Wildlife Inventory of the University of the Philippines (UP) Diliman and the Ateneo de Manila University Campus Diliman, Quezon City, Luzon, Philippines

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ABSTRACT

An inventory of the terrestrial vertebrate species of wildlife on the campuses of the University of the Philippines (UP) Diliman and the Ateneo de Manila University in Quezon City, Metro Manila, was conducted between October 1997 through August 1998. The land area of the UP Diliman campus is 493 hectares while that of the Ateneo de Manila University campus is 83 hectares.

A total of 76 vertebrate species was recorded in the campuses of UP Diliman and Ateneo de Manila University. This diverse assemblage of wildlife in the study sites consists of 6 species of amphibians (1 endemic), 13 species of reptiles (2 endemic), 47 species of birds (7 endemic) and 10 species of mammals (1 endemic).

More than 61% of wildlife species found in the study areas were birds. Historical records of the assemblage of bird species in the UP Diliman area and its environs indicate that six species of birds used to be found in the study sites, are now no longer present.

Key words: biodiversity, UP Diliman, Ateneo de Manila, local extinction, endemic

INTRODUCTION

In the Philippines, 1,094 species of amphibians, reptiles, birds, and mammals comprise the terrestrial wildlife vertebrate species. Of these, more than 47% (512 species) are endemic or found nowhere else in the planet. New species from each taxa have been reported almost every year since the early 1980s (Alcala & Brown, 1998; Gonzalez, 1997; Heaney et al., 1998; and Dickinson et al., 1991).

The majority of Philippine terrestrial wildlife species are forest dependent. Forested areas, however, are fast disappearing as a result of different human activities. Estimates made by the Forest Management Bureau in 1988 show that forest cover in the Philippines is between 64,606 km^2 to 70,226 km^2, i.e., 21.5% to 23.4% of the total land area in the Philippines. Three years later, it was reduced to 60,100 km^2 (FMB, 1991). In a span of 39 years (1948-1987), forest cover decreased from 50% to 21% (Kummer & Turner, 1994 as cited in SEAMEO-SEARCA 1997).

This is an attempt to document for the first time the terrestrial wildlife vertebrate species on the UP Diliman campus. Studies such as this are important in the

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identification of species that are highly tolerant and sensitive to natural and man-made changes.

MATERIALS AND METHODS

Sampling Techniques

Herpetofauna

Opportunistic Catching

Amphibians and reptiles were captured primarily using bare hands. Opportunistic catching was made by checking a variety of possible habitats (i.e., tree trunks, tree holes, root tangles, water tributaries, and small ponds).

Standard measurements were taken and the specimens released, unless voucher samples were needed for further identification. For amphibians, measurements taken were snout-vent length (SVL), head breadth (HB), and hind limb length (HLL). For reptiles, snout-vent length (SVL), tail length (TaL), head breadth (HB), and total length (TL) were measured.

Avifauna

Nested Plot Technique

Strategic observation points (i.e., near possible roosting areas, near feeding trees, etc.) were selected and established. An observer visited and stayed at the established points when birds are most active for a period of 30 minutes to 1 hour. A maximum of 4 points were covered within a period of 1 day. Whenever birds were observed, the following information were noted: name (species), number of individuals, microhabitat, and others (flying, perched, heard, foraging, etc.).

Mist Netting

Netting was accomplished using 35 mm monofilament mist nets (12 m length and 2 m width). Nets were hoisted along possible flight paths of birds (i.e., between trees, on the ground with approximately 30 cm clearance, etc.). Since vegetation within the UP campus is not that extensive, the number of nets used were reduced to 3 and operated for 3 consecutive days. Netting was reduced because it attracted the attention and curiosity ofthe people around the sites. The presence of the people negatively affected the rate of capture (for instance, some of the birds were removed by the passers-by.

For each captured individual, descriptions of plumage and soft parts were taken together with standard biometric measurements, namely, bill length (BL), tail length (TL), forearm length (FL), hind foot or tarsus (HF), and weight. Unless voucher specimens were needed for further identification, all the birds captured were released immediately .

Bio-acoustics and Photo-documentation

To supplement the identification of observed bird species, recording of birdcall and photo-documentation were conducted. Using the nested plot sites, an observer recorded calls or sounds encountered. A stereo cassette recorder equipped with a headphone and a microphone capable of 50 to 20,000 Hz +/- 2.5 db frequency response and with supercardioid/lobe pick-up pattern was used in the study. Since birds are most active during the early morning and late afternoon, recordings were performed during these time periods. When a certain unfamiliar call/s was/were recorded and the researcher had difficulties identifying this species, authorities on birdcalls were consulted.

A spotting scope with lenses capable of 20x, 40x, and 60x magnification was used. It was also attached to a camera; thus, whenever possible, birds observed were photographed.

Mammals

Mist Netting of Bats

Mist nets used for birds were also utilized for catching bats. Operation was for a maximum of 4 consecutive nights. It was tended for 2 to 4 hours after sunset and checked at intervals of 1 to 2 hours afterwards.

Standard biometric parameters of captured bats were measured and recorded. These include forearm length (FL), hindfoot (HF), ear length (EL), head and body length (HBL), total length (TL), and weight. Unless there was need for voucher specimens, all captured bats were released.

