

COMPOSITION OF THE VERTEBRATE FAUNA IN THREE TANE-ZONE PROTECTED AREAS OF SRI LANKA

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Abstract

A total of 176 species were found, of which 44 are endemic, and 86 in some degree "threatened". Variations in species diversity between the three areas are discussed. The survey shows the pressing need to protect the habitats

Introduction

Sri Lanka, although it is only a small island of 65,610 km², harbours a rich assemblage of vertebrate fauna. At species level it has 65 (29 endemic) inland fishes (Pethiyagoda, 1991), 53 (31 endemic) amphibians (Dutta & Manamendra-Arachchi, 1996), 149 (84 endemic) inland reptilians (De Silva, 1994), 237 (26 endemic) resident birds (Wijesinghe, 1994) and 85 (12 endemic) mammals (Phillips, 1984), making a total of 589 inland vertebrates, of which 182 (31%) are endemic. Most of the endemic vertebrates occur in the forests of the montane zone and the wet south-western parts of the island (Senanayake et al, 1977; Cruz, 1984).

Compared with the number of faunal studies in the low-country wet and dry zones, only a few have previously been carried out to document the composition of the vertebrate fauna in the montane zone. Werner & Schweinfurth (1985) recorded 21 endemic bird species from the Peak Wilderness and the contiguous Horton Plains. Wilson (1988) recorded some species of mammals from Horton Plains. Senanayake et al. (1977) recorded many species of endemic amphibians, lizards and birds from the montane region.

The present study was carried out to investigate and compare the species composition of the vertebrate fauna in three montane-zone protected areas (PAs): the Hakgala Strict Nature Reserve (HSNR – 1142 ha), Horton Plains National Park (HPNP – 3160 ha), and the Peak Wilderness Sanctuary (PWS – 22,380 ha). The HPNP is on a gently undulating plateau at 2100-2389 m, adjoining the eastern edge of the PWS. It consists of wet patana grassland, fringed and interspersed with patches of dense montane cloud forest (IUCN, 1990). It is dominated to the north by Mt Thotupolakande (2357 m) and to the west by Mt Kirigalpotta (2389 m), respectively Sri Lanka's third and second highest peaks. The HSNR (1650-2178 m) lies on the south bank of the Sita Eliya, and consists of a botanically rich montane cloud forest (IUCN, 1990). The reserve almost

entirely covers the Hakgala massif with its three prominent peaks, among the highest in the country. The PWS contains three major forest formations which are continuous and altitudinally graded: lowland rain forest (50-900 m), sub-montane rain forest (900-1500 m), and montane cloud forest (above 1500 m).

In all three forests the mean annual rainfall is more than 2500 mm. Temperatures are low in the HSNR and the HPNP (annual mean 13-15°C). The annual mean in the PWS ranges from 27° in the lowlands to 15° in the highlands (IUCN, 1990).

Materials and methods

The study was conducted from April to October 1995. Vertebrate fauna were investigated along seven different pre-determined trails in each PA (Fig. 1). Systematic searches were carried out along each trail, and all major habitats were thoroughly surveyed. Nocturnal searches were also carried out. The presence of different groups of vertebrates was recorded by direct visual observation, and also by indirect evidence such as foot-prints, territorial marks, faecal matter (mammals), and calls and songs (birds). Small mammals were trapped. Leopard scats were analysed to identify prey animals by hair and bone remains. Vertebrates observed in these three PAs in other studies from 1980 onwards were also included in the final lists.

