

## Composition of bird species in Huu Lien Nature Reserve, Lang Son province

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**Abstract.** The diversity of bird species is of special importance as it can create responsive and adaptive behaviours among the whole animal population in wild environment. For this reason, the frequent making of inventory lists of bird species helps assess and evaluate the current status of forest resources in natural conservation areas which are inherently under human pressures in our country. During the two years (2009 - 2010) of the study conducted in Huu Lien Nature Reserve in Lang Son province, records have been made of 168 bird species belonging to 117 genus, 54 families, 17 orders. Of these, 9 bird species are rare and of high value of genetic preservation. Discussions have been held on the data for classification and arrangement of bird lists. This regional avifauna is characterized as typical of the lime stone mountain ecology in the Northeast of Vietnam along the border with China. The illegal activities of timbering *Burretiodendron hsienmu* take place at high frequency are making it a threat to the conservation of the diversity of bird species in this area.

**Keywords:** avifauna, lime stone mountain, rare species, timbering.

### 1. Introduction

Huu Lien Nature Reserve was recognized as in the Decision numbered 194/CT dated August 9<sup>th</sup> 1986 by the Council of Ministers. On June 10<sup>th</sup> 1989, at the Decision numbered 10/QĐ-NL by Lang Son Provincial People's Committee, the management board of Huu Lien Special-use Forest was established under the auspices of Lang Son Provincial Sub-department of forest protection. The project on investments in building Huu Lien Nature Reserve was approved in 1992 by the Ministry of Forestry, comprising of the natural area of 10.640

hectares and an buffer zone of another 10.000 hectares. On May 31<sup>st</sup> 2006, the Chairman of Lang Son People's Committee issued the decision numbered 705/QĐ-UBND on restructuring the management board of the Area and adjustment of its natural area to the minimum of 8.293,4 hectares. Huu Lien Nature Reserve is representative to the lime stone mountain ecology in the Northeast of the country. Forests in this area are of the type of closed forests covered with large green leaves of humid tropical trees. For this very reason, the primitive natural resources of animals and plants in Huu Lien are greatly diversified and varied with many unique features. Many animal species are newly detected here, such as

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*Goniurosaurus huulienensis*, *Gekko canhi* and *Scincella apraefrontalis*. The biological and ecological features of such rare plants as *Cupressus tonkinensis* or Dwarf musk deer (*Moschus berezovkii*) have been under initial study.

In order to make inventory lists and assess the diversity of bird composition in Huu Lien Nature Reserve, we have conducted the research study during the two year period of 2009 - 2010. The study findings will act as the reliable scientific basis for the management board of Huu Lien Nature Reserve and Lang Son province to work out preservation plans in a more effective manner.

## 2. Study methodology

### 2.1. Study site and timing

- Study sites: Huu Lien Nature Reserve is located in the southwest of Lang Son province, or the north of Huu Lung district, with geographical coordinates from 21°30' to 21°46'20" North parallels, and from 106°35'48" to 106°48'15" East longitudes. In terms of administrative location, Huu Lien Nature Reserve covers the whole of Huu Lien commune, part of Yen Thinh commune, part of Hoa Binh commune (of Huu Lung district), part of Huu Le commune (of Van Quang district) and part of Van Linh commune (of Chi Lang district), Lang Son province.

We established 5 main survey routes going through most of the key habitats in the area, including:

- Route 1 starting from the center of Huu Lien commune to Lan Dat, being 4 kilometers long. This line goes through the villages of Lang Ro, Lan Trong, Go Truc, Dong Lam, cross the lake of Giang Ca, creek of Lan Dat to Lan Dat village.

- Route 2 starting from the center of Huu Lien commune to Lan Chau, Lan Hoan (of Bac Son district) stretching 8 kilometers long. The line cuts through villages of Lang Cuom, Lang Coc, Lang Que, Tuc Tang, Lan Ram and Lan Chau. From Lan Chau to village of Lan Hoai, Lan Hoen (of Bac Son district).