Trapping of Small Non-volant Mammals

Due to very limited possible habitat and microhabitats within the study area and problems encountered with local residents and/or passers-by; the traps used were limited to snap traps. Live traps and possible live catch aroused the curiosity of people around the area. These people ended up interfering with the sampling.

A maximum of 10 traps was set per site. Bait used was either roasted coconut meat mixed with peanut butter or live earthworm. They were placed in areas where small mammals might be present (i.e., along possible runways, near holes or among root tangles, and fallen logs). Checking and rebaiting were made immediately after dawn and in the late afternoon.

All captured individuals were measured and collected. Those individuals captured alive and whose identities were ascertained were released after standard measurements were taken. Measurements taken were tail vent (TV), hind-foot (HF), head and body length (HBL), total length (TL), and weight.

RESULTS

Herpetofauna

A total of 19 species of amphibians and reptiles under 8 families were identified. Six species of amphibians under 2 families were noted while 13 species under 6 families of reptiles were observed.

UP Diliman Campus

Identified herpetofauna of UP Diliman consists of 15 species under 6 families (Table 1). The reptilian families observed are Gekkonidae, Scincidae, Elapidae, and Colubridae. The other 2 are amphibian families (Bufonidae and Ranidae).

Family Bufonidae has one representative, the Giant South American toad (*Bufo marinus*) which was observed in all the sites. Its occurrence can be described as abundant to common.

For Family Ranidae, 5 species were identified (*Rana erythraea, R. magna, Haplobatrachus rugulosus, Polypedates leucomystax,* and *Occidozyga laevis*). *R. erythraea* was captured from the arboretum and the lagoon-Beta Way areas while 3 individuals were observed in Ikapati farm. *R. magna* and *H. rugulosus* were observed and recorded only from the arboretum. *P. leucomystax* was present in all the sites except in Public Administration. *O. laevis* was the only species noted in all the sites. Its occurrence can be described as abundant.

Under family Gekkonidae, 5 species were identified (*Gekko gecko, Hemidactylus frenatus, H. stejnegeri, Hemidactylus sp.*, and *Cosymbotus platyurus*). No specimen of *Tokay gecko* (*G. gecko*) was collected but its familiar and distinct call was noted in the arboretum. Three specimens of the common house gecko (*H. frenatus*) were collected from the arboretum. Specimens of Stejnegers's hemidactylid gecko (*H. stejnegeri*) were collected from Public Administration and the arboretum. No specimen of *Hemidactylus sp.* was collected but its presence was observed in all the sites. A single specimen of flat-bodied gecko (*C. platyurus*) was collected from the Institute of Biology building.

Common mabouya (*Mabuya multifasciata*) and *Sphenomorphus sp.* are 2 skink species that were noted. Common mabouya was observed in 4 sites. *Sphenomorphus sp.* has a more limited distribution. Its presence was observed only once in Public Administration.

Naja philippinensis (Philippine common cobra) of family Elapidae was recorded once from the University of the Philippines Integrated School (UPIS). Although no specimen was collected, its presence was known through a molted skin. All members of family Elapidae in the Philippines possess deadly venom. Another

Table 1. List of recorded herpetofauna from the UP Diliman Campus

Scientific Name	Sampling Site 1	Sampling Site 2	Sampling Site 3	Sampling Site 4	Sampling Site 5	Sampling Site 6	Total
Class Reptilia							
Family Gekkonidae							
1. *Gekko gecko*	-	-	-	6(H)	-	-	6(H)
2. *Hemidactylus frenatus*	-	-	-	3(C)	-	-	3(C)
3. *Hemidactylus stejnegeri*	4(C)			3(C)			7(C)
4. *Hemidactylus sp.*	*(V)	*(V)	*(V)	*(V)	*(V)	*(V)	
5. *Cosymbotus platyrus*	-	-	1(V)	-	-	-	1(V)
Family Scincidae							
6. *Mabuya mutifasciata*	5(V)	-	-	6(V)	12(V)	7(V)	30(V)
7. *Sphenomorphus sp.*	1(V)	-	-	-	-	-	1(V)
Family Elapidae							
8. *Naja philippinensis*	-	1(V)	-	-	-	-	1(V)
Family Colubridae							
9. *Rhabdophis spilogaster*	1(C)	-	-	-	-	-	1(C)
Class Amphibia							
Family Bufonidae							
10. *Bufo marinus*	*(V)	*(V)	*(V)	*(V)	*(V)	*(V)	
Family Ranidae							
11. *Rana eryhtraea*	-	-	-	1(C)	1(C)	3(S)	2 (C), 3(S)
12. *Rana magna*	-	-	-	1(C)	-	-	1(C)
13. *Haplobatracus rugulosus*		1(C)	2(C)	1(C), 1(V)	-	-	1(C), 1(S)
14. *Polypedates leucomystax*				3(C)	2(C), 1(V)	2(C)	9(C), 1(V)
15. *Occidozyga laevis*	*(V)	*(V)	*(V)	*(V)	*(V), 5(C)	*(V)	5(C)

Legend:
Sampling Site 1 - Public Administration
Sampling Site 2 - University of the Philippines Integrated School
Sampling Site 3 - Executive House Premises
Sampling Site 4 - Arboretum area
Sampling Site 5 - Lagoon-Beta Way area
Sampling Site 6 - Ikapati Farm
C - Captured
H - Heard
V - Visual
* - Abundant

species of snake, *Rhabdophis spilogaster* (Northern water snake) of family Colubridae was collected from Public Administration. This is a non-venomous snake.