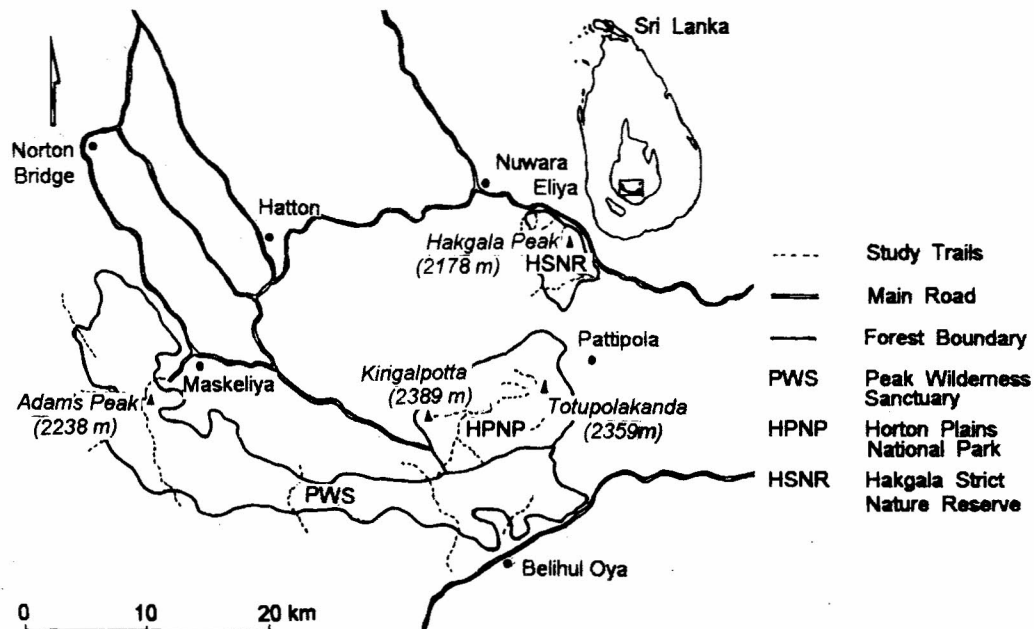


Figure 1: Location of the three study areas

The qualitative data on the birds was used to indicate species richness and beta diversity in each PA. The cumulative total of the numbers of additional species recorded along each trail (transect) was plotted on a graph, to produce a species diversity curve whose steepness reflects the species richness for each PA (Krebs, 1989). The degree of change in species composition between the PAs (beta diversity) was calculated by Whittaker's index: $B = S/\alpha - 1$, while the degree of similarity between the bird communities in each pairing of the three PAs was calculated by Jaccard's index: $C = j/a + b - c$ (Magurran, 1988).

Results

In all, 176 species of vertebrates, including 44 endemic species, were recorded during the study. These observations, together with published data from previous studies, gave a total of 216 species of vertebrates in these three PAs, of which 74 species are endemic to Sri Lanka (see Appendix). These come to 34% of the total number of inland vertebrate species (excluding exotic forms and winter migrants) and 41% of the endemics. Of the total endemic species recorded, 19 are relict forms. The endemic species recorded in the three PAs, as a percentage of the total number of endemic vertebrate species in the island, are: fishes 34.5%, amphibians 51.6%, reptiles 18%, birds 92%, and mammals 75%. Fig. 2 shows a comparison of vertebrate numbers in the three PAs.

Fig. 3 shows the species composition of the vertebrate fauna, on the basis of the total numbers of species recorded. The total number of vertebrates and endemics in each PA are: HSNR 119 (40 endemics = 34%), HPNP 87 (27 endemics = 31%), and PWS 174 (56 endemics = 32%). Twenty-one species (9.7%) are exclusive to the HSNR, 10 species (4.6%) to the HPNP, and 85 species (39%) to the PWS, while 64 species (30%) are common to all three PAs. Fig. 4 shows the species diversity curves for the birds, and Table 1 shows the corresponding beta diversity measurements. The higher values of Whittaker's index indicate a greater variation in species composition in a community, while higher values of Jaccard's index indicate greater similarity between bird communities in two forests.

Table 1 : Beta diversity measurements of avifauna

	HSNR	HPNP	PWS
Total no. of bird species (present study)	61	47	98
Mean number of species per transect	25.84 ± 4.81	21.85 ± 5.11	39.71 ± 12.89
Whittaker's index	1.35	1.15	1.46
Forest pairs	HSNR & HPNP	HSNR & PWS	HPNP & PWS
Total number of species common to each forest pair	41	47	36
Jaccard's index	0.61	0.41	0.33

