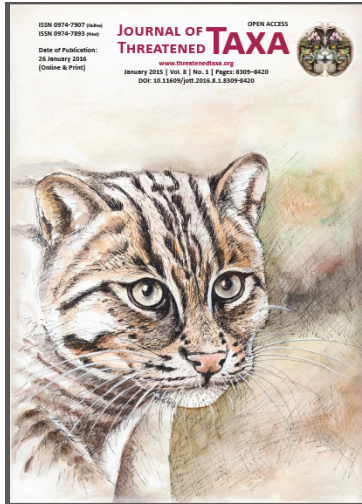


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AVIFAUNAL DIVERSITY IN ASSAM UNIVERSITY CAMPUS, SILCHAR, INDIA

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Abstract: We conducted a bird survey in the Assam University campus, Silchar from February 2011 to June 2011. A total of 73 species of birds belonging to 56 genera, 32 families and 13 orders was recorded. Significantly, the highest number of bird species restricted to only one particular habitat (17 species) was recorded in the forest area called 'eco-forest' ($\chi^2=18$, $df=3$, $P<0.01$). The highest similarity of bird species was found between degraded area and secondary growth area, and the lowest was found between eco-forest and degraded area. Species richness and dominance of species were more in the eco-forest area. The diversity of species was more in the secondary growth area. Red-vented Bulbul, Spotted Dove and Red-whiskered Bulbul were the most abundant and frequent bird species found in campus. The avifaunal diversity in the study area shows the importance of the University campus as an ideal bird habitat.

Keywords: Assam University, bird, degraded forest, dominance, species diversity, species richness.

The Indian subcontinent has 1340 bird species (Ali & Ripley 1987; Manakadan & Pittie 2001) which is over 13% of the world's birds. In Assam, more than 900 species and subspecies of birds belonging to 20 orders have been recorded (Choudhury 2000). A few studies on the terrestrial bird community have been done in the Barak Valley in the southern part of Assam (Hume 1877, 1880, 1888; Baker 1894–1901; Inglis 1896–1910), which contained lists of birds. Of late, Deb & Gupta

(2010) analysed avian communities in fragmented landscapes of Cachar District, Assam. A checklist of 113 species of birds in Assam University, Silchar campus and its adjoining area is available in Dutta et al. (2008). In addition to the university campus, they recorded birds in quite diverse habitats including "nearby tea gardens, grassy meadows, scrub jungles, open forest, relatively dense forest, hills, paddy fields, agricultural lands, stream banks, bamboo groves, horticultural gardens near villages". However, they did not do a comparative study of avifauna in different habitats. Bird diversity is influenced by habitat heterogeneity (MacArthur & MacArthur 1961). Change in structural and compositional diversity of native vegetation would alter the composition of the bird community (Fleishman et al. 1990; Leito et al. 2006; Acevedo & Aide 2008). Each habitat has its own characteristics with regard to avifauna composition (Manhaes & Loures-Ribeiro 2005), and several studies have established that the structural characteristics of the habitat influence bird diversity in general, and specific habitat preference in particular.

We studied avian diversity in different habitats of the Assam University, Silchar campus. We took the university campus as a model for studying birds in heterogeneous

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habitats. Similar work has also been done at the Federal University of Juiz de Fora, Brazil (Manhaes & Loures-Ribeiro 2005). We investigated the avifaunal diversity in different habitats in the same landscape.

Study Area

The study was carried out in Assam University, Silchar (AUS) campus (24°41'N & 92°41'E), located in Cachar District of Assam (Fig. 1). The University campus is spread over an area of about 600 acres and is surrounded by several small hillocks, natural lakes, tea gardens and agricultural lands (Dutta et al. 2008). The area experiences a warm, humid climate having a mean annual rainfall of 2660mm, most of which is received from May to September. The temperature ranges from 11°C (January) to 32.6°C (August).

We selected four distinct habitats within the university campus to compare the avifauna (Fig. 2). We named them gorge, eco-forest, degraded area and secondary growth area.