Ateneo de Manila University Campus

A total of 9 species of amphibians and reptiles under 7 families were identified (Table 2). Six species are under 5 reptilian families (Emydidae, Gekkonidae, Scincidae, Colubridae, and Varanidae). The remaining 3 belong to 2 amphibian families (Bufonidae and Ranidae).

B. marinus (Giant South American toad) of family Bufonidae was observed and recorded in all the sites. Like in UP Diliman, *B. marinus* is also abundant in the Ateneo de Manila.

Only 2 species (*R. erythraea* and *H. rugulosus*) from family Ranidae were observed. Both were noted in a man-made pond within the college baseball and football field. *R. erythraea* is abundant (more than 20 individuals encountered) while *H. rugolosus* is uncommon (less than 2 individuals encountered).

One species of fresh water turtle, most likely *Cuora amboinensis,* was noted. But no photo-documentation or collected specimen was obtained. It was seen only once at around 1730 to 1800 h on 28 July 1998.

Carapace of the said turtle is approximately 15 to 20 cm in length while width is 8 to 10 cm.

Two species from family Gekkonidae were identified (*G. gecko* and *Gehyra mutilata*). *G. gecko* was recorded from the vicinity of the Jesuit Residence. Although no specimen was collected, its presence was confirmed by its unique and distinct call. *G. mutilata* was confirmed present by a single specimen collected from the Urban Food Center. The specimen was an adult female.

Common mabouya (*M.multifasciata*) was recorded in all the sites. It is abundant in the study area. Encounters were usually made in the morning from 0700 to 0900 h. This skink is easily identified through its color (light golden brown) and relative sizes (18-24 cm).

Table. 2 List of observed herpetofauna from the Ateneo de Manila Campus

Scientific Name	Sampling Site 1	Sampling Site 2	Sampling Site 3	Total
Class Reptilia				
Family Emydidae				
1. *Cuora amboinensis*		V(1)		V(1)
Family Gekkonidae				
2. *Gekko gecko*	2(H)			2(H)
3. *Gehyra mutilata*			1(C)	1(C)
Family Scincidae				
4. *Mabuya multifasciata*	5(V)*	4(V)*	5(V)*	14(V)*
Family Colubridae				
5. *Lycodon aulicus*			1(I)	1(I)
Family Varanidae				
6. *Varanus salvator*	1(V)			1(V)
Class Amphibia				
Family Bufonidae				
7. *Bufo marinus*	V*	V*	V*	V*
Family Ranidae				
8. *Rana erythraea*		10(V)		10(V)
9. *Haplobatrachus rugulosus*		2(V)		2(V)

Legend: Sampling Site 1 - Jesuit Residence, J.P. Renewal Center, Cervini and Eliazo Hall, and portion of Loyola House of Studies
Sampling Site 2 - College Football and Baseball Field
Sampling Site 3 - Urban Food Center (Ateneo Sweet Corn)

V - Visual C - Collected
H - Heard I - Interview

Neither index of presence (i.e., molted skin, body remains, etc.) nor actual observation of any snake was encountered. But an interview with the farm workers of the Urban Food Center revealed that they once caught a snake within the area. They described it as being black in color with some white to gray patches or markings, moderate body build (diameter around the size of an index finger), 45 to 60 cm long, and in a coiled position upon discovery. It can be deduced that the captured snake was most likely *Lycodon aulicus* (Common wolf snake) of family Colubridae locally known as "ahas tulog." This species is commonly encountered near or even inside man-made structures and houses.

Varanus salvator (Philippine monitor lizard) of family Varanidae was confirmed present based on interviews. One *Varanus salvator* was also accidentally caught in a man-made ditch at the back of Eliazo Hall. The individual caught was an adult about 90 to 120 cm long.

Avifauna

A total of 47 species of birds under 22 families were recorded. Although this survey is a combination of various techniques, all the species recorded were identified primarily through nested plot technique. Birds captured through mist netting were observed only in UP Diliman.

Of the 47 recorded birds, 35 (75%) are resident breeding organisms including 7 Philippine endemic, 4 (8%) are winter visitors, 2 (4%) are introduced species while the remaining 6 (13%) are with undetermined status since their identification is limited to the genus level.

Some of the most commonly encountered species were *Passer montanus*, *Pycnonotus goiavier*, *Lanius cristatus*, *L. schach*, *L. validirostris*, *Hirundo tahitica*, *Rhipidura javanica*, *Acridotheres cristatellus*, *Geopelia striata*, and *Orthotomus sp.*

At present, *L. validirostris* (Mountain shrike) is classified as a nearly threatened species, i.e., it does not qualify for any of the threatened categories such as critical, endangered, vulnerable, conservation dependent or data deficient, but is close to qualifying for the said categories (Collar et al., 1994).

