

**SPECIES DIVERSITY OF BIRD TRADING IN LOCAL
MARKETS OF BOLIKHAMXAY AND
KHAMMOUANE PROVINCES,
LAO PDR**



Santi Xayyasith

**A Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy in Environmental Biology**

Suranaree University of Technology

Academic Year 2018

ความหลากหลายของนกที่ขายในตลาดท้องถิ่นของจังหวัดบอริคำไซและ
คำม่วน ประเทศลาว



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรดุษฎีบัณฑิต
สาขาวิชาชีววิทยาลิ่งแวดล้อม
มหาวิทยาลัยเทคโนโลยีสุรนารี
ปีการศึกษา 2561

**SPECIES DIVERSITY OF BIRD TRADING IN LOCAL
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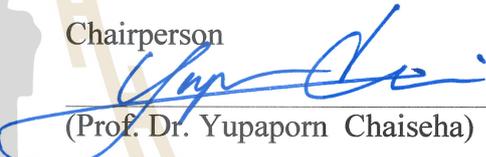
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คำม่วน ประเทศลาว (SPECIES DIVERSITY OF BIRD TRADING IN LOCAL
MARKETS OF BOLIKHAMXAY AND KHAMMOUANE PROVINCES, LAO PDR)
อาจารย์ที่ปรึกษา : ศาสตราจารย์ ดร.ยุพาพร ไชยสีหา, 267 หน้า.

สาธารณรัฐประชาธิปไตยประชาชนลาว (สปป. ลาว) เป็นประเทศที่มีความหลากหลายทาง
ชีวภาพ โดยเฉพาะชนิดพันธุ์ที่หายากและเฉพาะถิ่น ปัจจุบันมีบันทึกว่าพบมากกว่า 700 ชนิด
พันธุ์ในประเทศลาว ภัยคุกคามหลักของนกในประเทศลาวคือการลักลอบตัดไม้ การถางป่า การแตก
กระจายของผืนป่า และการล่าสัตว์ เหตุผลหลักของการล่านกคือนำไปเป็นอาหารและเพื่อการค้าที่
ผิดกฎหมายซึ่งเกิดขึ้นในหลายพื้นที่ของประเทศ การศึกษาครั้งนี้มีจุดประสงค์เพื่อประเมินความ
หลากหลายของชนิดพันธุ์นก การสำรวจจำนวนและราคาของการค้าขายนกแต่ละชนิดพันธุ์ในตลาด
ท้องถิ่น นอกจากนี้การศึกษานี้ยังมีจุดประสงค์เพื่อจัดทำข้อมูลและแผนที่การกระจายชนิด
พันธุ์ของนกที่พบในตลาดท้องถิ่นตลอดจนอธิบายภาวะเศรษฐกิจและสังคม การรับรู้ ทัศนคติและ
พฤติกรรมต่อการค้าของผู้นำในภาคกลางของประเทศลาว ทำการสำรวจภาคสนามทั้งหมด 6
ครั้ง ระหว่างปี 2015 และ 2016 ในตลาดท้องถิ่น 8 แห่งของสองจังหวัดในภาคกลางของประเทศ
การกระจายของชนิดพันธุ์นกที่พบในภาคกลางของประเทศได้ถูกทบทวนจากเอกสารที่มีการ
รายงานไว้ก่อนหน้านี้ ผู้นำรวมทั้ง 29 ราย จากตลาด 2 แห่งที่มีการค้าขายนกหลากหลายชนิดพันธุ์
ได้ถูกสัมภาษณ์เพื่อศึกษารายละเอียดภาวะเศรษฐกิจและสังคม การรับรู้ ทัศนคติ และพฤติกรรม
เพื่อประเมินความชุกชุมของชนิดพันธุ์นกที่พบในตลาดท้องถิ่น ข้อมูลที่ได้จากการสำรวจได้ถูก
นำมาสร้างกราฟลดทอนโดยใช้โปรแกรม EstimateS จำนวนและราคาของนกแต่ละชนิดพันธุ์ได้ถูก
นำมาหาค่าต่ำสุด ค่าสูงสุด ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐานโดยใช้ซอฟต์แวร์ SPSS เวอร์ชัน
17.0 สำหรับวินโดวส์ One-way ANOVA ได้ถูกนำมาใช้เพื่อวิเคราะห์หาความแตกต่างของราคา
นกแต่ละชนิดในแต่ละตลาดท้องถิ่น นกชนิดพันธุ์ใดมีขนาดตัวอย่างน้อยกว่า 3 ตัวในแต่ละตลาด
จะไม่ถูกนำมาวิเคราะห์ แผนที่ความชุกชุมของนกที่พบในภาคกลางของประเทศลาวที่ประกอบไป
ด้วยชนิดพันธุ์นกที่พบจากตลาดท้องถิ่น และแผนที่กระจายของนกถูกสร้างขึ้นโดยใช้ซอฟต์แวร์
ArcGIS เวอร์ชัน 10.1 วินโดวส์ ผลการศึกษาพบนกจำนวน 1,020 ตัวในช่วง 48 วันของการ
สำรวจ นอกจากนี้มีนกจำนวน 718 ตัวได้ถูกจัดจำแนกอยู่ใน 13 อันดับ 30 วงศ์ 85 ชนิดพันธุ์ และ
นกจำนวน 302 ตัวไม่สามารถระบุชนิดพันธุ์ได้ ชนิดพันธุ์ที่มีราคาแพงที่สุดคือ นกขุนทองโดยมี

