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Wildlife Diversity on the Kasetsart University Si Racha Campus, Chon Buri Province

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ABSTRACT

A study of wildlife diversity on the Si Racha campus, Kasetsart University was conducted in a natural, secondary mixed-deciduous forest from April 2003 to December 2005. The work involved original field observations, a review of available literature on wildlife species and the establishment of a species checklist, with information on conservation status. Permanent roadside counts, live traps, pitfall traps and camera traps were used for the field survey. The results indicated the presence of 173 species consisting of 10 amphibians, 13 reptiles, 128 birds and 22 mammals. According to the Wildlife Preservation and Protection Act 2003, 143 (85%) of these species were protected and 33 (19%) were included on the Wildlife Thai Red List (2007). The recent survey did not detect 77 (44%) of the formerly recorded species in this area. The findings indicate that wildlife resources around the campus are under threat by urbanization and environmental pollution. It is recommended that the campus manager should consider conducting long-term monitoring of wildlife diversity, should develop a habitat management plan for maintaining wildlife diversity and should a prepare mitigation plan for reducing conflict between the crab-eating macaque (*Macaca fascicularis*) and humans.

Keywords: biodiversity, urbanization, fragmented habitat, eastern Thailand, industrial colony

INTRODUCTION

Millions of hectares of tropical forest in Southeast Asia have been destroyed and degraded in recent times (Koh and Sodhi, 2010). Land use management practices often change habitat structure, which in turn influences diversity and the composition of wild plants and animals (Seymour and Dean, 2010). Expansive urban intensification poses the largest threat to biodiversity besides fragmented habitat, caused for example by road barrier effects, pollution and invasive species (Sodhi and Brook, 2006; Strohbach *et al.*, 2009; Pongpattananurak and Duengkae, 2010). From 1961 to 2006, Thailand's forest cover declined from 53 to 32% of the total land area of the country, but only 25% has been classified as protected areas (ONEP, 2006; Trisurat, 2007). From these results, nearly 70% is covered by agriculture and urban areas. Most of the urban areas consist of buildings, infrastructure and industrial factories. Many wild animal and plant species are environmentally sensitive and disappear when disturbed (Gillham and Smith, 1983) and this has accounted for the local extinction of wildlife in Thailand, especially Schomburgk's deer (*Rucervus schomburgki*), hog deer (*Axis porcinus*) and the white-eyed river-martin (*Pseudochelidon sirintarae*)(ONEP,

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2007). Numerous studies have reported that the green areas—parks, temples and university campuses—in urban ecosystems are harbors of remnant wildlife in Thailand (for example, Khobkhet, 2002; Sukmasuang *et al*., 2007; Round, 2008; Sukmasuang *et al.*, 2009).

Kasetsart University has four main campuses; only on the Kasetsart University campus, Chalermphrakiat Sakon Nakhon, Sakon Nakhon province has research been conducted on bird species (Duengkae, 2010). The Kasetsart University Si Racha campus (KUSRC), Chon Buri province was established in 1999. KUSRC is surrounded by oil refineries and the Lam Chabang industrial colony (Khopai, 2006). With increasing threats to the biodiversity on KUSRC, a database is necessary for sound environmental decision-making. The only plant community data relating to KUSRC were reported by Khopai (2006), but a wildlife census of this area has not been undertaken. Thus, the aim of the present study was to present a current record of wildlife species diversity and to provide a database for biodiversity monitoring on this campus.

MATERIALS AND METHODS

Study site

KUSRC (UTM 145900 N,708400 E) is located in Thungsukla subdistrict, Sri Racha district, Chon Buri province, eastern Thailand. Site details are provided in Khopai (2006). KUSRC is located in the Khao Kaset forest area (KKFA) in the Khao Num sub-foothills near an oil refinery and the Lam Chabang industrial colony (Figure 1). The region has a tropical climate that is influenced by the annual monsoon (Figure 2). The average annual rainfall is 1182.70 mm, with a six-month dry season (monthly rainfall less than 100 mm) starting in November and ending in April. The rainy season (monthly rainfall more than 100 mm) ranges over May to October. Recorded mean monthly rainfall