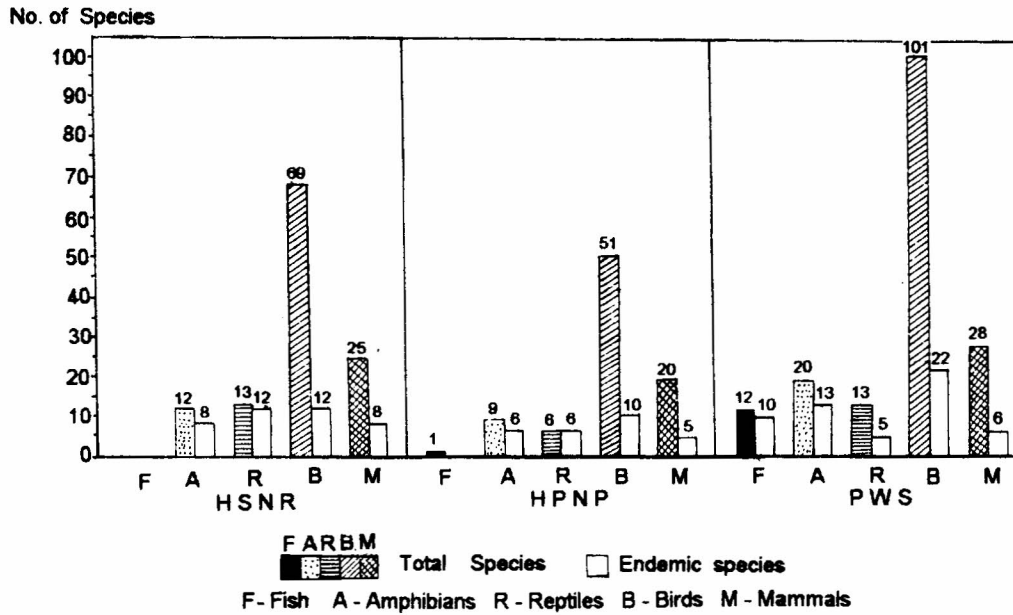


Figure 2: Comparison of vertebrates in the three PA's

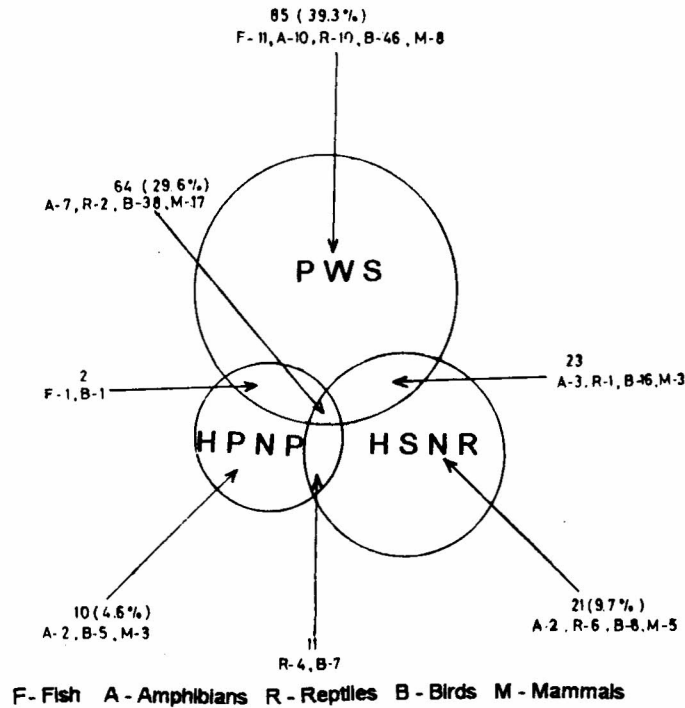


Figure 3: Species composition of vertebrates in the three PA's

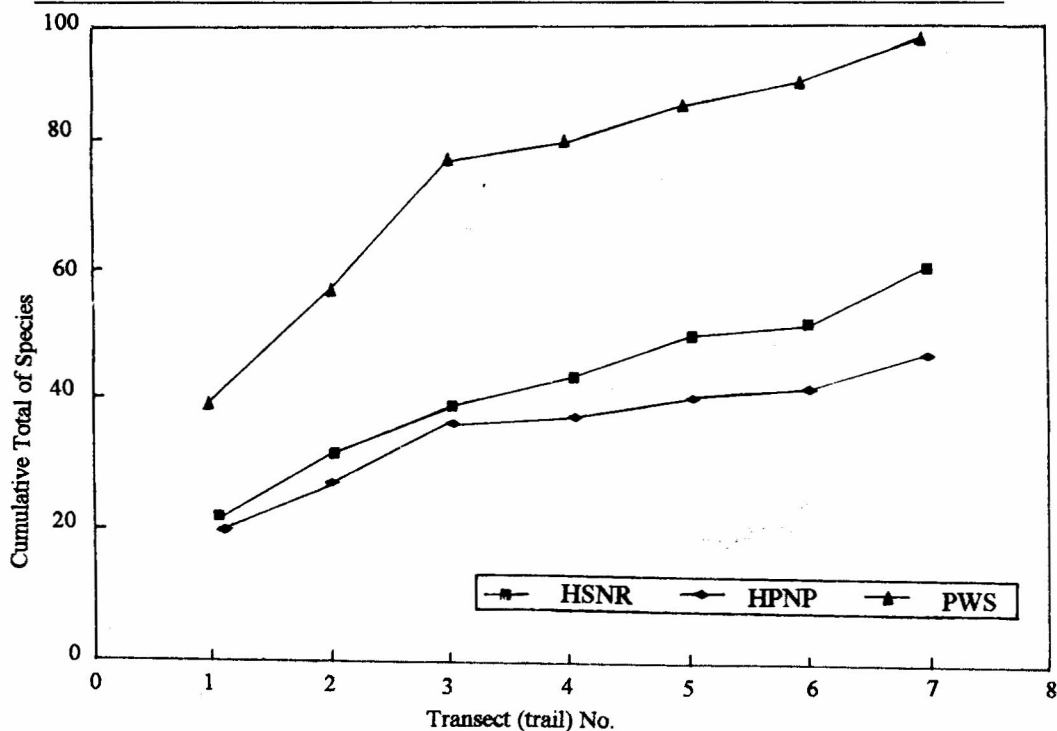


Figure 4: Species diversity curves showing species richness of avifauna

Discussion

The study shows that these montane-zone PAs harbour a rich vertebrate fauna, with a higher percentage of endemic species. Although Crusz (1984) stated that only about 25% of the endemic fauna is confined to the upper montane zone, this study shows that 41% of the endemic vertebrates occur in these PAs, mostly in this zone. A possible reason for this apparent increase in endemics in the montane region may be the recent description of new endemic species of amphibians and reptiles. It is also interesting that these montane-zone PAs harbour many relict vertebrates, which are living memorials of environments that have for various reasons disappeared (Crusz, 1984). Senanayake et al. (1977) made quantitative estimates of habitat values and endemism for the fauna of the rain forests of Sri Lanka, and showed that the habitat values of the wet montane region were relatively high. These facts, relating to the remarkable endemism rates, point to the unusual interest of these montane zone PAs.

Figures 2, 3, and 4 clearly indicate that the species composition and richness values of the vertebrate fauna in the PWS are relatively high, compared with those of the HSNR and HPNP. Further evidence is to be found in the degree of change in species composition of the avifauna between the forests (Whittaker's index of beta diversity), where the values clearly indicate that the birds in the PWS show a greater diversity and variation than those of the other two PAs. The main factor which contributes to the higher species composition and

richness of vertebrate fauna in the PWS is likely to be the continuity of the tracts of altitudinally graded forest, which link the forests of the highest altitudes with the remaining forests of the low country wet zone, providing a pathway for the movement of vertebrate species. This sanctuary also consists of a more varied mosaic of habitats, when compared with the other two forests, and this habitat variation could also be a contributing factor to the high faunal diversity.