- Route 3 starting from the center of Huu Lien commune to Lan Giang, covering the distance of 3 kilometers. The line gets through villages of Ba Leng, Bac Mo dam, the pass of Queo, the pass of Don, and then leads to Lan Gieng.

- Route 4 starting from the center of Huu Lien commune to Lan Ty, being 5 kilometers long. The line goes across villages of Ba Leng, Tan Lai, entering Mo Ang, crossing water fall of Nhot My and meets lake of Lan Ty.

- Route 5 starting from the commune center to Tan Lai, being 3 kilometers long to the surrounding areas of the commune within radius of 0,5 kilometer.

In addition, we also established a number of additional routes, which were the route from the commune center to Lan Giang and Ba Mo and the route from Tan Lai to Lan Dai and Nong Dung mountain creek on purposes of collecting additional data on bird composition.

- Study timing: During the 2009 - 2010 period, 6 field study trips were organized with total of 45 days of field study.

### 2.2. Study methodology

The key method used in field study was to observe birds in nature with assistance of binoculars Nikon Action EX 8x40CF, Fieldscopes connected with Nikon connector, Nikon D70S camera with Nikon zoom tele 70-300mm VR and AFS teleconverter TC-20 EII connector.

The mist-nets four hands kindly were put to use, being 12 meters long and 2,6 meters high, and meshes of 15 x 15mm made in Italia (provided by the National Museum of Natural History in Paris, France - MNHN), for catching birds to identify precisely the kinds of birds of small size living in bushes and difficult to detect.

For rapidly detecting birds in the field study, we made references to a number of publications on instructions and guidance on identifying birds in Southeast Asia and Vietnam, which were illustrated with colour photos and detailed instructions [1,2].

Birds were listed in the classification systems proposed by Sibley-Ahlquist-Monroe (SAM)[3,4] and which was used in World lists of birds (Dickinson ed., 2003)[5]. As for classification, further discussions are needed in

each case. The English names were taken from materials by Robson, 2000[2].

### 3. Results and discussions

#### 3.1. Bird structure composition

On the basis of selective inheritance of study findings earlier conducted at Huu Lien Nature Reserve and the findings obtained during the two years' efforts, we have identified that the Area has 168 bird species belonging to 117 genus, 54 families, 17 orders (table 1). Among them, 58 species are illustrated with photos taken in the nature, photos taken when they were in mist-nets, and remains collected in the community. The rest were based on direct observations made at field trips, on interviews and selected from inheritance from earlier findings.

Table 1. List of bird composition at Huu Lien Nature Reserve

Order	Scientific name	Common name
<b>I. GALLIFORMES</b>		
<b>1. Phasianidae</b>		
1	<i>Francolinus pintadeanus</i> (Scopoli, 1786)	Chinese francolin
2	<i>Gallus gallus</i> (Linnaeus, 1758)	Red junglefowl
3	<i>Lophura nycthemera</i> (Linnaeus, 1758)	Silver pheasant
4	<i>Polyplectron bicalcaratum</i> Linnaeus, 1758	Grey peacock-pheasant
<b>II. ANSERIFORMES</b>		
<b>2. Anatidae</b>		
5	<i>Anas poecilorhyncha</i> Swinhoe, 1866	Chinese spotbill
6	<i>Anas querquedula</i> Linnaeus, 1758	Garganey
<b>III. PODICIPEDIFORMES</b>		
<b>3. Podicipedidae</b>		
7	<i>Tachybaptus ruficollis</i> (Pallas, 1764)	Little grebe
<b>IV. CICONIIFORMES</b>		
<b>4. Ardeidae</b>		
8	<i>Ixobrychus cinnamomeus</i> (Gmelin, 1789)	Cinnamon bittern