Figure 1 Kasetsart University Si Racha campus (KUSRC) photographed from the hilltop of the Khao Kaset forested area (KKFA) showing the nearby oil refinery industry and Lam Chabang industrial colony.

ranges from a minimum in December of 10.6 mm to a maximum in September of 275.8 mm. Mean temperatures range from 26.6 to 27.6 °C in the cool season extending from December through February and from 28.4 to 29.3 °C in the hot season from March through May. Khopai (2006) reported the principal vegetation of the KKFA as secondary growth of mixed deciduous forest, with 129 plant species belonging to 116 families and 46 genera. The dominant species are *Atalantia monophylla, Bauhinia bracteata, Lannea coromandelica, Termina liatriptera, Diospyros bejaudii* and *Antidesma ghaesembilla*.

Methods

The study area was located in both the main campus and the KKFA adjacent area behind the KUSRC. A multi-taxa census was undertaken from April 2003 to December 2005. The current study was a census restricted to determining the species diversity of amphibians, reptiles, birds and mammals. Various techniques were used to survey each faunal group.

For diurnal wildlife, two permanent routes were established—one (about 1 km) in the main campus of KUSRC and the other (about 1 km) in the KKFA mixed deciduous forest. Monthly observations were conducted from 0700 to 1000 and from 1600 to 1800 hours. Walking at a slow speed, resulted in about 1.5–2 hr of observation time for every kilometer of trail surveyed. All wildlife seen or heard (only birds observed within 30 m) along the trail was recorded (Bibby *et al.*, 1992; Round and Brockelman, 1998). Direct observations were made using binoculars (8 × 35). The recorded data included species identification using Lekagul and McNeely (1977) for mammals, Lekagul and Round (1991) for birds, Cox *et al*. (1998) for reptiles and Chan-ard (2003) for amphibians. The number of individuals, the time of observation, the observed behavior and activity, and a visual estimate of the individual's height above the ground were also recorded.

Small terrestrial vertebrates were recorded from live traps and pit-fall traps. Ten live traps (15 × 15 × 30 cm) and pitfall traps (23 × 23 × 34 cm) (Heyer *et al.*, 1994; Wilson *et al*., 1996; Nakashizuka and Stork, 2002) were repeatedly randomly placed during every observation period, but only in KKFA. Live traps containing banana or jackfruit bait were placed with at least 100 m between traps. Traps were checked twice

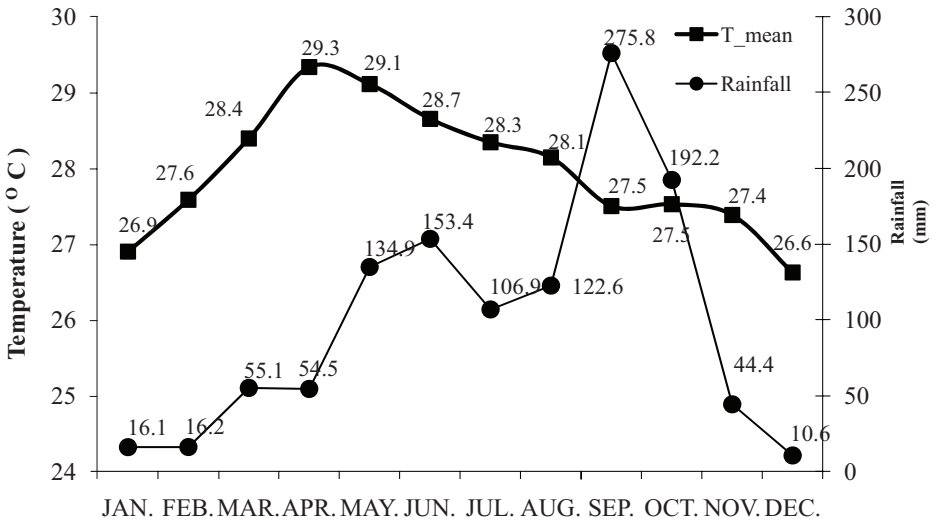

Figure 2 Climatic diagram from the Lam Chabang Meteorological Station; T_mean = Monthly temperature; and Rainfall= Monthly rainfall (averaged from 1995 to 2006).

daily (0600–0800 and 1600–1800 hours). The trapped animals were recorded for species, age, sex, reproductive status and weight (grams).The animals were released at the trapping site.