Although observations were made in many streams, especially in the HPNP and PWS, only a few species of fish were recorded during the study. However, Gunawardena (1994) had found 16 endemic fish species (including the relict monotypic genus *Malpulutta*) in the aquatic habitats of the PWS. The presence of two exotic carnivorous fishes, the rainbow trout (*Oncorhynchus mykiss*) in the Rajamalai area (Pethiyagoda, 1991) and the common guppy in lowland border areas (*Poecilia reticulata*) can be detrimental to the native endemic fishes; damage has already taken place in the HPNP.

Many important species of endemic and relict herpetofauna are found in these three montane-zone PAs (reptile genera: *Ceratophora*, *Lyriocephalus*, *Aspidura*; there is also one amphibian genus: *Nannophrys*). Many of these endemic species were found to comprise small localized populations. A characteristic feature of the amphibian fauna in the three PAs was the dominance of rhacophorids (tree frogs), which were generally observed in the short understorey layer and on the ground surface, which is moist and covered with leaf litter. It is known that rhacophorids of the genera *Rhacophorus* and *Philautus* lay eggs in the moist forest floor in Sri Lanka, and that the eggs undergo direct development to adult frogs, without a free-living aquatic tadpole stage. The epiphytic lichens, mosses and liverworts in these forests are very important to the amphibians, because they have the ability to collect water from the mist (Mueller-Domboi, 1972), making a valuable contribution to the high humidity.

Foraging bird flocks of mixed species were commonly observed in all three PAs. A single flock might consist of from four to twenty species, and from ten to sixty individuals. The lowland rain forest areas of the PWS harboured a higher number of mixed-species flocks than the other areas. The Jaccard index indicates that there is more similarity between the bird communities of the HSNR and HPNP than there is between either of them and that of the PWS. Both HPNP and HSNR consist of montane cloud forest at more than 1650 m, and this may be the reason for the greater degree of similarity in these two forests.

The PWS appears to be the last refuge of elephants (*Elephas maximus*) in the montane zone; a small group of them (6-8 individuals) roam in the sub-montane forest region (700-1400 m). The leopard (*Panthera pardus fusca*) inhabits all three PAs in small numbers; scat analysis showed that the sambar (*Cervus unicolor*) and the purple-faced leaf monkey (*Presbytis senex*) are its common prey animals (Ranawana et al, 1996).