UP Diliman Campus

Mist Netting

Mist netting of birds within UP Diliman was conducted in 7 sites from early October 1997 to late January 1998 with a follow-up fieldwork from June 8 to 19, 1998. A total of 50 net days were obtained.

Twelve individuals under 6 species (*L. cristatus*, *P. goiavier*, *L. schach*, *Phylloscopus cebuensis*, *Cacomantis variolosusm,* and *Halcyon coromanda*) were caught. *L. cristatus* was the most frequently captured with a total of 6 individuals (50% of the total catch).

Four of these netted species are resident breeders (*P. goiavier*, *L. schach*, *P. cebuensis* and *C. variolosus*) while 2 are winter visitors (*L. cristatus* and *H. coromanda*).

Nested Plot Technique and Bio-acoustics

A total of 20 man-hours were utilized in nested plot technique and bio-acoustics. Thirty-eight bird species under 20 families were observed and identified (Table 3), most of which are resident breeding organisms (26 or 68%) including 5 endemic species, 4 species (11%) are winter visitors, 2 species (5%) are introduced while the rest (6 or 16%) are with undetermined status since their identification is limited to the genus level.

Some of the commonly observed species are *P. montanus*, *L. cristatus*, *H. tahitica*, *P. goiavier*, *R. javanica*, *Orthotomus sp.*, *L. validirostris*, *L. schach*, *P. cebuensis,* and *Streptopelia chinensis*.

The nearly threatened *L. validirostris* was recorded in the Executive House premises, lagoon-Beta Way area, UPIS, and the Arboretum. It was among the 5 endemic species. It should also be noted that 15 species under 11 families were recorded only from UP Diliman.

Ateneo de Manila University Campus

Mist Netting

Netting of birds in Ateneo de Manila was limited to only 1 site. A total of 3 nets were operated for 3 consecutive days thereby accumulating a total of 9 net days, but no bird was captured.

Nested Plot Technique and Bio-acoustics

A total of 27 bird species under 17 families were recorded (Table 4). Fieldwork was conducted from July to mid-August 1998 with an accumulated total observation time of 12 man hours.

Birds observed are mostly resident breeding organisms (24 or 89%) including 7 endemic species. Two (7%) are introduced species (*P. montanus* and *A. cristatellus*) while 1 (4%) is unclassified since its identification is limited to the genus level. It should be noted that 9 species under 7 families were recorded only from Ateneo de Manila.

Mammals

Ten species of terrestrial mammals were identified. Of these, 5 are small non-volant (*Suncus murinus*, *Rattus tanezumi*, *R. exulans*, *R. argentiventer,* and *R. norvegicus*) while the remaining 5 are volant (*Cynopterus brachyotis*, *Ptenochirus jagori*, *Rousettus amplexicaudatus*, *Eonycteris spelaea,* and *Myotis muricola*). All recorded small non-volant mammals are introduced species. Of the 5 volant mammals, 4 species (*C. brachotis*, *P. jagori*, *R. amplexicaudatus,* and *E. spelaea*) belong to family Pteropodidae. The remaining species (*M. cyclotis*) belong to family Vespertilionidae.

UP Diliman Campus

Trapping of Small Non-volant Mammals

Only 12 individuals under 2 families were trapped and identified during the whole duration of the study (Table

Table. 3 List of observed bird species from the UP Diliman Campus

Scientific Name	Common Name	Endemicity/Residency Status
Family Ploceidae		
1. *Passer montanus*	Eurasian Tree Sparow	Introduced
Family Pycnonotidae		
2. *Pycnonotus goiavier*	Yellow-vented Bulbul	Resident breeder
Family Dicaeidae		
3. *Dicaeum sp.*	Flowerpecker	
Family Columbidae		
4. *Streptopelia chinensis**	Spotted Dove	Resident breeder
5. *Geopelia striata*	Zebra Dove	Resident breeder
6. *Phapitreton leucotis*	White-cared Brown-dove	Endemic
Family Laniidae		
7. *Lanius cristatus**	Brown Shrike	Winter Visitor
8. *Lanius validirostris*	Mountain Shrike	Endemic
9. *Lanius schack*	Long-tailed Shrike	Resident breeder
Family Sylviidae		
10. *Megalurus timoriensis*	Tawny Grassbird	Resident breeder
11. *Megalurus palustris*	Straited Canegrass Warbler	Resident breeder
12. *Phylloscopus cebuensis*	Lemon-throated Leaf-warbler	Endemic
13. *Phylloscopus sp.*	Warbler	
14. *Orthotomus sp.*	Tailorbird	
Family Motacillidae		
15. *Motacilla cinerea**	Grey Wagtail	Winter visitor
16. *Anthus novaeseelandiae**	Richard's Pipit	Resident breeder
Family Nectariniidae		
17. *Nectarinia sp.*	Sunbird	
Family Cuculidae		
18. *Cacomantis variolosus*	Brush Cuckoo	Resident breeder
Family Muscicapidae		
19. *Rhipidura javanica*	Pied Fantail	Resident breeder
20. *Ficedula narcissina**	Narcissus Flycatcher	Winter visitor
Family Hirundinidae		
21. *Hirundo tahitica*	Pacific Swallow	Resident breeder
Family Alcedinidae		
22. *Halcyon coromanda**	Ruddy Kingfisher	Resident breeder, Winter visitor
23. *Halcyon chloris*	White-collared Kingfisher	Resident breeder
Family Accipitridae		
24. *Spilornis cheela**	Crested Serpent Eagle	Resident breeder
25. *Accipiter trivirgatus**	Crested Goshawk	Resident breeder
Family Ardeidae		
26. *Bubulcus ibis**	Cattle Egret	Resident breeder
27. *Ixobrychus cinnamoneus**	Cinnamon Bittern	Resident breeder
Family Picidae		
28. *Dendrocopos maculatus*	Phil. Pygmy Woodpecker	Endemic