9	<i>Butorides striatus</i> (Linnaeus, 1758)	Striated heron
10	<i>Ardeola bacchus</i> (Bonaparte, 1855)	Chinese pond heron
11	<i>Bubulcus ibis</i> (Linnaeus, 1758)	Cattle egret
12	<i>Egretta garzetta</i> Linnaeus, 1766	Little egret
<b>V. FALCONIFORMES</b>		
<b>5. Falconidae</b>		
13	<i>Falco tinnunculus</i> Linnaeus, 1758	Common kestrel
14	<i>Falco peregrinus</i> Tunstall, 1771	Peregrine falcon
<b>6. Accipitridae</b>		
15	<i>Aviceda leuphotes</i> (Dumont, 1820)	Black baza
16	<i>Milvus migrans</i> (Boddaert, 1783)	Black kite
17	<i>Spilornis cheela</i> Latham, 1790	Crested serpent eagle
18	<i>Accipiter trivirgatus</i> (Temminck, 1824)	Crested goshawk
19	<i>Accipiter gentilis</i> (Linnaeus, 1758)	Northern goshawk
20	<i>Accipiter badius</i> Gmelin, 1788	Shika
<b>VI. GRUIFORMES</b>		
<b>7. Rallidae</b>		
21	<i>Gallinula chloropus</i> (Linnaeus, 1758)	Common moorhen
22	<i>Gallirallus striatus</i> (Linnaeus, 1766)	Slaty-breasted rail
23	<i>Porzana fusca</i> Linnaeus, 1766	Ruddy-breasted crake
24	<i>Amaurornis phoenicurus</i> Pennant, 1769	White-breasted waterhen
<b>8. Turnicidae</b>		
25	<i>Turnix suscitator</i> (Gmelin, 1789)	Barred buttonquail
<b>VII. CHARADRIIFORMES</b>		
<b>9. Charadriidae</b>		
26	<i>Vanellus duvaucelii</i> (Lesson, 1826)	River lapwing
27	<i>Charadrius dubius</i> Scopoli, 1786	Little ring plover
<b>VIII. COLUMBIFORMES</b>		
<b>10. Columbidae</b>		
28	<i>Streptopelia orientalis</i> (Latham, 1790)	Oriental turtle-dove
29	<i>Streptopelia chinensis</i> (Scopoli, 1768)	Spotted dove
30	<i>Treron curvirostra</i> (Gmelin, 1789)	Thick-billed green-pigeon
31	<i>Ducula aenea</i> (Linnaeus, 1766)	Green imperial-pigeon
<b>IX. PSITTACIFORMES</b>		
<b>11. Psittacidae</b>		
32	<i>Psittacula himalayana</i> (Lesson, 1831)	Slaty-headed parakeet
33	<i>Psittacula alexandri</i> (Linnaeus, 1758)	Red-breasted parakeet
<b>X. CUCULIFORMES</b>		

**12. Cuculidae**

34	<i>Cuculus sparveroides</i> Vigors, 1832	Large hawk-cuckoo
35	<i>Cuculus micropterus</i> Gould, 1837	Indian cuckoo
36	<i>Cacomantis merulinus</i> (Scopoli, 1786)	Plaintive cuckoo
37	<i>Eudynamys scolopacea</i> (Linnaeus, 1758)	Asian koel
38	<i>Phaenicophaeus tristis</i> (Lesson, 1830)	Green-billed malkoha
39	<i>Centropus bengalensis</i> (Gmelin, 1788)	Lesser coucal
40	<i>Centropus sinensis</i> (Stephens, 1815)	Crown pheasant

**XI. STRIGIFORMES****13. Strigidae**

41	<i>Otus lettia</i> Hodgson, 1836	Collared scops owl
42	<i>Otus sunia</i> Hodgson, 1836	Oriental scops owl
43	<i>Bubo zeylonensis</i> (Gmelin, 1788)	Brown fish-owl
44	<i>Glaucidium cuculoides</i> (Vigors, 1831)	Asian barred owlet
45	<i>Ninox scutulata</i> Raffles, 1822	Brown hawk owl