Two automatic camera traps were used to record small-to-medium-sized terrestrial mammals within KKFA (Figure 3A). The camera traps were placed along nature trails, water resources and trees bearing fruit. The automatic camera traps had a far-infrared sensor, motor-drive camera and flash. The warm body temperature of animals triggered the camera traps; each photograph was stamped with the time and date of capture (Miura *et al*., 1997; Marod *et al*., 2010). The camera traps were installed at about 50 cm above the ground and the camera was angled downwards to optimize photographing any animals that had activated the sensor (Figures 3B and 3C). Each census period consisted of 24 hours during one week per month. The images from camera trap photos were identified according to Lekagul and McNeely (1977).

Data analysis

Only data on wildlife species diversity were used in this study. In addition, the former work by Thammich *et al*. (1992) was also considered, and the existing wildlife species list of wildlife was revised. The author of the present paper was one of the field staff for the earlier study. A checklist also included the status of wildlife according to the Wildlife Reservation and Conservation Act B.E. 2535 (A.D.1992) (Wildlife Conservation Office, 2010), and the conservation status according to ONEP (2007).

RESULTS AND DISCUSSION

In total, 173 species consisting of 10 amphibians (7%), 13 reptiles (7%), 128 birds (73%) and 22 mammals (13%) were found on KUSRC (Table 1; Figures 3B and 3C). Most of the species (85%) were classified as legally protected species represented by 38% of the reptiles, 59% of the mammals and 98% of the bird species, but no amphibian species were classified as protected. Only 33 species (19%) were classified according to ONEP (2007): 1 species was Critically Endangered (CR); 2 species were Endangered (EN); 2 species were Vulnerable (VU); 9 species were Near-

A

B

C

Figure 3 A) Automatic camera trap set up in study; B) Asian palm civet and C) Crab-eating macaque pictures taken by camera trap.

threatened (NT); 18 species were Least-Concerned (LC); and 1 species was Data Deficient (DD).

The results for bird species were quite similar to those reported by Nakhasathien (1981, 1983) and Wildlife Conservation Division (1999) from the Bang Pra Reservoir, which is adjacent to KUSRC (declared as the Bang Pra Reservoir Non-Hunting Area in 1976).

From the study results nearly a decade earlier, 77 species (44%) of wildlife that had been reported in 1992 were not recorded in the present survey of the area (Table 1), especially the medium-sized carnivore mammals such as the jungle cat (*Felis chaus*), leopard cat (*Prionailurus bengalensis*), fishing cat (*Prionailurus viverrina*), and small Indian civet (*Viverricula indica*). This group, classified as indicator species, is not able to survive in human-disturbed ecosystems (Vierikko *et al.,* 2010). Although many of the species had been reported before 1976 (Wildlife Conservation Division, 1999), such as the jungle cat and fishing cat, they might have been extirpated from this area for a long time. However, it is important to place them on a current checklist, because future data may be used to support wildlife recovery programs in this area.

The current status for KUSRC was identified as a disturbed and isolated habitat, particularly because of poor dispersal ability for wildlife, especially amphibians, reptiles and terrestrial mammals. Thus, progressive urbanization has resulted in the replacement of many species by a smaller number of widespread species, for example, the black-spined toad (*Duttaphrynus melanostictus*), common treefrog (*Polypedates leucomystax*), changeable lizard (*Calotes versicolor*), common sun skink (*Eutropis multifasciata*), rock pigeon (*Columba livia*), common myna (*Acridotheres tristis*), Finlayson's squirrel (*Callosciurus finlaysonii*) and the crab-eating macaque (*Macaca fascicularis*). Urbanization and industrialization in the study area have also fostered the local extinction of species unable to adapt to the changing conditions (Mortberg, 2001; Crooks *et al*., 2004; Castelletta *et al*., 2005), for example, the spotted ground gecko (*Dixonius siamensis*), red jungle fowl (*Gallus gallus*), barred buttonquail (*Turnix suscitator*) and the Asian gray shrew (*Crocidura attenuata*). However, the population trend of the crab-eating macaque (*Macaca fascicularis*) has shown an increase (Duengkae, *per. obs*.). Malaivijitnond and Hamada (2008) reporting on the then-current situation of the crab-eating macaque concluded that the habitat for this species had changed from natural forests to urban or recreation parks and that the species had adapted well to disturbed habitats. Moreover, many sites were overpopulated and there were conflicts with humans in Thailand.