The gorge is characterized by a narrow deep strip of 1km flanked by two perpendicular hilly slopes. It has small temporary streams, and puddles, mainly fed by rain water. The vegetation is dominated by herbs and shrubs such as *Clerodendron viscosum*, *Cassia alata*, *Lantana camara*, *Combretum* sp. and *Crotalaria juncea*, with a few trees of *Artocarpus chama* scattered in the habitat.

The university campus has a forest patch, which is actually the remnant of a hill forest, which used to occur before the establishment of the campus. This is popularly known as the "eco-forest". One side of the forest is surrounded by the Silcoorie Tea Estate and the other side is bordered by paddy fields. The dominant tree species in this habitat are *Artocarpus chama*, *Tetrameles nudiflora*, *Ficus* sp. and *Artocarpus lakoocha*, and the undergrowth is dominated by *Schizostachyum dullooa*, *Mimosa himalayana*, saplings of *Goniothalamus* sp., *Cyclostemon* sp., *Desmodium trifolium*, saplings of *Calamus guruba*, *Daemonorops* sp., *Homalonema* sp., *Combretum* sp., *Cassia alata*, *Lantana camara* and seedlings of *Artocarpus chama* (Dutta et al. 2008). We recognized that the degraded area had a few small trees but it was dominated by shrub species like *Melastoma* sp., *Combretum* sp., and *Clerodendron viscosum*. The fourth habitat we selected was a secondary growth area, with regeneration of vegetation and some secondary vegetation. *Combretum* sp. and *Melastoma* sp. are the dominant shrub species found here. The area did not have any trees.

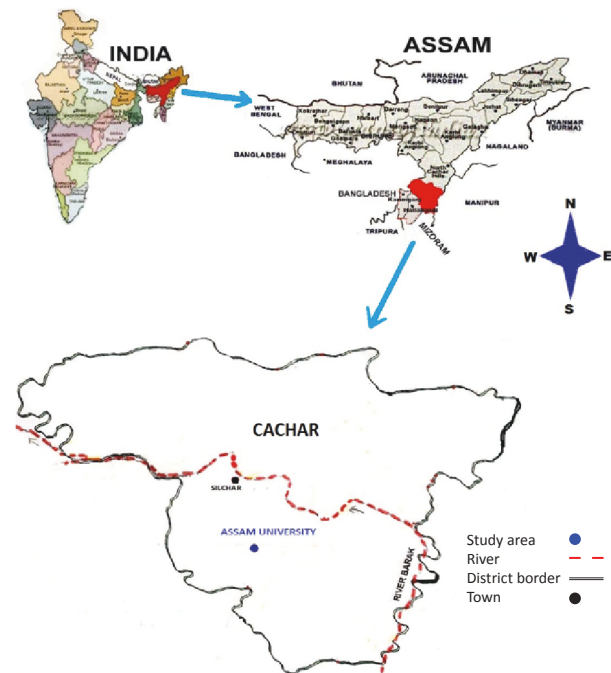


Figure 1. Location of the study area

METHODS

Data collection

The study was carried out from February 2011 to June 2011. A 350m-long trail in each habitat was followed until no addition of new species of birds to the cumulative number of species was confirmed. Thus each trail was walked 10 times during the study period. While walking at a constant pace along the trail, the species encountered within 30m on both sides of the trail were recorded. Birds flying overhead were excluded, and the birds that flew from behind the observers, were not recorded to avoid double count. The bird species were observed with a field binoculars (8×40) from 05:30 to 07:30 hr. and from 16:00 to 18:00 hr. Grimmett et al. (1999) was followed for the identification of birds; conspicuous bird calls were additionally used both for identification and recording birds. In addition to the fixed trails, opportunistic sightings of the birds were also recorded in other parts of the campus. The comprehensive checklist of the birds in the campus was prepared by adding these species with the species recorded on the fixed trails.

Data analyses

The cumulative number of species observed in each habitat was considered as the species richness for that habitat. A checklist of bird species found on the university campus was prepared following Manakadan &



Figure 2. Study area showing different habitats surveyed. Source: image@2011 GeoEye, Google Earth.

Pittie (2001) and Choudhury (2000). A list of bird species recorded in all the four habitats along with overall relative abundance and percentage of frequency of each species was calculated. The percentage of frequency for each species was calculated simply by dividing the number of days on which the species was observed by the total number of observation days multiplied by 100. Relative abundance for each species was calculated by dividing the total number of individuals of the species observed by the total number of individuals of all the species observed multiplied by 100.