Today, the montane zone vertebrates and their habitats are faced with several threats. The natural forest die-back phenomenon (Werner, 1988) observed in some parts of all three PAs, and the over-exploitation of bamboo species (*Ochlandra* spp. and *Indocalamus* spp.), result in the opening of the canopy and desiccation of the moist forest floor, which have adverse effects on the localized populations of ground-dwelling reptiles. In the PWS the four pilgrim

trails (Nullathanniya, Palabaddella, Hapugastenne, and Erathna) leading to the peak are cleared during the annual pilgrim season (December-May) and temporary stalls and huts are erected. Collection of firewood and construction poles for these stalls causes considerable damage to the vegetation and to the habitats of the vertebrates. The loud noises and music during this season further disturb the animals. Intensive use of agro-chemicals was observed in the agricultural lands bordering these forests. These chemicals accumulate in aquatic habitats and can therefore be detrimental to fish and amphibians. Natural or man-made forest fires (observed in all three PAs) destroy many vertebrates and their habitats. Human encroachment still continues around all three PAs.

Conclusion

The study shows that these three montane zone PAs are habitats of many important vertebrates of Sri Lanka. It is alarming that 86 species (40%) of the vertebrates recorded here are already considered as nationally threatened (Wijesinghe et al., 1993). Even more alarming is the fact that (as at 1983) only 17.8% of the montane zone was forested, of which only 3% was considered to be relatively undisturbed (Gunatilleke & Gunatilleke, 1983). With the increasing human pressure, the condition of these remaining montane-zone forests is probably even worse today. These facts point to the importance of conserving the few remaining montane zone forests, in order to ensure the survival of these vulnerable vertebrate species. At least a part of the PWS (excluding the area around Adam's Peak itself) should be upgraded to Strict Nature Reserve, so that better protection can be provided.

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**Appendix – Vertebrate species in the three protected areas,
based on records from the present survey and previous studies**

Studies cited: (1) Present survey, (2) Dutta & Manamendra-Arachchi (1996), (3) Gunawardena (1994), (4) Pethiyagoda (1991), (5) De Silva (1990), (6) IUCN (1990), (7) Wilson (1988), (8) Werner & Schweinfurth (1985), (9) Gans (1995).

Status: E – endemic; R – relict; Ex – exotic; NT – nationally threatened; WM – winter migrant;

* – IUCN red list.

FISHES

Family/species	HSNR	HPNP	PWS	Status
Cyprinidae				
<i>Garra ceylonensis</i>	-	-	1, 3	E, NT
<i>Puntius nigrofasciatus</i>	-	-	3	E, NT*
<i>P. titteya</i>	-	-	3	E, NT* E,
<i>P. cumingi</i>	-	-	3	NT* E, NT*
<i>Rasbora vaterifloris</i>	-	-	3	
Cobitidae				
<i>Lepidocephalichthys jonklaasi</i>	-	-	3	E, NT*
Belontiidae				
<i>Belontia signata</i>	-	-	1, 3	E, NT*
<i>Malpulutta kretseri</i>	-	-	3	E, R, NT*
Balitoridae				
<i>Schistura notostigma</i>	-	-	3	E, NT
<i>Acanthocobitus urophthalmus</i>	-	-	3	E, NT
Salmonidae				
<i>Oncorhynchus myskiss</i>	-	1, 4	4	Ex
Poeciliidae				
<i>Poecilia reticulata</i>	-	-	1	Ex
Total recorded (6 families, 12 species)	-	1	12	10E, 2Ex 10NT 1R, 7*
Species exclusive to one PA	-	-	11	

AMPHIBIANS

Family/species	HSNR	HPNP	PWS	Status
Bufonidae				
<i>Bufo melanostictus</i>	-	-	1	-
<i>B. kelaarti</i>	6	-	1, 2	E, NT
<i>B. microtympanum</i>	-	-	1	-
Microhylidae				
<i>Microhyla zeylanica</i>	2, 6	-	-	E, NT
<i>Ramanella palmata</i>	2, 6	-	-	E, NT
Ranidae				
<i>Limnonectes corrugatus</i>	-	-	1, 2	E, NT
<i>L. limnocharis</i>	1, 6	-	1	-
<i>L. greeni</i>	2	1	1	E, NT
<i>L. kirtisinghei</i>	-	-	2	E
<i>Euphlyctis hexadactyla</i>	-	-	2	-
<i>Nannophrys ceylonensis</i>	-	-	2	E, R, NT
<i>Rana temporalis</i>	1, 2	-	1, 2	-
Rhacophoridae				
<i>Rhacophorus microtympanum</i>	1, 6	1	1	E, NT
<i>R. reticulatus</i>	-	-	2	E, NT
<i>Polypedates cruciger</i>	1, 6	1	1	E, NT
<i>P. eques</i>	1	1	1	E, NT
<i>P. longinasus</i>	-	1	-	E, NT
<i>Philautus temporalis</i>	-	-	2	E, NT
<i>P. femoralis</i>	-	2	-	-
<i>P. variabilis</i>	1, 2	1, 2	1, 2	-
<i>P. eximius</i>	-	-	2	E
<i>P. leucorhinus</i>	1	1	1	-
<i>P. nasutus</i>	-	-	1	E, NT
<i>Theloderma schmardamum</i>	6	2	2	E, NT
Total recorded (4 families, 24 species)	12	9	20	16E, 1R 14NT
Species exclusive to one PA	2	2	10	