Family Apodidae		
29. *Collocalia esculenta**	Glossy Swiftlet	Resident breeder
30. *Hirundapus celebencis*	Purple Needle Tail	Endemic
Family Estrildidae		
31. *Lonchura malacca**	Chestnut Munia	Resident breeder
32. *Lonchura leucogastra*	White-bellied Munia	Resident breeder
33. *Lonchura sp.*	Munia	
Family Rallidae		
34. *Amaurornis phoenicurus**	White-breasted Waterhen	Resident breeder
35. *Gallirallus torquatus*	Barred Rail	Resident breeder
36. *Gallirallus sp.*	Rail	
Family Sturnidae		
37. *Acridotheres cristatellus*	Crested Myna	Introduced
Family Turdidae		
38. *Copsychus saularis**	Oriental Magpie Robin	Resident breeder

* recorded only from the UP Diliman Campus

5). Of these, 10 individuals are *S. murinus* while the remaining 2 are single individuals of *R. norvegicus* and *R. exulans*.

Mist Netting of Volant Mammals

Netting was condcuted in 7 sites. A total of 314 individuals were captured. Five species were identified under 2 families (Table 5).

Two hundred eighty-nine (92%) individuals of *C. brachyotis* were captured. *P. jagori* ranked second with a total of 16 (5%) individuals; *R. amplexicaudatus* is third with 7 individuals. *E. spelaea* and *M. muricola* are both with 1 individual. The single individual of *M. muricola* was captured by hand in its roosting area in Sampaguita Dormitory near the Arts and Sciences Building. Of these 5 species, only *P. jagori* is endemic while the rest are native species.

Ateneo de Manila University Campus

Trapping of Small Non-volant Mammals

From July to mid-August 1998, trapping was conducted in Ateneo de Manila. Sampling sites utilized were similar to those in the herpetofaunal survey. A total of 265 trap nights (i.e., 112 for site 1, 82 for site 2, and 71 for site 3) were obtained. Only live traps were used. Twenty-five individuals under 2 families were identified (Table 6). The highest number of captured individuals belong to the family (*S. murinus)* Soricidae (8). *R. tanezumi* and *R. argentiventer* followed closely, each with 7 individuals. There were 2 individuals classified as *R. norvegicus* and one identified as *R. exulans*.

Mist Netting of Volant Mammals

Netting of bats in Ateneo de Manila was limited to only 1 site. A total of 52 individuals representing 2 species and 1 family were captured and identified (Table 6). The majority of the netted bats were *C. brachyotis* (49 individuals), the rest are *R. amplexicaudatus*. Netting was limited to only 1 site because of the lack of poles or strategic natural standing trees which can serve as replacement for poles in the other 2 sites.

DISCUSSION

Herpetofauna

The number of recorded amphibians and reptiles (19 species) represents nearly 6% of the total known species (253 reptiles and 83 amphibians) in the Philippines. This limited number of species (species

Table. 4 List of observed bird species from the Ateneo de Manila Campus

Scientific Name	Common Name	Endemicity/Residency Status
Family Ploceidae		
1. *Passer montanus*	Eurasian Tree Sparow	Introduced
Family Pycnonotidae		
2. *Pycnonotus goiavier*	Yellow-vented Bulbul	Resident breeder
Family Dicaeidae		
3. *Dicaeum australe**	Red-keeled Flowerpeeker	Endemic
Family Columbidae		
4. *Geopelia striata*	Zebra Dove	Resident breeder
5. *Phapitreron leucotis*	White-eared Brown-dove	Endemic
6. *Chalkcophaps indica**	Common Emerald-dove	Resident breeder
7. *Streptopelia bitorquata**	Island Collared-dove	Resident breeder
Family Laniidae		
8. *Lanius schach*	Long-tailed Shrike	Resident breeder
9. *Lanius validirostris*	Mountain Shrike	Endemic
Family Syliviidae		
10. *Megalurus palustris forbesi*	Striated Grassbird	Endemic race
11. *M. timoriensis tweeddalei*	Tawny Grassbird	Endemic race
12. *Phylloscopus cebuensis*	Lemon-throated Leaf-warbler	Endemic
13. *Orthotomus sp.*	Tailorbird	
Family Nectariniidae		
14. *Nectarinia jugularis**	Olive-backed Sunbird	Resident breeder
Family Cuculidae		
15. *Cacomantis variolosus*	Brush Cuckoo	Resident breeder
16. *Centropus viridis**	Philippine Coucal	Endemic
17. *Centropus bengalensis**	Lesser Coucal	Resident breeder
Family Muscicapidae		
18. *Rhipidura javanica*	Pied Fantail	Resident breeder
Family Hirundinidae		
19. *Hirundo tahitica*	Pacific Swallow	Resident breeder
Family Alcedinidae		
20. *Halcyon chloris*	White-collared Kingfisher	Resident breeder
Family Picidae		
21. *Dendrocopos maculatus*	Philippine Pygmy Woodpecker	Endemic
Family Estrildidae		
22. *Lonchura leucogastra*	White-bellied Munia	Resident breeder
Family Rallidae		
23. *Gallirallus torquatus*	Barred Rail	Resident breeder
24. *Gallirallus striatus**	Slaty-breasted Rail	Resident breeder
Family Sturnidae		
25. *Acridotheres cristatellus*	Crested Myna	Introduced
Family Pittidae		
26. *Pitta erythrogaster**	Red-bellied Pitta	Resident breeder
Family Psittacidae		
27. *Loriculus philippensis**	Philippine Hanging-parrot	Endemic