We listed the bird species found particularly in each of the four specific habitats, i.e., for gorge, eco-forest, secondary growth area and degraded area separately, and then performed Chi-square test to see if the number of species was significantly different in those habitats. Shannon-Wiener index (Shannon & Weaver 1949) for bird species diversity, and also, dominance and evenness of bird species were calculated for each habitat using

PAST software (Hammer et al. 2001). To determine the association of species between two habitats, Sorensen's index of similarity (Sorensen 1948) was calculated as given below:

$$C_s = 2j / (a + b)$$

Where j = number of species common to both habitats.

a = number of species in habitat A

b = number of species in habitat B.

RESULTS

A total of 73 species of birds (Appendix 1) belonging to 56 genera, 32 families and 13 orders were recorded from Assam University campus. However, 53 species belonging to 44 genera, 28 families and 12 orders were encountered on the regular trails followed in the four different habitats in the campus. Out of these, six species were exclusively winter visitors, one was a migrant and

the remaining 66 species were residents, including occasional winter visitors and local and altitudinal migrants (see Choudhury 2000 for this classification).

The highest species richness was found in the eco-forest (36 spp. = 67.92%) and the lowest in the degraded area (19 spp. = 35.85%) (Figs. 3 & 4). However, the highest bird diversity was found in the secondary growth area and the lowest species diversity was recorded in the eco-forest (Table 1). The dominance of species was more in the eco-forest and lowest in the gorge. Equitability or evenness was highest in the degraded area followed by the secondary growth area. The dominance, Shannon index and evenness for bird community in the entire area covering all four habitat types were 0.106, 2.896 and 0.729, respectively (Table 1).

Among the four different habitats, six bird species were recorded only in the gorge, 17 species were recorded only in the eco-forest, two- and four species were recorded only in degraded area and secondary growth area, respectively; i.e., 29 species of birds (55%) were recorded from only one particular habitat type (Table 2). Significantly, the highest number of “birds found only in a particular habitat” (17 species = 57%) was recorded in the eco-forest ($\chi^2=18$, $df=3$, $P<0.01$) (Fig. 5). The highest similarity of bird species was found between the degraded area & the secondary growth area and the lowest was found between the eco-forest & the degraded area (Table 3).

The Red-vented Bulbul *Pycnonotus cafer*, the Spotted Dove *Streptopelia chinensis* and the Red-whiskered Bulbul *Pycnonotus jocosus* were the most abundant and frequent bird species (Table 4). Ten bird species were generalists, occurring in all habitat types recorded in the campus (Table 4).

DISCUSSION

The diversity of birds and distribution with respect to available habitat types represents the importance of the university campus as a suitable bird habitat. The university campus consists of a mosaic of habitats, which supports good diversity of birds. Habitat heterogeneity favours habitat specialist (through niche partitioning) birds with broad niches (Surasinghe et al. 2010).

In addition to 53 bird species in the regular trails, we recorded 20 more species in the university campus (Appendix 1), which we encountered occasionally, through opportunistic sightings. To prepare a checklist of bird species, opportunistic records are also required in addition to regular trail surveys.

The overall Shannon diversity index (2.90) in the Assam University campus was high. The habitat

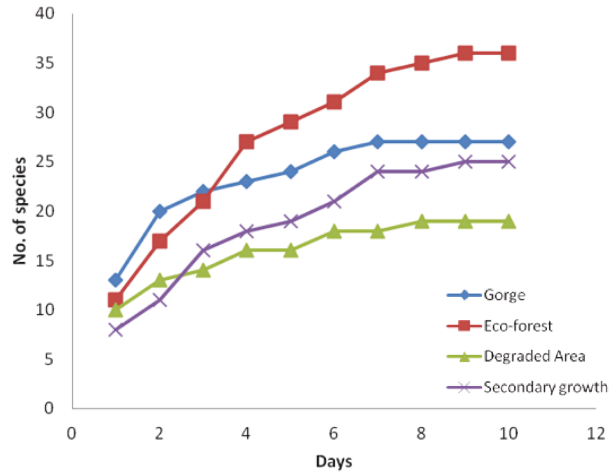


Figure 3. Species accumulation curve for avian communities in four different habitats surveyed.