**XII. CAPRIMULGIFORMES****14. Caprimulgidae**

46	<i>Caprimulgus macrurus</i> Horsfield, 1821	Large-tailed nightjar
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**XIII. APODIFORMES****15. Hemiprocnidae**

47	<i>Apus pacificus</i> (Latham, 1802)	Fork-tailed swift
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**XIV. TROGONIFORMES****16. Trogonidae**

48	<i>Harpactes erythrocephalus</i> (Gould, 1834)	Red-headed trogon
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**XV. CORACIIFORMES****17. Coraciidae**

49	<i>Eurystomus orientalis</i> Linnaeus, 1766	Oriental dollarbird
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**18. Alcedinidae**

50	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	White-throated kingfisher
51	<i>Halcyon pileata</i> (Boddeart, 1783)	Black-capped kingfisher
52	<i>Alcedo atthis</i> (Linnaeus, 1758)	Common kingfisher

**19. Meropidae**

53	<i>Nyctornis athertoni</i> (Jardine & Selby, 1830)	Blue-bearded bee-eater
54	<i>Merops philippinus</i> Linnaeus, 1766	Blue-tailed bee-eater

**20. Upupidae**

55	<i>Upupa epops</i> Linnaeus, 1758	Hoopoe
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**21. Bucerotidae**

56	<i>Anthracoceros albirostris</i> (Shaw & Nodder, 1807)	Oriental pied hornbill
57	<i>Buceros bicornis</i> Linnaeus, 1758	Great hornbill

## XVI. PICIFORMES

### 22. Ramphastidae

58	<i>Megalaima virens</i> (Boddaert, 1783)	Great barbet
59	<i>Megalaima lagrandieri</i> Verreaux, 1868	Red-vented barbet
60	<i>Megalaima faiostricta</i> (Temminck, 1831)	Green-eared barbet
61	<i>Megalaima franklinii</i> (Blyth, 1842)	Golden-throated barbet
62	<i>Megalaima asiatica</i> (Latham, 1790)	Blue-throated barbet

### 23. Picidae

63	<i>Sasia ochracea</i> Hodgson, 1836	White-browed piculet
64	<i>Dendrocopos canicapillus</i> (Blyth, 1845)	Grey-capped woodpecker
65	<i>Celeus brachyurus</i> (Vieillot, 1818)	Rufous woodpecker
66	<i>Picus chlorolophus</i> Vieillot, 1818	Lesser yellownaped
67	<i>Picus flavinucha</i> Gould, 1834	Greater yellownape

## XVII. PASSERIFORMES

### 24. Eurylaimidae

68	<i>Psarisomus dalhousiae</i> Jameson, 1835	Long-tailed broadbill
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### 25. Artamidae

69	<i>Artamus fuscus</i> (Vieillot, 1817)	Ashy woodswallow
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### 26. Aegithinidae

70	<i>Aegithina tiphia</i> (Linnaeus, 1758)	Common iora
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### 27. Campephagidae

71	<i>Coracina novaehollandiae</i> Gmelin, 1789	Black-faced cuckoo-shrike
72	<i>Pericrocotus roseus</i> (Vieillot, 1818)	Rosy minivet
73	<i>Pericrocotus flammeus</i> Forster, 1781	Scalet minivet

### 28. Laniidae

74	<i>Lanius cristatus</i> Linnaeus, 1758	Brown shrike
75	<i>Lanius schach</i> Linnaeus, 1758	Long-tailed shrike

### 29. Oriolidae

76	<i>Oriolus chinensis</i> Linnaeus, 1766	Black-napped oriole
77	<i>Oriolus traillii</i> (Swinhoe, 1870)	Maroon oriole