* recorded only from the UP Diliman Campus

richness) encountered was expected since it was observed that species richness decreased from forest to non-forest habitats (Brown & Alcala, 1964, in Diesmos, 1998).

Of the 6 identified amphibians, only 1 species (*R. magna*) is endemic. The rest are either introduced or native species. *R. magna* is known for its wide distribution and ability to adapt to altered habitats (Alcala & Custodio, 1995). This explains its continuous survival in the 2 study areas. *B. marinus* was introduced in 1934 in Negros Island primarily as a biological control for sugar cane beetles but due to lack of ecological studies prior to its introduction, it became a biological pollutant. It was able to adapt to a wide range of local habitats, and was later suspected of displacing other native and endemic species. Worse, it is now distributed in every major island in the Philippines. *H. rugulosus* is another introduced species. Its introduction was primarily as an extra and cheap source of meat. At present, it has established a successful population in many parts of Luzon Island and could be another *B. marinus* in the making. *R. erythraea* was originally distributed only in Boracay, Calga-an, Guimaras, Masbate, Mindanao, Negros, Panaon, Panay, Sibuyan, and Tablas. But current field studies revealed that its presence was detected in Luzon in the early 1990's. Such alteration in its distribution can be attributed to inter-island introduction by humans (Diesmos, 1998). Except for *R. magna*, all amphibian species identified in this study are considered commensals of people (Alcala & Custodio, 1995).

Only 2 species of reptiles (*R. spilogaster* and *N. philippinensis*) are endemic. These 2 species are known to adapt to disturbed habitats, though observed individuals might represent a struggling population in the area. The presence of grassland patches and a relatively high population of small non-volant mammals could have sustained their presence. *C. amboinensis* could have been introduced for aesthetic purposes, or it could have been former pet that was released by its owner. The turtle could have survived because of the availability of possible food items such as small fishes, tadpoles, and a variety of insects inhabiting the pond and also due to its ability to thrive in stagnant and unclean water.

V. salvator could be part of a larger and probably stable population. Based on interviews, this species is abundant in Ateneo de Manila, specifically in site 1. Unlike its congener *V. olivaceus* which has a limited diet consisting only of fruits, *V. salvator* has a wide variety of food items (i.e., remains of dead animal, food left-overs, and other small vertebrates that it can capture) allowing it to inhabit disturbed areas. *G. gecko, L. aulicus,* and *M. multifasciata* are also known to thrive in highly disturbed areas which can also be attributed to their wide range of diet. House geckoes (*G. mutilata, H. frenatus, H. stejnegeri,* and *C. platyurus*), are known commensals of people, which was also observed.

Avifauna

Species Richness and Habitat Distribution

A total of 354 individuals belonging to 47 species were recorded. These observed species represent more than 8% of the total known species (556) in the Philippines. Of the 47, *P. montanus* was the most commonly encountered species (126 individuals). It was introduced in the 1930's together with other species of sparrows. It adapted to the Philippine conditions, most especially in highly disturbed areas such as cities, agricultural areas, and plantations, which allowed it to persist and eventually dominate these areas. In fact, it has become a pest in many rice plantations.

P. goiavier, with 39 individuals, ranked second. This species is of the colonizing type. Like *P. montanus, P. goiavier* has adapted itself to highly disturbed habitats enabling it to exhibit more stable populations in such conditions.