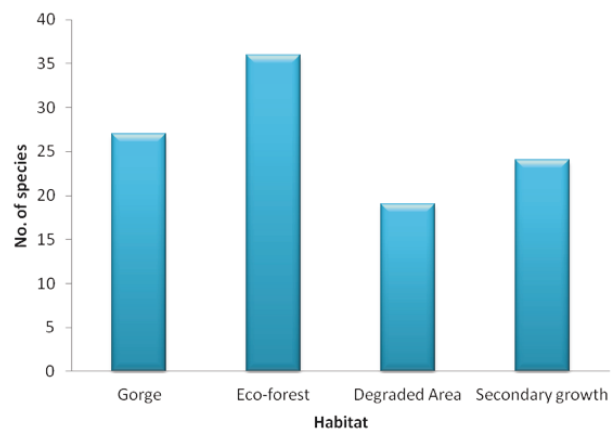


Figure 4. Number of bird species recorded in different habitats in the Assam University, Silchar campus during 2011.

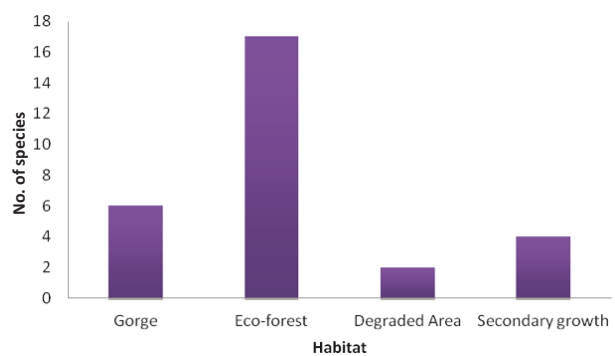


Figure 5. Number of bird species found particularly in one habitat type.

heterogeneity hypothesis proposes that an increase in the number of habitats leads to an increase in species diversity in a landscape (MacArthur & MacArthur 1961)

Table 1. Dominance and Diversity indices of avian communities in different habitats.

Index	Gorge	Eco-forest	Degraded area	Secondary growth	Overall
Dominance	0.120	0.156	0.097	0.107	0.106
Shannon index	2.558	2.529	2.573	2.594	2.896
Equitability or evenness	0.776	0.706	0.874	0.816	0.729

Table 2. Bird species recorded only in one particular habitat type in the Assam University, Silchar campus during 2011.

Gorge	Eco-forest	Degraded area	Secondary growth
Cattle Egret Small Blue Kingfisher Indian Pond-Heron Common Snipe White-breasted Waterhen Grey-backed Shrike	Golden-fronted Leafbird Common Hoopoe Fulvous-breasted Pied Woodpecker Coppersmith Barbet Hodgson’s Scimitar-Babbler Scarlet-backed Flowerpecker Alexandrine Parakeet Black-naped Green Woodpecker Crimson Sunbird Large Cuckoo-Shrike Indian Roller Yellow-legged Green-Pigeon Black-headed Oriole Kaleej Pheasant Large Yellow-naped Woodpecker Red-breasted Parakeet Common Hill-Myna	Spotted Munia House Sparrow	Chestnut-headed Bee-eater Emerald Dove Pied Harrier Spotted Owlet

Table 3. Similarity between different habitats in terms of bird species occurrence.

Sorensen's Index	Habitat					
	Gorge & Eco-forest	Eco-forest & Degraded area	Degraded area & Secondary growth	Gorge & Degraded area	Gorge & Secondary growth	Eco-forest & Secondary growth
	0.476	0.436	0.941	0.696	0.731	0.567

because of an expansion in the number of partitionable niche dimensions (Cramer & Willig 2005). However, the Shannon diversity index in four studied habitats differed very little. The secondary growth area had the highest diversity index of 2.60. In a similar study in different habitats in tropical deciduous forest, the Shannon diversity index ranged from 2.84 to 3.76 with species richness varying from 39 to 75 (Ramírez-Albores 2007). Johnsingh & Joshua (1994) found bird species diversity index 3.04 in dry deciduous forest, while 2.83 in secondary vegetation in Mundanthurai Plateau, southern India. In our study, the overall species richness was 53 in the regular trails. Though the highest number of species was recorded in the eco-forest area, because of the dominance of Red-vented Bulbul, the Shannon-Wiener’s Index was less than that of the secondary growth area. Tvardíková (2010) found no difference in the abundance of birds, but differences in the diversity between primary and secondary forests (see Dunn 2004 also for review).