REPTILES

Family/species	HSNR	HPNP	PWS	Status
Agamidae				
<i>Calotes calotes</i>	1	-	1	NT
<i>C. versicolor</i>	-	-	1	-
<i>C. nigrilabris</i>	1, 6	1, 6	-	E, NT
<i>Cophotis ceylanica</i>	1, 6	1	-	E, NT
<i>Otocryptis weigmanni</i>	-	-	1	E, NT
<i>Ceratophora stoddarti</i>	1, 6	1	1	E, R, NT
<i>Lyriocephalus scutatus</i>	-	-	1, 8	E, R, NT
Scincidae				
<i>Sphenomorphus striatopunctatus</i>	6	-	-	E, NT
<i>Lankascincus taprohanensis</i>	9	-	-	E, NT
<i>Mabuya macularia</i>	-	-	1	NT

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Colubridae				
<i>Aspidura trachyprocta</i>	1, 6	1	-	E, R, NT
<i>A. brachyrrhos</i>	1, 6	6	-	E, R, NT
<i>Playas mucosus</i>	-	-	1	-
<i>Ahaetulla nasuta</i>	-	-	1	-
Elapidae				
<i>Naja naja</i>	-	-	1	-
<i>Bungarus ceylonicus</i>	5	5	1	E, NT
Viperidae				
<i>Daboia russellii</i>	-	-	1	-
<i>Hypnale hypnale</i>	-	-	1	NT
<i>H. nepa</i>	5	-	-	E, R, NT
<i>H. walli</i>	5	-	-	E, R, NT
<i>Trimeresurus trigonocephalus</i>	-	-	1	E, NT
Uropeltidae				
<i>Uropeltis melanogaster</i>	5	-	-	E, NT
<i>Rhinophis blythi</i>	5	-	-	E, NT
Total recorded (6 families, 23 species)	13	6	13	15E, 6R 18NT
Species exclusive to one PA	6	--	10	

BIRDS

Family/species	HSNR	HPNP	PWS	Status
Muscicapidae				
<i>Eumyias sordida</i>	1, 6	1, 6	1	E, NT
<i>Culicicapa ceylonensis</i>	1, 6	1	1	-
<i>Cyornis tickelliae</i>	-	-	1	-
<i>Hypothymis azurea</i>	1	-	1	-
<i>Rhipidura aureola</i>	1	-	-	-
<i>Terpsiphone paradisi</i>	-	-	1	-
<i>Ficedula subrubra</i>	1, 6	-	-	WM
<i>Muscicapa daurica</i>	1, 6	-	1	WM
<i>Orthotomus sutorius</i>	1	1	1	-
<i>Phylloscopus magnirostris</i>	1, 6	1	1	WM
<i>Copsychus malabaricus</i>	-	-	1	-
<i>C. saularis</i>	1	-	1	-
<i>Pomatorhinus horsfieldi</i>	1, 6	1	1	-
<i>Pellorneum fuscicapillum</i>	-	-	1	E, R
<i>Rhopocichla atriceps</i>	1	1	1	-
<i>Dumetia hyperythra</i>	-	-	1	-
<i>Turdoides rufescens</i>	6	1, 6	1	E, NT
<i>T. affinis</i>	-	-	1	-
<i>Bradypterus palliseri</i>	1, 6	1, 6	1	E, R, NT*
<i>Zoothera spiloptera</i>	6	-	1	E, R, NT*
<i>Z. wardii</i>	6	-	1	WM
<i>Z. dauma</i>	6	-	-	NT
<i>Myiophoneus blighi</i>	1, 6	6	6	E, R, NT*
<i>Turdus merula</i>	1, 6	1	-	-
<i>Saxicola caprata</i>	1, 6	1	-	-
<i>Cisticola juncidis</i>	1	1	-	-
<i>Prinia sylvatica</i>	1	-	1	-
<i>P. inornata</i>	1	-	1	-
<i>P. socialis</i>	1	-	1	-