L. cristatus was third in rank (29 individuals), but it was not recorded in Ateneo de Manila. *L. cristatus* is a winter visitor from China and Siberia. Its presence, together with other species of winter visitors, is observed only in the Philippines from late September to March. Fieldwork in the Ateneo was conducted from July to mid-August 1998, which was outside the migration period of this species. Thus, the high number of recorded

Table. 5 List of recorded volant and non-volant mammals from the UP Diliman Campus

Scientific Name	Sampling Site 1	Sampling Site 2	Sampling Site 3	Sampling Site 4	Sampling Site 5	Sampling Site 6	Sampling Site 7	Total	Percent
Volant									
Family Pteropodidae									
1. *Cynopierus brachyotis*	31	17	75	90	36	20	20	289	92.04%
2. *Ptenochirus jagori*	3	1	5	3	2	2	-	16	5.10%
3. *Rousettus amplexicaudatus*	1	-	-	2	3	1	-	7	2.22%
4. *Eonycteris spelaea*	-	-	-	1	-	-	-	1	0.32%
Family Vespertilionidae									
5. *Myotis muricola*	-	-	-	-	-	-	1*	1	0.32%
Total	35	18	80	96	41	23	21	314	100%
Non-volant									
Family Soricidae									
6. *Suncus murinus*	-	1	1	8	-	-	-	10	83%
Family Muridae									
7. *Rattus norvegicus*	-	-	-	1	-	-	-	1	8.3%
8. *Rattus exulans*	-	-	-	1	-	-	-	1	8.3%
Total	-	1	1	10	-	-	-	12	100%

Legend:
Sampling Site 1 - Public Administration
Sampling Site 2 - University of the Philippines Integrated School
Sampling Site 3 - Executive House Premises
Sampling Site 4 - Arboretum area
Sampling Site 5 - Lagoon-Beta Way area
Sampling Site 6 - Ikapati Farm
Sampling Site 7 - Arts and Sciences Building ("Jurassik Park")
* - Caught by hands

individuals in UP Diliman can be attributed to the season during which fieldwork was undertaken.

H. tahitica and *L. schach* ranked fourth and fifth, respectively (*H. tahitica*-22 individuals; *L. schach*-21). A much higher individual record of *H. tahitica* was observed in UP Diliman (21 individuals) compared to the Ateneo (1 individual). In the case of *L.schach,* only 6 individuals were observed in UP Diliman while 15 were seen in Ateneo. Both species are primarily insectivores, although *L. schach* is also semi-raptorial. It should also be noted that the two exhibit different vertical distributions, but their highly similar diet might have affected their distribution and dominance in a given area, most especially if available resources are limited. Thus, as a result of competition between these two species or other species sharing the same food item, resource partitioning develops (Smith, 1985 as cited by Alcantara et al., 1993).

A similar case was observed between *G. striata* and *S. chinensis* in UP Diliman and between *G. striata* and *S. bitorquata* in Ateneo de Manila. In the first case, *S. chinensis* outnumbered *G. striata* while in the second, *G. striata* outnumbered *S. bitorquata.* These 3 species exhibit similar diet and habitat. As a result of competition, only a certain species tends to dominate a given area.

Four individuals of *L. philippinensis* were recorded in the vicinity of the Biology Greenhouse in Ateneo. These are most probably pets that escaped captivity and have become feral. These birds are normally associated with forested areas. Alternatively, these could be part of a struggling population that found the remaining vegetation around the Jesuit Residence a suitable habitat.

Comparison with Historical Records

Of the 17 species listed by Wardlaw (1884), not one was recorded in this study. However, there is difficulty

Table. 6 List of recorded volant and non-volant mammals from the Ateneo de Manila Campus

Scientific Name	Sampling Site 1	Sampling Site 2	Sampling Site 3	Total	Percent
Volant					
Family Pteropodidae					
1. *Cynopierus brachyotis*	49	-	-	49	94%
2. *Rousettus amplexicaudatus*	3	-	-	3	5.8%
Total	52	-	-	52	100%
Non-volant					
Family Soricidae					
3. *Suncus murinus*	3	4	1	8	32%
Family Muridae					
4. *Rattus tanezumi*	2	3	2	7	28%
5. *Rattus argentiventer*	2	-	5	7	28%
6. *Rattus norvegicus*	1	-	1	2	8%
7. *Rattus exulans*	1	-	-		4%
Total	9	8	8	25	100%

Legend: Sampling Site 1 - Jesuit Residence, J. P. Renewal Center, Cervini and Eliazo Hall, and portion of Loyola House of Studies
Sampling Site 2 - College Football and Baseball Field
Sampling Site 3 - Urban Food Center (Ateneo Sweet Corn)

in ascertaining whether the species listed by Wardlaw were found anywhere near UP Diliman and its immediate environs, since the author broadly referred to the study area as within the vicinity of Manila. Further reference was made to his list as those of birds from Luzon. In Dickinson et al.'s (1991) review of Philippine birds, very little mention was made of this publication, an indication that the problem with the lack of accurate site locality of the species listed was a major hindrance to the acceptability of Wardlaw's report.

Of the 3 species Rabor (1936 a and b) listed from Novaliches, only 2 species (*P. goiavier* and *L. schach*) were recorded in this study. The third species, *Cisticola exilis* is presumed to be locally extinct.

Data from the 9 species of birds housed at the Museum of Birds and Mammals, UP Diliman revealed that they were collected as far back as 1963 and as late as 1971. All 9 species are still found in other parts of the country. However, only *P. goiavier*, *L. schach*, and *C. variolosus* have been recorded in this study. The rest are presumed to be locally extinct, as these species are more dependent on forest-like habitats, a habitat type now absent in the two study areas.