The eco-forest area with comparatively more trees was rich in bird species. More than half of all the species recorded in this area were confined to this particular habitat. The presence of trees with understory vegetation in this area provided food resources, breeding habitat and cover for the birds. Dense under-storey vegetation provides a good habitat for bush birds. This area looked to be a suitable nesting habitat for several bird species. The Common Hill-Myna *Gracula religiosa*, Red-breasted Parakeet *Psittacula alexandri*, Rose-ringed Parakeet *Psittacula krameri*, Blue-throated Barbet *Megalaima asiatica*, Coppersmith Barbet *Megalaima haemacephala* are some of the birds species that have been seen to make nests in tree-holes. This habitat supports 17 bird species which were not found in the other three habitats, which is because of its vegetation complexity.

The secondary vegetation, especially if it is heavily disturbed, has fewer forest specialist bird species and more of the widespread generalist species (Terborgh & Weske 1969; Beehler et al. 1987). Although the

Table 4. The relative abundance and frequency of each species and its occurrence in four habitats.

	Species	Habitat				Rel. Abundance (%)	Frequency (%)
		Gorge	Eco-forest	Degraded area	Secondary growth		
1	Red-vented Bulbul	+	+	+	+	27.6	100.0
2	Spotted Dove	+	+	+	+	9.1	90.0
3	Red-whiskered Bulbul	+	+	+	+	7.5	80.0
4	Common Myna	+	+	+	+	4.3	60.0
5	Brown-flanked Bush-Warbler	+	+	+	+	4.4	60.0
6	Oriental Magpie-Robin	+	-	+	+	3.0	57.5
7	Rufous-necked Laughingthrush	+	-	+	+	5.8	45.0
8	Black Drongo	+	+	+	+	2.0	42.5
9	Jungle Crow	+	+	+	+	3.7	42.5
10	Asian Pied Starling	+	-	+	+	3.2	37.5
11	Jungle Myna	+	-	+	+	2.7	37.5
12	Blue-throated Barbet	+	+	+	-	1.5	32.5
13	Rose-ringed Parakeet	+	+	-	-	2.8	30.0
14	Common Tailorbird	+	+	+	+	1.5	30.0
15	Greater Coucal	+	+	-	+	1.3	30.0
16	Rufous-backed Shrike	+	-	+	+	0.8	25.0
17	Striated Babbler	-	+	-	+	2.8	22.5
18	Common Hill-Myna	-	+	-	-	2.1	22.5
19	House Sparrow	-	-	+	-	1.7	22.5
20	White-throated Kingfisher	+	+	+	+	0.7	20.0
21	Red-breasted Parakeet	-	+	-	-	2.2	17.5
22	Chestnut-headed Bee-eater	-	-	-	+	0.9	17.5
23	Asian Koel	+	+	+	+	0.6	17.5
24	White-rumped Munia	+	+	-	+	2.4	15.0
25	Common Snipe	+	-	-	-	0.4	10.0
26	Spotted Owlet	-	-	-	+	0.3	10.0
27	Bronze Drongo	+	+	-	+	0.3	10.0
28	Grey-backed Shrike	+	-	-	-	0.2	7.5
29	White-breasted Waterhen	+	-	-	-	0.3	7.5
30	Red Junglefowl	+	-	-	+	0.2	7.5
31	Pied Harrier	-	-	-	+	0.4	7.5
32	Large Yellow-naped Woodpecker	-	+	-	-	0.3	5.0
33	Grey-headed Starling	-	+	+	+	0.6	5.0
34	Large Cuckoo-Shrike	-	+	-	-	0.2	5.0
35	Black-naped Green Woodpecker	-	+	-	-	0.2	5.0
36	Common Iora	-	+	-	-	0.1	2.5
37	Indian Pond-Heron	+	-	-	-	0.1	2.5
38	Small Blue Kingfisher	+	-	-	-	0.1	2.5
39	Kaleej Pheasant	-	+	-	-	0.1	2.5
40	Black-headed Oriole	-	+	-	-	0.2	2.5
41	Yellow-legged Green-Pigeon	-	+	-	-	0.2	2.5
42	Indian Roller	-	+	-	-	0.2	2.5
43	Emerald Dove	-	-	-	+	0.1	2.5