Recommendations

Although the results suggest overall that KUSRC is capable of supporting greater wildlife diversity, the threat of urbanization and environmental pollution are making it quite difficult to maintain local biodiversity. KUSRC is surrounded by development associated with the continually expanding oil refinery industry and the Lam Chabang industrial colony (see Figure 1). Campus managers should consider the following recommendations:

1. Future studies should be conducted by researchers from KUSRC on the long-term monitoring of wildlife diversity, in particular the crab-eating macaque (*Macaca fascicularis*) population in response to the changing habitat.

2. Implementing controls on wildlife management activities, such as prohibiting the cutting of large trees, curtailing wildlife poaching and promoting the planting of fruit trees for wildlife.

3. Particular emphasis should be placed on population management of the crab-eating macaque and mitigating conflict with humans. If the carrying capacity of the area is reached for this species, control strategies should be adopted such as translocation of individuals or contraception.

Table 1 List of wildlife recorded on the Kasetsart University Si Racha campus, Chon Buri province.

Common name	Species name	Status	
		Act.[1]	ONEP[2]
Class Amphibia			
Order Anura			
Family Bufonidae			
1. Black-spined toad	*Duttaphrynus melanostictus*		LC
2. Red Small Toad†	*Ingerophrynus parvus*		LC
Family Dicroglossidae			
3. Rice field frog	*Fejervarya limnocharis*		DD
4. Chinese Tiger Frog†	*Hoplobatrachus rugulosus*		LC
Family Microhylidae			
5. Median-striped Bullfrog	*Kaloula mediolineata*		NT
6. Painted bullfrog	*Kaloula pulchra*		LC
7. Ornate chorus frog	*Microhyla fissipes*		LC
8. Noisy frog	*Microhyla butleri*		LC
9. Drak-sided chorus frog	*Microhyla heymonsi*		LC
Family Rhacophoridae			
10. Common treefrog	*Polypedates leucomystax*		LC
Class Reptilia			
Order Chelonia			
Family Testudinidae			
11. Elongated Tortoise†	*Indotestudo elongata*	P	EN
Family Trionychidae			
12. Common Softshell†	*Amyda cartilaginea*	P	VU
Order Squamata			
Family Gekkonidae			
13. Spotted Ground Gecko	*Dixonius siamensis*		LC
14. Tokay Gecko†	*Gecko gecko*		LC
Family Agamidae			
15. Changeable Lizard	*Calotes versicolor*		LC
Family Scincidae			
16. Common Sun Skink	*Eutropis multifasciata*		LC
Family Varanidae			
17. Indian Monitor†	*Varanus bengalensis*	P	NT
18. Common Water Monitor†	*Varanus salvator*	P	LC
Family Pythonidae			
19. Reticulated Python†	*Broghammerus reticulatus*	P	LC
Family Colubridae			
20. Mock Viper	*Psammodynastes pulverulentus*		LC
Family Elapidae			
21. Common Cobra†	*Naja kaouthia*		LC

Table 1 (Cont.)