ราคา 61.30 เหรียญสหรัฐต่อตัว และชนิดพันธุ์ที่มีราคาถูกที่สุดคือ นกปรอดทอง โดยมีราคา 0.25 เหรียญสหรัฐต่อตัว อย่างไรก็ตามจากการรายงานของป่าสงวนแห่งชาติ ทั้ง 5 แห่งในภาคกลางของลาวพบนกทั้งหมด 478 ชนิดพันธุ์ใน 19 อันดับ และ 77 วงศ์ จากการทบทวนการกระจายของ 85 ชนิดพันธุ์พบ 3 ชนิดพันธุ์ไม่เคยมีการบันทึกจากพื้นที่ไว้ก่อนหน้า นอกจากนี้จากการสัมภาษณ์แสดงให้เห็นว่าผู้ค้าคนมีรายได้เฉลี่ย 14.81 เหรียญสหรัฐต่อวัน (3.6-60 เหรียญสหรัฐต่อวัน) ผลการศึกษาครั้งนี้สามารถใช้เป็นข้อมูลพื้นฐานในการควบคุมการค้าสัตว์ และการค้าสัตว์ป่า โดยเฉพาะนกเพื่อการอนุรักษ์ และเพื่อจัดการสัตว์ป่าในประเทศลาว



สาขาวิชาชีววิทยา

ปีการศึกษา 2561

ลายมือชื่อนักศึกษา

ลายมือชื่ออาจารย์ที่ปรึกษา

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SANTI XAYYASITH : SPECIES DIVERSITY OF BIRD TRADING IN
LOCAL MARKETS OF BOLIKHAMXAY AND KHAMMOUANE
PROVINCES, LAO PDR. THESIS ADVISOR : PROF. YUPAPORN
CHAISEHA, Ph.D. 267 PP.