	Species	Habitat				Rel. Abundance (%)	Frequency (%)
		Gorge	Eco-forest	Degraded area	Secondary growth		
44	Crimson Sunbird	-	+	-	-	0.1	2.5
45	Alexandrine Parakeet	-	+	-	-	0.1	2.5
46	Scarlet-backed Flowerpecker	-	+	-	-	0.1	2.5
47	Hodgson's Scimitar-Babbler	-	+	-	-	0.1	2.5
48	Spotted Munia	-	-	+	-	0.1	2.5
49	Coppersmith Barbet	-	+	-	-	0.1	2.5
50	Cattle Egret	+	-	-	-	0.1	2.5
51	Fulvous-breasted Pied Woodpecker	-	+	-	-	0.1	2.5
52	Common Hoopoe	-	+	-	-	0.1	2.5
53	Gold-fronted Chloropsis	-	+	-	-	0.1	2.5

+ = present; - = absent;

secondary growth area of the campus is located nearby a forest, several of the forest-dependent birds were either rare or absent in the secondary growth area. Notable among these were the Common Hill-Myna, Common Iora *Aegithina tiphia*, Alexandrine Parakeet *Psittacula eupatria*, Fulvous-breasted Pied Woodpecker *Dendrocopos macei*, Black-naped Green Woodpecker *Picus canus* and Large Yellow-naped Woodpecker *Picus flavinucha*. Common Myna *Acridotheres tristis*, Black Drongo *Dicrurus macrocercus*, Red-vented Bulbul, Red-whiskered Bulbul, Spotted Dove, Asian Koel *Eudynamis scolopacea*, Brown-flanked Bush-warbler *Cettia fortipes*, White-breasted Kingfisher *Halcyon smyrnensis*, Jungle Crow *Corvus macrorhynchos* and Common Tailorbird *Orthotomus sutorius* were the generalist bird species recorded in all the four habitats. Eighteen bird species were sighted only once or twice in the study period, 13 of them were sighted in the eco-forest region. These species might be occasional visitors. Rice et al. (1983) found that species with restricted distributions were habitat specialists, whereas species with broad distributions can be either habitat generalists or specialists.

The Gorge area consisting of some temporary streams and pools supported some water bird species, which were restricted to this habitat only. The Degraded area, on the other hand, had mostly generalist bird species and some urban birds such as House Sparrow *Passer domesticus*, Spotted Munia *Lonchura punctulata*, etc.

Species diversity in the Secondary growth area was more as the bird species present there were mostly generalist species and the individuals were evenly distributed. Johnsingh & Joshua (1994) also found fewer

specialized forest species in secondary vegetation and more generalists. Deb & Gupta (2010) had recorded more species diversity in secondary growth landscape than degraded forest. They also stated that patch quality is an important governing factor limiting occurrence and distribution of sensitive species. Species composition of the vegetation is very important to habitat selection by birds (Rice et al. 1983). However, Johnsingh & Joshua (1994) could not find any relationship between bird species diversity and tree species diversity. Rai (1991) concluded that bird species richness was highest in the floristically rich habitat types. However, Daniels (1989) found increased bird diversity in disturbed forest. Our study area represented at least four different patchy habitats, which provides an overall mosaic kind of habitat for rich avian diversity. The highest similarity of bird species (94%) was found between the degraded area and secondary growth area. Johnsingh & Joshua (1994) found 52% similarity in bird species between secondary vegetation and dry deciduous forest. Our result of similarity index between eco-forest and secondary growth area (56%) is similar to their study. Both the degraded area and secondary growth area had less vegetation, devoid of trees, and thus have a similar look. Mostly generalist bird species were found in these habitats.