Common name	Species name	Status	
		Act.[1]	ONEP[2]
Family Viperidae			
22. Malayan Pit Viper†	*Calloselasma rhodostoma*		LC
23. Pope's Pit Viper†	*Cryptelytrops albolabris*		LC
Class Aves			
Order Galliformes			
Family Phasianidae			
24. Red Junglefowl	*Gallus gallus*	P	
Order Turniciformes			
Family Turnicidae			
25. Barred Buttonquail	*Turnix suscitator*	P	
Order Piciformes			
Family Picidae			
26. Grey-capped Pygmy Woodpecker†	*Dendrocopos canicapillus*	P	
27. Laced Woodpecker†	*Picus vittatus*	P	
28. Black-headed Woodpecker†	*Picu serythropygius*	P	
29. Common Flameback†	*Dinopium javanense*	P	
Family Megalaimidae			
30. Lineated Barbet	*Megalai malineata*	P	
31. Coppersmith Barbet	*Megalai mahaemacephala*	P	
Order Upupiformes			
Family Upupidae			
32. Common Hoopoe	*Upupa epops*	P	
Order Coraciiformes			
Family Coraciidae			
33. Indian Roller	*Coracias benghalensis*	P	
Family Halcyonidae			
34. Common Kingfisher†	*Alcedo atthis*	P	
35. Stork-Billed Kingfisher†	*Pelargopsis capensis*	P	
36. White-throated Kingfisher	*Halcyon smyrnensis*	P	
37. Black-capped Kingfisher	*Halcyon pileata*	P	
38. White Collared Kingfisher†	*Halcyon chloris*	P	
Family Meropidae			
39. Green Bee-Eater†	*Merops orientalis*	P	
40. Blue-tailed Bee-eater†	*Merops philippinus*	P	
41. Chestnut-headed Bee-eater	*Merops leschenaultia*	P	
Order Cuculiformes			
Family Cuculidae			
42. Green-billed Malkoha	*Phaenico phaeustristis*	P	
43. Asian Koel	*Eudynamys scolopacea*	P	

Table 1 (Cont.)

Common name	Species name	Status	
		Act.[1]	ONEP[2]
Family Centropodidae			
44. Greater Coucal	*Centopus sinensis*	P	
45. Lesser Coucal	*Centropus bengalensis*	P	
Family Psttacidae			
46. Vernal Hanging Parrot†	*Loriculus vernalis*	P	
47. Alexandrine Parakeet†	*Psitta culaeupatria*	P	EN
48. Red-Breasted Parakeet†	*Psittacula alexandri*	P	
Order Apodiformes			
Family Apodidae			
49. Asian Palm Swift	*Cypsiurus balasinensis*	P	
50. House Swift	*Apus affinis*	P	
Order Strigiformes			
Family Caprimulgidae			
51. Barn Owl†	*Tyto alba*	P	NT
Family Strigidae			
52. Brown Hawk Owl†	*Ninox scutulata*	P	
53. Collared Scops Owl†	*Otus bakkamoena*	P	
54. Collared Owlet†	*Glaucidium brodiei*	P	
55. AsianBarred Owlet†	*Glaucidium cuculoides*	P	
56. Spotted Owlet†	*Athene brama*	P	
Family Eurostopodidae			
57. Great Eared Nightjar†	*Eurostopodus macrotis*	P	
Family Caprimulgidae			
58. Large-Tailed Nightjar†	*Caprimulgus macuruus*	P	
59. Indian Nightjar	*Caprimulgus asiaticus*	P	
60. Savanna Nightjar†	*Caprimulgus affinis*	P	
Order Columbiformes			
Family Columbidae			
61. Rock Pigeon	*Columba livia*		
62. Spotted Dove	*Streptopelia chinensis*		
63. Red Collared Dove	*Streptopelia tranquebarica*	P	
64. Peaceful Dove	*Geopelia striata*		
65. Emerald Dove†	*Chalophaps indica*	P	
Order Ciconiiformes			
Family Charadriidae			
66. Red-wattled Lapwing	*Vanellus indicus*	P	
Family Accipitridae			
67. Black-shouldered Kite	*Elanus caeruleus*	P	
68. Crested Goshawk	*Accipiter trivergatus*	P	
69. Japanese Sparrowhawk	*Accipiter gularis*	P	
70. Besra	*Accipiter virgatus*	P	

Table 1 (Cont.)