BIRD TRADE/BIODIVERSITY/LAO PDR/LOCAL MARKET/MAP
DISTRIBUTION/SOCIO-ECONOMIC

Lao People's Democratic Republic (Lao PDR) is a hotspot for species diversity, especially rare and endemic species. To date, more than 700 species of birds have been recorded from Lao PDR. The main threats to the birds in Lao PDR are illegal logging, forest clearance, forest fragmentation and hunting. The main reason of bird hunting is for food supply and illegal trade which can be seen in several parts of the country. This study aimed to assess species diversity and to investigate the number and value of each bird species traded in local markets. In addition, it also aimed to document and map the distribution of bird species found in the local markets, as well as describe the socio-economic profile of Lao traders, their perception, attitude and actions to bird trade in central Lao PDR. Field observation was conducted six times between 2015 and 2016 in eight local markets of two provinces in central Lao PDR. The distribution of birds species found in central part of the country was reviewed based on literature. Twenty-nine traders of two markets who sold high diversity of bird species were interviewed for their socio-economic profile, perception, attitude and action. To assess species richness of birds found in local markets, sample-based rarefaction curve was generated using EstimateS. Numbers and values for each

species were evaluated for minimum, maximum, mean and standard deviation using software SPSS version 17.0 for Windows (SPSS Inc., Chicago, IL, USA). One-way ANOVA was run to test the differentiation of the value of each species in each local market. Any species with sample size of less than 3 in each market were excluded from analysis. The species richness map of birds found in central Lao PDR including bird species observed from local markets and distribution maps of bird species were generated using the software ArcGIS version 10.1 for window (ESRI Inc.). The results showed that total 1,020 birds were found during 48 observation days. In addition, 718 birds were identified to 13 orders, 30 families, 85 species and 302 birds were unidentified. The most expensive species was common hill myna (*Gracula religiosa*) at a price of US\$ 61.30 per individual and the cheapest species was black-headed bulbul (*Pycnonotus atriceps*) at a price of US\$ 0.25 per individual. However, a total of 478 species of birds, belonging to 19 orders and 77 families have been reported from the five National Biodiversity Conservation Areas, central Lao PDR. The review of the distribution of 85 species showed that 3 species were not previously recorded from the area. In addition, the results from the interview showed that the traders earned averagely US\$ 14.81/day (3.6-60 US\$/day) from bird trade. The results of this study can be used as the baseline information for controlling the hunting and trading of wildlife, especially birds species in order to conserve as well as to manage the wildlife in Lao PDR.

School of Biology

Academic Year 2018

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ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my thesis advisor Prof. Dr. Yupaporn Chaiseha for her support guidance throughout the study and constant throughout the course of research. I would not have been able to complete a Ph.D. without her advice. I am also deeply grateful to my thesis co-advisor, Dr. Bounsavane Douangboubpha for his precious advice, and also for his kind support throughout research.

I wish to thank Mr. Boonyarit Kamkrathok and Ms. Panpradap Sinpru for their helping me to get through the difficult times and for all the emotional support and friendship.

I also appreciated Mr. Daosavanh Sanamxay and Mr. Vilakhan Xayaphet for their advice and contribution during my data collection.

I would also like to thank my family for their understanding, care, support and encouragement. Without them, I would not be what am I today.

Finally, this research would not have been possible without the funding support from SUT-Ph.D. Scholarship Program for ASEAN, Suranaree University of Technology, Thailand.

Santi Xayyasith

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LIST OF ABBREVIATIONS

ASL	= Above sea level
CITES	= Convention on International Trade in Endangered Species of Wild Fauna and Flora
CF	= Confer
CS	= Conservation Status
EstS	= Estimates
EN	= Endangered (IUCN Red List)
HNN	= Hin Namno
IUCN	= International Union for Conservation of Nature
IBA	= Important Bird and Biodiversity Area
LC	= Least Concern (IUCN Red List)
Lao PDR	= Lao People's Democratic Republic
M	= Metre
MM	= Millimetre
NT	= Near Threatened (IUCN Red List)
NNT	= Nakai-Nam Theun
NKD	= Nam Kading
NBCAs	= National Biodiversity Conservation Areas (known as National Protected Areas; NPAs)

LIST OF ABBREVIATIONS (Continued)