### 30. Dicruridae

78	<i>Dicrurus macrocercus</i> (Vieillot, 1817)	Black drongo
79	<i>Dicrurus leucophaeus</i> Vieillot, 1817	Ashy drongo
80	<i>Dicrurus annectans</i> (Hodgson, 1836)	Crow-billed drongo
81	<i>Dicrurus remifer</i> (Temminck, 1823)	Lesser racket-tailed drongo
82	<i>Dicrurus paradiseus</i> Linnaeus, 1766	Greater racket-tailed drongo

<b>31. Rhipiduridae</b>		
83	<i>Rhipidura albicollis</i> (Vieillot, 1818)	White-throated fantail
<b>32. Monarchidae</b>		
84	<i>Hypothymis azurea</i> (Boddaert, 1783)	Black-napped monarch
85	<i>Terpsiphone paradise</i> (Linnaeus, 1758)	Asian paradise-flycatcher
<b>33. Corvidae</b>		
86	<i>Urocissa whiteheadi</i> Ogilvie-Grant, 1899	White-winged magpie
87	<i>Crypsirina temia</i> (Daudin, 1800)	Racquet-tailed treepie
88	<i>Corvus macrorhynchos</i> Wagler, 1827	Jungle crow
<b>34. Paridae</b>		
89	<i>Parus major</i> Linnaeus, 1758	Great tit
90	<i>Melanochlora sultanea</i> (Hodgson, 1837)	Sultan tit
<b>35. Hirundinidae</b>		
91	<i>Hirundo rustica</i> Linnaeus, 1758	Barn swallow
92	<i>Cecropis daurica</i> (Linnaeus, 1771)	Red-rumped swallow
<b>36. Alaudidae</b>		
93	<i>Alauda gulgula</i> Franklin, 1831	Oriental skylark
<b>37. Pycnonotidae</b>		
94	<i>Pycnonotus atriceps</i> (Temminck, 1822)	Black-headed bulbul
95	<i>Pycnonotus melanicterus</i> (Gmelin, 1789)	Black-crested bulbul
96	<i>Pycnonotus jocosus</i> (Linnaeus, 1758)	Red-whiskered bulbul
97	<i>Pycnonotus xanthorrhous</i> Anderson, 1869	Brown-breasted bulbul
98	<i>Pycnonotus sinensis</i> (Gmelin, 1789)	Light-vented bulbul
99	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Red-vented bulbul
100	<i>Pycnonotus aurigaster</i> (Vieillot, 1818)	Sooty-headed bulbul
101	<i>Criniger pallidus</i> (Swinhoe, 1870)	Puff-throated bulbul
102	<i>Iole propinqua</i> (Oustalet, 1903)	Grey-eyed bulbul
103	<i>Hypsipetes madagascariensis</i> (P.L.S. Muller, 1776)	Madagascan bulbul
<b>38. Cisticolidae</b>		
104	<i>Prinia rufescens</i> Blyth, 1847	Rufescent prinia
105	<i>Prinia inornata</i> Sykes, 1832	Plain prinia
106	<i>Orthotomus atrogularis</i> Temminck, 1836	Dark-necked tailorbird
107	<i>Orthotomus sutorius</i> (Pennant, 1769)	Common tailorbird
<b>39. Phylloscopidae</b>		
108	<i>Phylloscopus borealis</i> (H. Blasius, 1858)	Arctic warbler
109	<i>Phylloscopus inornatus</i> (Blyth, 1842)	Yellow-browed warbler
<b>40. Cettiidae</b>		
110	<i>Abroscopus albogularis</i> (Hodgson, 1854)	Rufous-faced warbler