Common name	Species name	Status	
		Act.[1]	ONEP[2]
Family Ardeidae			
71. Little Egret	*Egretta garzetta*	P	
72. Cattle Egret	*Bubulcus ibis*	P	
73. Chinese Pond Heron	*Ardeola bacchus*	P	
Order Passeriformes			
Family Pittidae			
74. Blue-winged Pitta†	*Pitta moluccensis*	P	
Family Eurylaimidae			
75. Dusky Broadbill†	*Corydon sumatranus*	P	
76. Black and Red Broadbill†	*Cymbirhynchus macroorhychus*	P	
Family Irenidae			
77. Fairy Bluebird†	*Irena puella*	P	
78. Blue-winged Leafbird†	*Chloropsis cochinchinensis*	P	
79. Golden-fronted Leafbird†	*Chloropsis aurifrons*	P	
Family Laniidae			
80. Brown Shrike	*Lanius cristatus*	P	
81. Long-tailed Shrike†	*Lanius schach*	P	
Family Corvidae			
82. Racket-tailed Treepie	*Crypsirina temia*	P	
83. Large-billed Crow	*Corvus macrorhynchos*	P	
84. Ashy Wood swallow	*Artamus fuscus*	P	
85. Black-naped Oriole	*Oriolus chinensis*	P	
86. Black-winged Cuckooshrike†	*Coracina melashistos*	P	
87. Scarlet Minivet†	*Pericrocotus flammeus*	P	
88. Bar-winged Flycatcher Shrike†	*Hemipus picatus*	P	
89. Pied Fantail	*Rhipidura javanica*	P	
90. Black Drongo	*Dicrurus macrocercus*	P	
91. Ashy Drongo	*Dicrurus leucophaeus*	P	
92. Spangked Drongo†	*Dicrurus hottentotus*	P	
93. Greater Racket-tailed Drongo	*Dicrurus paradiseus*	P	
94. Black-naped Monarch Flycatcher†	*Hypothymis azurea*	P	
95. Common Iora	*Aegithina tiphia*	P	
96. Great Iora†	*Aegithina lafresnayei*	P	
97. Large Woodshrike	*Tephrodornis gularis*	P	
Family Muscicapidae			
98. Asian Brown Flycatcher	*Muscicapa dauurica*	P	
99. Red-throated Flycatcher	*Ficedula parva*	P	
100. Oriental Magpie Robin	*Copsychus saularis*	P	

Table 1 (Cont.)

Common name	Species name	Status	
		Act.[1]	ONEP[2]
101. White-rumpedShama	*Copsychus malabaricus*	P	
102. Common Stonechat†	*Saxicola torquata*	P	
Family Sturnidae			
103. White-shouldered Starling†	*Sturnus sinensis*	P	
104. AsianPied Starling†	*Sturnus contra*	P	
105. Black-collared Starling	*Sturnus nigricollis*	P	
106. Common Myna	*Acridotheres tristis*	P	
107. White-vented Myna	*Acridotheres cinereus*	P	
108. Hill Myna†	*Gracula religiosa*	P	NT
Family Sittidae			
109. Velvet-Fronted Nuthatch	*Sitta frontalis*	P	
Family Hirundinidae			
110. Barn Swallow	*Hirundo rustica*	P	
111. Red-Rumped Swallow†	*Hirundo daurica*	P	
Family Pycnonotidae			
112. Black-Headed Bulbul†	*Pycnonotus atriceps*	P	
113. Black-crested Bulbul	*Pycnonotus melanicterus*	P	
114. Red-whiskered Bulbul	*Pycnonotus jocosus*	P	NT
115. Sooty-headed Bulbul	*Pycnonotus aurigaster*	P	
116. Yellow-vented Bulbul	*Pycnonotus goiavier*	P	
117. Streak-eared Bulbul	*Pycnonotus blanfordi*	P	
118. Ochraceous Bulbul	*Alophoixus ochraceus*	P	
Family Cisticolidae			
119. Rufescent Prinia	*Prinia rufescens*	P	
120. Grey-breasted Prinia	*Prinia hodgsonii*	P	
121. Plain Prinia	*Prinia inornata*	P	
Family Zosteropidae			
122. Oriental White-Eye†	*Zosterops palpebrosus*	P	
Family Sylviidae			
123. Common Tailorbird	*Orthotomus sutorius*	P	
124. Dark-necked Tailorbird	*Orthotomus atrogularis*	P	
125. Dusky Warbler†	*Phylloscopus fuscatus*	P	
126. Yellow-browed Warbler†	*Phylloscopus inornatus*	P	
127. Greenish Warbler†	*Phylloscopus trochiloides*	P	
128. Pale-legged Leaf Warbler	*Phylloscopus tenellipes*	P	
129. Puff-throated Babbler	*Pellorneum ruficeps*	P	
130. Striped Tit-Babbler†	*Macronous gularis*	P	
Family Alaudidae			
131. Rufous-winged Bushlark	*Mirafra assamica*	P	

Table 1 (Cont.)