The Assam University, Silchar campus is a remnant of forested area having mosaic kinds of landscape, which provide different habitats for the diverse communities of birds. We recorded some migratory species which are rarely found in this region. The presence of both generalist as well as habitat specialist bird species in the same landscape may lead to many research questions. A study on comparative ecology between these two

communities could be done. On the basis of abundance, resource partition between congeneric species like Red-vented Bulbul and Red-whiskered Bulbul, Red-breasted Parakeet and Rose-ringed Parakeet, House Sparrow and Eurasian Tree Sparrow, etc., could also be studied. There is also scope to study least known species, e.g., Rufous-necked Laughingthrush, which is otherwise not easily found in the Barak Valley. Long term nest monitoring of the House Sparrow and Eurasian Tree Sparrow is one of the options for future research. Because of secondary succession in some areas is going on, it will be interesting to continue the field research in later years to see the change in bird community there. However, due to developmental activities in the campus in the form of construction of buildings, some parts of the campus have acquired the form of a semi-urban habitat (Singha et al. 2011), which provides a good habitat for some urban species (e.g., House Sparrow, Tree Sparrow) as well. They recorded 157 nests belonging to five species of birds in the AUS campus. It is proposed, however that habitat heterogeneity should be maintained for the conservation of species richness in habitats threatened by human activities (McGarigal & McComb 1992; Greenberg et al. 1995). Therefore, considering the rich avian species diversity in heterogenous habitats in the AUS campus, the remnant forest area should be kept out of developmental activities. Our study has revealed that due to heterogenous habitats within its campus area, Assam University, Silchar holds a high avian diversity. Therefore, developmental activities like building constructions could be restricted to some places, and particularly the eco-forest area and gorge should remain as they are.

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Appendix 1. Checklist of birds found in the Assam University, Silchar campus during 2011. Classification of birds is after Manakadan & Pittie (2001).

Common name	Scientific name	Residential status
Ciconiiformes: Ardeidae		
1. Indian Pond-Heron	<i>Ardeola grayii</i>	R
2. Cattle Egret	<i>Bubulcus ibis</i>	R
3. Median Egret	<i>Mesophoyx intermedia</i>	R
Ciconiidae		
4. Asian Openbill-Stork	<i>Anastomus oscitans</i>	R
Falconiformes: Accipitridae		
5. Pied Harrier	<i>Circus melanoleucos</i>	M, W
6. Crested Serpent-Eagle	<i>Spilornis cheela</i>	R
Galliformes: Phasianidae		
7. Red Junglefowl	<i>Gallus gallus</i>	R
8. Kaleej Pheasant	<i>Lophura leucomelanos</i>	R
Gruiformes: Rallidae		
9. White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	R
Charadriiformes: Scolopacidae		
10. Common Snipe	<i>Gallinago gallinago</i>	W
Columbiformes: Columbidae		
11. Emerald Dove	<i>Chalcophaps indica</i>	R
12. Spotted Dove	<i>Streptopelia chinensis</i>	R
13. Yellow-legged Green-Pigeon	<i>Treron phoenicoptera</i>	R
Psittaciformes: Psittacidae		
14. Red-breasted Parakeet	<i>Psittacula alexandri</i>	R
15. Rose-ringed Parakeet	<i>Psittacula krameri</i>	R
16. Alexandrine Parakeet	<i>Psittacula eupatria</i>	R
Cuculiformes: Cuculidae		
17. Greater Coucal	<i>Centropus sinensis</i>	R
18. Asian Koel	<i>Eudynamis scolopacea</i>	R, L
Strigiformes: Strigidae		
19. Spotted Owlet	<i>Athene brama</i>	R
20. Brown Fish-Owl	<i>Ketupa zeylonensis</i>	R
Strigidae		
21. Brown Hawk-Owl	<i>Ninox scutulata</i>	R
Apodiformes: Apodidae		
22. House Swift	<i>Apus affinis</i>	R, L
Coraciiformes: Alcedinidae		
23. Small Blue Kingfisher	<i>Alcedo atthis</i>	R