**41. Timallidae**

111	<i>Pellorneum ruficeps</i> Swainson, 1832	Puff-throated babbler
112	<i>Pellorneum tickelli</i> (Blyth, 1859)	Buff-breasted babbler
113	<i>Pomatorhinus erythrogenys</i> Vigors, 1832	Rusty-cheeked scimitar babbler
114	<i>Pomatorhinus ferruginosus</i> Blyth, 1845	Coral-billed scimitar babbler
115	<i>Napothera crispifrons</i> (Blyth, 1855)	Limestone wren-babbler
116	<i>Napothera brevicaudata</i> (Blyth, 1855)	Streaked wren-babbler
117	<i>Napothera epilepidota</i> (Temminck, 1827)	Eyebrowed wren-babbler
118	<i>Stachyris ambigua</i> (Harington, 1915)	Buff-chested babbler
119	<i>Stachyris ruficeps</i> Blyth, 1847	Rufous-capped babbler
120	<i>Stachyris nigriceps</i> Blyth, 1844	Grey-throated babbler
121	<i>Stachyris chrysaea</i> Blyth, 1844	Golden babbler
122	<i>Macronous gularis</i> (Horsfield, 1822)	Striped tit-babbler
123	<i>Timalia pileata</i> Horsfield, 1821	Chestnut-capped babbler
124	<i>Garrulax perspicillatus</i> J.F. Gmelin, 1789	Masked laughingthrush
125	<i>Garrulax leucolophus</i> (Hardwicke, 1815)	White-crested laughing thrush
126	<i>Garrulax chinensis</i> (Scopoli, 1786)	Black-throated laughingthrush
127	<i>Garrulax canorus</i> (Linnaeus, 1758)	Chinese hwamei
128	<i>Garrulax sannio</i> Swinhoe, 1867	White-browed laughingthrush
129	<i>Leiothrix argentauris</i> (Hodgson, 1837)	Silver-eared mesia
130	<i>Alcippe morrisonia</i> Swinhoe, 1863	Grey-checked fulvetta
131	<i>Erpornis zantholeuca</i> (Blyth, 1844)	White-bellied yuhina

**42. Zosteropidae**

132	<i>Zosterops japonicus</i> (Temminck and Schlegel, 1847)	Japanese white-eye
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**43. Irenidae**

133	<i>Irena puella</i> (Latham, 1790)	Asian fairy-bluebird
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**44. Sittidae**

134	<i>Sitta frontalis</i> Swainson, 1820	Velvet-fronted nuthatch
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**45. Sturnidae**

135	<i>Acridotheres cristatellus</i> (Linnaeus, 1766)	Crested myna
136	<i>Gracula religiosa</i> Linnaeus, 1758	Hill myna
137	<i>Acridotheres tristis</i> (Linnaeus, 1766)	Common myna
138	<i>Sturnus sinensis</i> (J.F. Gmelin, 1788)	White shouldered starling

**46. Turdidae**

139	<i>Myophoneus caeruleus</i> (Scopoli, 1786)	Blue whistling-thrush
140	<i>Zoothera dauma</i> (Latham, 1790)	White's thrush