Common name	Species name	Status	
		Act.[1]	ONEP[2]
Family Nectariniidae			
132. Thick-billed Flowerpecker	*Dicaeum agile*	P	
133. Yellow-Vented Flower-pecker†	*Dicaeum chrysorrheum*	P	
134. Scarlet-backed Flowerpecker	*Dicaeum cruentatum*	P	
135. Brown-throated Sunbird	*Anthreptes malacensis*	P	
136. Ruby-cheeked Sunbird†	*Anthreptes singalensis*	P	
137. Purple-Throated Sunbird†	*Nectarinia sperata*	P	
138. Olive-backed Sunbird	*Nectarinia jugularis*	P	
139. Crimson Sunbird	*Aethopyga siparaja*	P	
140. Little Spiderhunter	*Arachnothera longirostra*	P	
Family Passeridae			
141. Forest Wagtail†	*Dendronanthus indicus*	P	
142. White Wagtail	*Motacilla alba*	P	
143. Grey Wagtail†	*Motacilla cinerea*	P	
144. Plain-backed Sparrow	*Passer flaveolus*	P	
145. Eurasian Tree Sparrow	*Passer montanus*		
146. Baya Weaver†	*Ploceus philippinus*	P	NT
147. Richard's Pipit	*Anthus richardi*	P	
148. Paddyfield Pipit	*Anthus rufulus*	P	
149. Olive-backed Pipit	*Anthus hodgsoni*	P	
150. White-rumpedMunia	*Lonchura striata*	P	
151. Scaly-breasted Munia	*Lonchura punctulata*	P	
Class Mammalia			
Order Lagomorpha			
Family Leporidae			
152. Siamese Hare†	*Lepus pequensis*	P	
Order Rodentia			
Family Sciuridae			
154 Finlayson's Squirrel	*Callosciurus finlaysonii*		
155. Indochinese Ground Squirrel	*Menetes berdmorei*		
Family Muridae			
156. Bandicoot†	*Bandicota indica*		
157. Indomalayan Maxomys	*Maxomys surifer*		
158. Hoary Bamboo Rat†	*Rhizomus pruinosus*		LC
Family Hystricidae			
159. Malayan Porcupine†	*Hystrix brachyura*	P	LC
Order Pholidota			
Family Manidae			
160. Sunda Pangolin†	*Manis javanica*	P	NT

Table 1 (Cont.)

Common name	Species name	Status	
		Act.[1]	ONEP[2]
Order Carnivora			
Family Felidae			
161. Jungle Cat†	*Felis chaus*	P	CR
162. Leopard Cat†	*Prionailurus bengalensis*	P	
163. Fishing Cat†	*Prionailurus viverrina*	P	VU
Family Viverridae			
164. Small Indian Civet†	*Viverricula indica*	P	
165. Asian Palm Civet	*Paradoxurus hermaphrodites*	P	
Family Herpestidae			
166. Small Asian Mongoose	*Herpestes javanicus*	P	
Order Eulipotyphla			
Family Soricidae			
167. Asian Gray Shrew	*Crocidura attenuata*		
Order Chiroptera			
Family Pteropodidae			
168. Lyles'Flying Fox†	*Pteropus lylei*	P	NT
Order Primates			
Family Cercopithecidae			
169. Indochinese Lutung†	*Trachypithecus germaini*	P	NT
170. Northern Pig-tailed Macaque†	*Macaca leonina*	P	
171. Crab-eating Macaque	*Macaca fascicularis*	P	
Oeder Scandentia			
Family Tupaiidae			
172. NorthernTreeshrew†	*Tupaia belangeri*	P	
Order Artiodactyla			
Family Suidae			
173. Wild Boar†	*Sus scrofa*		
Family Tragulidae			
174. Lesser Mouse Deer†	*Tragulus kanchil*	P	

† = Species reported by Thammich *et al.* (1992) but not seen in the current study.

[1] = Status according to the Wildlife Reservation and Conservation Act B.E. 2535 (A.D.1992) (Wildlife Conservation Office, 2010); P = protected species.

[2] = Status according to ONEP (2007); CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern and DD = Data Deficient species.

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