<i>Luscinia brunnea</i>	6	-	-	WM
Accipitridae				
<i>Elanus caeruleus</i>	1	1, 6	1	-
<i>Spilornis cheela</i>	1	1, 6	1	-
<i>Ictinaetus malayensis</i>	-	1	-	NT
<i>Spizaetus nipalensis</i>	1	1, 6	-	NT
<i>Circus macrourus</i>	-	1	-	WM
<i>C. aeruginosus</i>	-	1	-	WM
<i>Accipiter badius</i>	-	-	1	-
Falconidae				
<i>Falco peregrinus</i>	-	6	-	NT
Pycnonotidae				
<i>Pycnonotus cafer</i>	1	1	1	-
<i>P. melanicterus</i>	-	-	1	E
<i>P. penicillatus</i>	1, 6	1, 6	1	E, R, NT
<i>Hypsipetes leucocephalus</i>	1, 6	1	1	-
<i>Iole indica</i>	1	-	1	-
Columbidae				
<i>Treron pompadora</i>	-	-	1	-
<i>Ducula aenea</i>	-	-	1	-
<i>Columba torringtoni</i>	1, 6	1, 6	-	E, NT*
<i>Streptopelia chinensis</i>	1	1	1	-
<i>Chalcophaps indica</i>	-	1	1	-
<i>Columba livia</i>	1	1	1	-
Psittacidae				
<i>Psittacula calthropae</i>	-	-	1	E
<i>P. krameri</i>	-	-	1	-
<i>P. eupatria</i>	-	-	1	-
<i>P. cyanocephala</i>	-	-	1	-
<i>Loriculus beryllinus</i>	-	-	1	E
Picidae				
<i>Dinopium benghalense</i>	-	-	1	-
<i>Chrysocolaptes lucidus</i>	1	1	1	-
<i>Picus xanthopygaeus</i>	1	1	1	NT
<i>P. chlorolophus</i>	-	-	1	-
Corvidae				
<i>Urocissa ornata</i>	6	6, 8	1, 3	E, R, NT*
<i>Corvus macrorhynchos</i>	1	1	1	-
Cuculidae				
<i>Centropus sinensis</i>	1	1	1	-
<i>C. chlororhynchus</i>	-	-	1, 6, 8	E, NT *
<i>Eudynamis scolopacea</i>	-	-	1	-
<i>Phaenicophaeus pyrocephalus</i>	-	-	1	E, NT *
Campephagidae				
<i>Pericrocotus flammeus</i>	1, 6	1	1	-
<i>P. cinamomeus</i>	1, 6	1	1	-
<i>Coracina macei</i>	-	-	1	-
<i>Hemipus picatus</i>	1	1	1	-
Epodidae				
<i>Collocalia unicolor</i>	1, 6	1	1	-
<i>Apus affinis</i>	-	-	1	-

<i>Hemiprocne coronata</i>	-	-	1	-
Hirundinidae				
<i>Hirundo dumicola</i>	1	1	1	-
<i>H. daurica</i>	-	-	1	-
<i>H. rustica</i>	1	1	1	WM
Nectarinidae				
<i>Nectarinia asiatica</i>	1	1	1	-
<i>N. zeylanica</i>	1	1	1	-
<i>N. lotenia</i>	-	-	1	-
Sturnidae				
<i>Gracula religiosa</i>	-	-	1	-
<i>G. ptilogenys</i>	-	-	1, 6, 8	E, NT
<i>Acridotheres tristis</i>	1	1	1	-
<i>Sturnus senex</i>	-	-	1, 6, 8	E, NT *
Phasianidae				
<i>Gallus lafayetti</i>	1, 6	1, 6	1	E, NT
<i>Galloperdix bicalcarata</i>	6	6, 8	6, 8	E, NT
Ploceidae				
<i>Passer domesticus</i>	1	-	1	-
<i>Lonchura punctulata</i>	1	-	1	-
<i>L. striata</i>	-	-	1	-
<i>L. kelaarti</i>	1, 6	-	-	E, NT
Zosteropidae				
<i>Zosterops ceylonensis</i>	1, 6	1, 6, 8	1, 6, 8	E
<i>Z. palpebrosus</i>	1	-	1	-
Irenidae				
<i>Chloropsis cochinchinensis</i>	-	-	1	-
<i>C. aurifrons</i>	-	-	1	-
<i>Aegithina tiphia</i>	-	-	1	-
Alaudidae				
<i>Alaudida gulgula</i>	1	1	-	-
<i>Anthus rufulus</i>	1	1	-	-
Motacillidae				
<i>Motacilla cinerea</i>	1	1	1	WM
<i>M. flava</i>	1	-	-	WM
Strigidae				
<i>Glaucidium radiatum</i>	-	-	1	-
<i>Ketupa zeylonensis</i>	-	-	1	-
Dicaeidae				
<i>Dicaeum erythrorhynchos</i>	1	1	1	-
<i>D. vincens</i>	-	-	1, 3	E, R, NT*
Capitonidae				
<i>Megalaima ceylanica</i>	1	-	1	-
<i>M. rubricapilla</i>	-	-	1	E, NT
<i>M. flavifrons</i>	-	-	1	E
Dicruridae				
<i>Dicrurus paradiseus</i>	-	-	1	-
<i>D. caerulescens</i>	-	-	1	-