These species include 2 species of owls, *Tyto capensis* (grass owl) and *Bubo philippensis* (Philippine eagle-owl), a species of thrush, *Monticola solitarius*, (blue rock-thrush), a species of tern, *Chlidonias leucopterus* (white-winged tern), a species of cisticola, *Cisticola exilis* (bright-capped Cisticola), and a species of malkoha, *Phaenicophaeus superciliosus* (red-crested Malkoha). Interestingly, the first 4 species were collected directly from the UP Diliman campus, while the fifth one was collected from Novaliches. The last species was collected from Antipolo, Rizal.

Of the 4 species collected from UP Diliman, the 2 species of owls are now presumably locally extinct (i.e., they are still found elsewhere in the country but not in Diliman). Two other species collected from UP Diliman are visitors; one is a passage visitor (*C. leucopterus*) while the other is a winter visitor (*M. solitarius*). These were not recorded either because observations were made outside of their migrating season or they have also become locally extinct. The fifth species, *C. exilis*, was not recorded in the current study and is also presumed to be locally extinct. The reason for the absence of the sixth species, *P. superciliosus*, could not be ascertained, since it could possibly still be found

in Antipolo, Rizal. However, if it originally formed part of the Diliman avifauna, it would be safe to assume that it has become locally extinct too.

Mammals

A total of 10 species (5 volant and 5 non-volant) of land mammals were observed. These represent 6% of the total record (74 bats and 106 non-volant) in the Philippines. Forested areas are the principal habitat of most endemic terrestrial mammals (Heaney et al., 1998). In effect, the non-forest and highly disturbed habitats offered by the two study areas can accommodate a limited species of terrestrial mammals. This is very true in the case of non-volant mammals since they are less vagile. They can not easily transfer from one area to another during times of relative food scarcity. Therefore, expected species will be highly adapted to non-forest areas.

Species of non-volant mammals caught were all introduced. *R. exulans* was limited to the Jesuit Residence of Ateneo de Manila and the arboretum of UP Diliman since these are the only sites that exhibit good vegetation cover provided by some remaining and planted tree species. Unlike, the other introduced species of small non-volant mammals, *R. exulans* is associated more with disturbed and regenerating forest. *S. murinus* was the species most often captured (18) and was recorded in all the sites. This suggests that the population level of *S. murinus* is high and that they are highly adapted to the conditions of the study areas. *R. tanezumi* and *R. argentiventer* were second in terms of number of individuals caught (7 each). The former is associated with urban areas, agricultural lands, and disturbed forests while the latter is abundant in rice fields, grasslands, and plantations. These habitat types are all found in the study areas. The distribution of *R. norvegicus* is restricted to large cities. It is the rat species usually observed in garbage areas. The presence of garbage dumping areas in the study areas encourages the presence of this species.

Of the 5 species of non-volant mammals that were recorded, only 1 is endemic (*P. jagori*) while the rest are native but non-endemic. *P. jagori* is usually observed in primary and secondary forests and occasionally, in agricultural areas near forests. Since fruit bats are known to travel great distances when foraging, it is highly probable that the individuals of *P. jagori* caught were just "passers-by." They could have originated from the nearby secondary forests of Rizal. *M. muricola* are supposed to be limited to primary and secondary lowland and montane forest. However, an individual was caught by hand from its roosting area in Sampaguita Dormitory near the Arts and Sciences Building. Their presence in UP Diliman is highly possible since their primary diet are insects which are prevalent in the study areas as evidenced by the presence of many insectivorous birds. *R. amplexicaudatus*, *E. spelaea*, and *C. brachyotis* are frugivore and/or nectarivore species associated more with agricultural areas. The presence of possible fruit bearing trees and limited agricultural areas such as those in Ateneo, as well as the adaptability of these 3 species to non-forest habitats, explain their presence in the area.

CONCLUSIONS

With 76 species of amphibians, reptiles, birds, and mammals that thrive in the area, the remaining sparse vegetation in UP Diliman and Ateneo de Manila seems to provide a suitable habitat.

The species found are not as exceptional as those found in undisturbed ecosystems. However, considering the transformation and degradation that has taken place in the study areas, finding this diverse assemblage of wildlife is already something that the Diliman community as a whole can be proud of.

More than 61% of species found in the study areas were birds. A review of the historical records of the assemblage of bird species in the UP Diliman area and its environs (Rabor, 1936 a and b; records at the Museum of Birds and Mammals in UP Diliman) indicates that six species of birds that were used to be found in the study sites, are now no longer recorded.

In general, the Diliman area, like any other highly developed urban area, has undergone a transformation that has wiped out its original ecosystems and habitats. Because of these changes, at least three species of

birds (*T. capensis*, *B. philippensis*, and *C. exilis*) have become locally extirpated in the last 35 years in the Diliman area alone, while another species (*L. validirostris*) on the list is in the near threatened category of the IUCN.

Steps must be taken to ensure that the wildlife resource does not disappear, and that it continues to thrive side by side with developments in the area.

This study was able to show that the degration of an area does not mean that biodiversity is automatically dimished. Only after a thorough inventory of the area's biodiversity can one make such a conclusion.

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