141	<i>Turdus dissimilis</i> Blyth, 1847	Black-breasted thrush
142	<i>Turdus cardis</i> Temminck, 1831	Japanese thrush
<b>47. Muscicapidae</b>		
143	<i>Erithacus calliope</i> (Pallas, 1776)	Siberian rubythroat
144	<i>Copsychus saularis</i> (Linnaeus, 1758)	Oriental magpie robin
145	<i>Copsychus malabaricus</i> (Scopely, 1788)	White-rumped shama
146	<i>Rhyacornis fuliginosus</i>	Plumbeous water redstart
147	<i>Enicurus leschenaultia</i> (Vieillot, 1818)	White-crowned forktail
148	<i>Saxicola torquaus</i> (Linnaeus, 1766)	Comon stonechat
149	<i>Saxicola ferreus</i> Gray, 1846	Grey bushchat
150	<i>Monticola solitarius</i> (Linnaeus, 1758)	Blue rock thrush
151	<i>Muscicapa dauurica</i> Pallas, 1811	Asian brown flycatcher
152	<i>Eumyias thalassina</i> Swainson, 1838	Verditer flycatcher
153	<i>Cyornis hainanus</i> (Ogilvie-Grant, 1900)	Hainan blue flycatcher
154	<i>Culicicapa ceylonensis</i> (Swainson, 1820)	Grey-headed canary-flycatcher
<b>48. Dicaeidae</b>		
155	<i>Dicaeum concolor</i> Jerdon, 1840	Plain flowerpecker
<b>49. Nectariniidae</b>		
156	<i>Cinnyris jugularis</i> Linnaeus, 1766	Olive-backed sunbird
157	<i>Aethopyga christinae</i> Swinhoe, 1869	Fork-tailed sunbird
158	<i>Aethopiga siparaja</i> (Raffles, 1822)	Crimson sunbird
<b>50. Promeropidae</b>		
159	<i>Arachnothera longirostra</i> (Latham, 1790)	Little spiderhunter
160	<i>Arachnothera magna</i> (Hodgson, 1837)	Streaked spiderhunter
<b>51. Ploceidae</b>		
161	<i>Passer montanus</i> (Linnaeus, 1758)	Tree sparrow
<b>52. Estrildidae</b>		
162	<i>Lonchura striata</i> (Linnaeus, 1766)	White-rumped munia
163	<i>Lonchura punctulata</i> (Linnaeus, 1758)	Scaly-breasted munia
<b>53. Motacillidae</b>		
164	<i>Motacilla cinerea</i> Tunstall, 1771	Grey wagtail
165	<i>Motacilla alba</i> Linnaeus, 1758	White wagtail
166	<i>Anthus richardi</i> Vieillot, 1818	Richard's pipit
167	<i>Anthus hodgsoni</i> Richmond, 1907	Olive-backed pipit
<b>54. Emberizidae</b>		
168	<i>Emberiza pusilla</i> Pallas, 1776	Little bunting

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The above list of birds in Huu Lien Nature Reserve was arranged with SAM system used in describing the Complete Checklist of the Birds of the World (Dickinson, 2003)[5]. However, there are a few adjustments made to suit the recently announced findings on bird classification (Nguyen Lan Hung Son, Nguyen Thanh Van, 2010)[6]. Species of Buttonquails in this list were still arranged in the order of Gruiformes as earlier for the reason that there are still some opinions and data that do not allow to separate this as a new order (Turniciformes). Similarly, the species of Hoopoe, Oriental pied hornbill, Great hornbill could not be separated as a new order (Bucerotiformes) as in views of Hackett et al., 2008[7], but rather be arranged in the order of Coraciiformes as previously. Besides, a number of genus in the family of Old world warbler (Sylviidae) were previously separated as a new family of Cettiidae, having common names of Cettiid warblers. This family includes singing birds and worm-eating species that are of small size and includes 9 breeds: *Abroscopus*, *Pholidornis*, *Hylia*, *Erythrocerus*, *Urosphena*, *Tesia*, *Cettia*, *Tickellia*, *Phyllergates*. In the later studies, it was believed that a number of other genus could also be arranged in this family, for instance, *Eremomela*[8].

In consideration of the diversity of species in orders, it was shown that the Passeriformes has the most structural population (101 species). The order of Piciformes is the second with 10 species, followed by the orders of Coraciiformes with 9 species, the Falconiformes with 8 species, and the Cuculiformes with 7 species. There are 4 orders that have only 1 family, 1 genus, 1 species, such as the order of Podicipediformes, Caprimulgiformes, Apodiformes and Trogoniformes.

In terms of the diversity of bird composition in families, the family of Timaliidae have the most species, with 21 species, followed by the families of Muscicapidae (12 species), Pycnonotidae (10 species), Cuculidae (7 species) and Accipitridae (6 sets). In contrast, a number of families have low diversity, with only one species, such as the families of Zosteropidae, Irenidae, Sittidae, and the set of Alaudidae...