Trogonidae

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<i>Harpactes fasciatus</i>	-	-	1	NT
Caprimulgidae				
<i>Caprimulgus indicus</i>	1, 6	1	1	-
Lanidae				
<i>Lanius cristatus</i>	1	-	1	WM
Meropidae				
<i>Merops leschenaulti</i>	-	-	1	-
Sittidae				
<i>Sitta frontalis</i>	1	1	1	-
Paridae				
<i>Parus major</i>	1	1	1	-
Pittidae				
<i>Pitta brachyura</i>	6	-	1	WM
Charadriidae				
<i>Vanellus indicus</i>	-	1	-	-
Alcedinidae				
<i>Halcyon smyrnensis</i>	1	-	1	-
Scolopacidae				
<i>Tringa hypoleucos</i>	1	-	-	WM
Bucerotidae				
<i>Ocyrceros gingalensis</i>	-	-	1	E, NT
Oriolidae				
<i>Oriolus xanthornus</i>	-	-	1	-
Turnicidae				
<i>Turnix suscitator</i>	-	-	1	-
Coraciidae				
<i>Eurystomus orientalis</i>	-	-	6	NT
Total recorded (39 families, 121 species)	69	51	101	24E, 7R 25NT 13WM, 9*
Species exclusive to one PA	8	5	46	

MAMMALS

Family/species	HSNR	HPNP	PWS	Status
Cervidae				
<i>Cervus unicolor</i>	1, 6	1, 6, 7	1	-
<i>Tragulus meminna</i>	1	1, 7	1	NT
<i>Muntiacus muntjak</i>	1	1, 8	1	-
Bovidae				
<i>Bubalus bubalis</i>	1	-	-	EX
Lorisidae				
<i>Loris tardigradus</i>	-	7, 8	-	NT
Cercopithecidae				
	1, 6	1, 7, 8	1, 6	E, NT

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<i>Presbytis senex</i>	1, 6	1, 7, 8	1, 6	E
<i>Macaca sinica</i>				
Sciuridae				
<i>Ratufa macroura</i>	1, 6	1, 6	1	-
<i>Finnambulus palmarum</i>	-	-	1	-
<i>F. layardi</i>	1	1	1	NT
<i>F. sublineatus</i>	1	1	1	NT
<i>Petaurista petaurista</i>	6	-	3	NT
Histricidae				
<i>Hystrix indica</i>	1	-	1	-
Muridae				
<i>Bandicota indica</i>	-	-	1	-
<i>Rattus montanus</i>	1	1	1	E, NT
<i>Srilankamys ohienensis</i>	1, 6	1	1	E, R, NT
<i>Coelomys mayori</i>	6	-	-	E, R, NT
Leporidae				
<i>Lepus nigricollis</i>	1	1	1	-
Soricidae				
<i>Feroculus feroculus</i>	6	8, 6	1, 6	E, R, NT
<i>Solisorex pearsoni</i>	6	-	-	E, R, NT
<i>Crocidura mya</i>	6	-	-	E, NT
Mustelidae				
<i>Lutra lutra</i>	1	1, 6	1	NT
Canidae				
<i>Canis aureus</i>	1	-	1	-
Felidae				
<i>Felis rubiginosa</i>	-	7	-	NT*
<i>F. viverrina</i>	1, 6	7	1	NT
<i>F. chaus</i>	-	-	1	NT
<i>Panthera pardus</i>	1	1, 7, 8	1, 6	NT*
Elephantidae				
<i>Elephas maximus</i>	-	-	1, 6	NT*
Viverridae				
<i>Viverricula indica</i>	-	-	1	-
<i>Herpestes fuscus</i>	1	1	1	-
<i>H. vitticollis</i>	-	8	-	NT
<i>Paradoxurus hermaphroditus</i>	-	-	1	-
<i>P. zeylonensis</i>	-	-	3	E, NT*
Pteropodidae				
<i>Pteropus giganteus</i>	-	-	1	-
Vespertilionidae				
<i>Pipistrellus mordax</i>	6	-	-	-
Suidae				
<i>Sus scrofa</i>	1, 6	1, 6, 8	1	-
Total recorded (17 families, 36 species)	25	20	28	9E, 4R 19NT
Species exclusive to one PA	5	3	8	1EX, 4*