Common name	Scientific name	Residential status
24. White-breasted Kingfisher	<i>Halcyon Smyrnenis</i>	R
Meropidae		
25. Chestnut-headed Bee-eater	<i>Merops leschenaulti</i>	R
Coraciidae		
26. Indian Roller	<i>Coracias benghalensis</i>	R, L
Upupidae		
27. Common Hoopoe	<i>Upupa epops</i>	R, W, L
Piciformes: Capidonidae		
28. Blue-throated Barbet	<i>Megalaima asiatica</i>	R
29. Lineated Barbet	<i>Megalaima lineata</i>	R
30. Coppersmith Barbet	<i>Megalaima haemacephala</i>	R
Picidae		
31. Eurasian Wryneck	<i>Jynx torquilla</i>	W
32. Large Yellow-naped Woodpecker	<i>Picus flavinucha</i>	R
33. Black-naped Green Woodpecker	<i>Picus canus</i>	R
34. Fulvous-breasted Pied Woodpecker	<i>Dendrocopos macei</i>	R
Passeriformes: Laniidae		
35. Rufous-backed Shrike	<i>Lanius schach</i>	R, W
36. Grey-backed Shrike	<i>Lanius tephronotus</i>	W
Oriolidae		
37. Black-headed Oriole	<i>Oriolus xanthornus</i>	R
Dicruridae		
38. Bronzed Drongo	<i>Dicrurus aeneus</i>	R
39. Black Drongo	<i>Dicrurus macrocercus</i>	R
40. Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>	R
Artamidae		
41. Ashy Woodswallow	<i>Artamus fuscus</i>	R
Sturnidae		
42. Common Myna	<i>Acridotheres tristis</i>	R
43. Asian Pied Starling	<i>Sturnus contra</i>	R
44. Jungle Myna	<i>Acridotheres fuscus</i>	R
45. Common Hill-Myna	<i>Gracula religiosa</i>	R
46. Grey-headed Starling	<i>Sturnus malabaricus</i>	R
Corvidae		
47. House Crow	<i>Corvus splendens</i>	R

Common name	Scientific name	Residential status
48. Jungle Crow	<i>Corvus macrorhynchos</i>	R
49. Indian Treepie	<i>Dendrocitta vagabunda</i>	R
Campephagidae		
50. Large Cuckoo-Shrike	<i>Coracina macei</i>	R
Irenidae		
51. Common Iora	<i>Aegithina tiphia</i>	R
52. Gold-fronted Chloropsis	<i>Chloropsis aurifrons</i>	R
Pycnonotidae		
53. Red-vented Bulbul	<i>Pycnonotus cafer</i>	R
54. Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	R
55. Black-crested Bulbul	<i>Pycnonotus melanicterus</i>	R
Muscicapidae		
56. Brown-flanked Bush-Warbler	<i>Cettia fortipes</i>	R
57. Hodgson's Scimitar-Babbler	<i>Pomatorhinus schisticeps</i>	R
58. Striated Babbler	<i>Turdoides earlei</i>	R
59. Rufous-necked Laughingthrush	<i>Garrulax ruficollis</i>	R
60. Common Tailorbird	<i>Orthotomus sutorius</i>	R

Common name	Scientific name	Residential status
61. Black-necked Tailorbird	<i>Orthotomus atrogularis</i>	R
62. Siberian Rubythroat	<i>Luscinia calliope</i>	W
63. Oriental Magpie-Robin	<i>Copsychus saularis</i>	R
64. White-rumped Shama	<i>Copsychus malabaricus</i>	R
65. Blue-fronted Redstart	<i>Phoenicurus frontalis</i>	W
66. Blue Rock-Thrush	<i>Monticola solitarius</i>	W
Dicaeidae		
67. Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>	R
Nectariniidae		
68. Purple Sunbird	<i>Nectarinia asiatica</i>	R
69. Crimson Sunbird	<i>Aethopyga siparaja</i>	R, L
Passeridae		
70. House Sparrow	<i>Passer domesticus</i>	R
71. Eurasian Tree Sparrow	<i>Passer montanus</i>	R
Estrildidae		
72. White-rumped Munia	<i>Lonchura striata</i>	R
73. Spotted Munia	<i>Lonchura punctulata</i>	R

R - Resident; L - Local and altitudinal migrant; W - Winter visitor; M - Migrant, but some breed here (Choudhury 2000).





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