Geobiologically, Huu Lien Nature Reserve is situated in the South China tropical area belonging to the North Vietnamese subtropical forests. The regional fauna of this conservation area is characterized as unique and typical, especially it is the area where a large population of endemic monkeys live under global threat. In birds particularly, this is where many important birds within the Vietnamese Northeast regional fauna are concentrated. The typical ecological environment is that lime stone mountains are covered with green forests and are interlaced with large valleys. For this reason, although being under massive influences of humans, the endemic bird families are considerably diversified, for instance, the family of Timaliidae, Muscicapidae, Pycnonotidae, and Cuculidae. However, typical families of subtropical birds, such as Phasianidae, Zosteropidae, Picidae, and Sturnidae are found to be less diversified. One example can be cited here to illustrate the impacts made by human beings on bird existence and distribution. The White-vented myna (*Acridotheres fuscus*) used to be rather familiar with the inhabitants of the conservation area, as they were looking for food together with cattles. However, through interviews and practical field trips, we were unable to notice the appearance of this species in the study sites.

### 3.2. Rare birds with high genetic preservation values

Of the total 168 bird species recorded in Huu Lien Nature Reserve, we have listed 9 rare species, with high genetic preservation values (see table 2).

Table 2. Rare bird species with high genetic preservation values in Huu Lien Nature Reserve

Order	Species	RDBVN, 2007	ND32/2006	IUCN, 2009	CITES, 2009
1	Silver pheasant <i>Lophura nychthemera</i>	LR cd	IB		
2	Grey peacock-pheasant <i>Polyplectron bicalcaratum</i>	VU A1 a, c C2a	IB		
3	Slaty-headed parakeet <i>Psittacula himalayana</i>		IIB		
4	Red-breasted parakeet <i>Psittacula alexandri</i>		IIB		
5	Brown fish-owl <i>Bubo zeylonensis</i>		IIB		
6	Great hornbill <i>Buceros bicornis</i>	VU A1, c,d C1	IIB	NT	I
7	Chinese hwamei <i>Garrulax canorus</i>				II
8	Hill myna <i>Gracula religiosa</i>		IIB		II
9	White-rumped shama <i>Copsychus malabaricus</i>		IIB		

Notes:

RDBVN, 2007: Red Data Book of Vietnam, 2007

ND32/2006: Decree 32/2006/NĐ-CP of the Vietnam Government

IUCN, 2009: IUCN Red List of Threatened Species, 2009

CITES, 2009: Convention on International Trade in Endangered Species of Wild Fauna and Flora, 2009

It is shown in table 2 that 3 bird species are present in Red Data Book of Vietnam, 2007, of which 2 species are at **VU** level, 1 species is at **LR** level. 8 species are named in the ordinance numbered ND32/2006, 2 species at **IB** level, 6 species at **IIB** level. 3 species appear in the list of **CITES**, 2009. In particular, 1 species is named in the Red List of **IUCN**, 2009, that is the species of Great hornbill *Buceros bicornis*, at level of **NT** - species threatened to be near extinction.

Most of these species were seldom seen in the study sites, except for White-rumped shama and Silver pheasant which were occasionally met and whose feathers were collected during the study.

For this reason, during their planning for conservation, the management board of Huu Lien Nature Reserve should focus on the

prioritization of preservation of the above-mentioned rare bird species, should primarily prohibit hunting them and should protect and recover their ecological environment.

#### 4. Conclusion

It has been identified that Huu Lien Nature Reserve possesses 168 bird species belonging to 117 genus, 54 families, and 17 orders.

The order of Passeriformes is the most diversified in composition with 101 species, followed by the orders of Coraciiformes, Falconiformes, and Cuculiformes. The most diversified family is the Timaliidae (21 species), followed by the family of Muscicapidae, and Pycnonotidae.

The bird composition is representative to the ecological system of lime stone mountains in Northeast region of Vietnam.

There are 9 rare bird species of high value of genetic preservation, in which, 1 species is named in the Red list of IUCN, 2009 and 3 species appear in Red Book of Vietnam, 2007.

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