NBCAs	= National Biodiversity Conservation Areas (known as National Protected Areas; NPAs)
PHP	= Phou Hin Poun
PXH	= Phou Xang He
Red List	= IUCN Red List of Threatened Species
SPSS	= Statistical Package for Social Sciences
TS	= This Study
US\$	= United States Dollar
VU	= Vulnerable (IUCN Red List)
X	= Present
WCS	= Wildlife Conservation Society
WWF	= World Wildlife Fund for Nature

CHAPTER I

INTRODUCTION

1.1 Rational of the Study

Lao People's Democratic Republic (Lao PDR) is a hotspot for biodiversity, especially rare and endemic species (Myers et al., 2000; Tordoff et al., 2012). To date, more than 1,140 species of terrestrial vertebrates have been recorded from the country (Duckworth et al., 1999) including over 100 species of large mammals (Duckworth et al., 1999), 90 bat species (Thomas et al., 2013), 57 rodents, 13 insectivora (Francis, 2008), more than 700 species of birds (Duckworth et al., 1999), 198 species of reptiles (Luu et al., 2013) and more than 103 species of amphibians (Luu et al., 2014a). In the recent years, many new species of terrestrial vertebrates were discovered from the country including mammals (Jenkins and Robinson, 2002; Robinson et al., 2003; Jenkins et al., 2005; Musser et al., 2005; Guillen-Servent and Francis, 2006; Francis and Eger, 2012; Gorfol et al., 2014), birds (Duckworth et al., 2001; Woxvold et al., 2009; Alstrom et al., 2010), reptiles (David et al., 2004; 2012; Vogel et al., 2004; 2012; Nguyen et al., 2010; 2014; Tri and Pauwels, 2010; Luu et al., 2014b; 2014c; Nazarov et al., 2014; Schneider et al., 2014; Teynie et al., 2015; Tri et al., 2015) and amphibians (Stuart and Papenfuss, 2002; Bain and Truong, 2004; Ohler et al., 2004; Stuart and Heatwole, 2004; Bain and Stuart, 2005; Stuart and Bain, 2005; Stuart and Chan-Ard, 2005; Stuart et al., 2005; 2010; 2012; 2013; Bain et al., 2006; Rowley et al., 2010; Chan et al., 2013). Based on this high diversity, 319 species are importance

for national and global conservation including 67% of large mammals, 53% of bats, 2% of insectivora, 14% of murid rodents, 22% of birds, 25% of reptiles and 2% of amphibians (Duckworth et al., 1999).

Previously, the diversity of birds in Lao PDR was poorly known (Thewlis et al., 1998). However, many bird species have been discovered and recorded from Lao PDR in the recent years, namely Mekong wagtail (*Motacilla samveasnae*; Duckworth et al., 2001), red-necked stint (*Calidris ruficollis*), oriental pratincole (*Glareola maldivarum*), white winged tern (*Chlidonias leucopterus*), Malayan night heron (*Gorsachius melanolophus*), bluethroat (*Luscinia svecica*), chestnut-flanked white-eye (*Zosterops erythropleurus*), and bright-headed cisticola (*Cisticola exilis*; Evans, 2001), ashy wood pigeon (*Columba pulchricollis*), grey-tailed tattler (*Heteroscelus brevipes*), grey plover (*Pluvialis squatarola*), herring gull (*Larus argentatus*), purple cochoa (*Cochoa purpurea*), spotted bush warbler (*Bradypterus thoracicus*), and grey-winged blackbird (*Turdus boulboul*; Duckworth et al., 2002), black kite of race (*Milvus migrans govinda*; Duckworth and Tizard, 2003), Mandarin duck (*Aix galericulata*), grey-backed thrush (*Turdus hortulorum*), red-billed starling (*Sturnus sericeus*), white-cheeked starling (*Sturnus cineraceus*), rosy pipit (*Anthus roseatus*), Japanese grosbeak (*Eophona personata*; Duckworth, 2006), rufous-bellied woodpecker (*Dendrocopos hyperythrus*; Eve, 2007), white-browed crane (*Porzana cinerea*; Duckworth and Evans, 2007), ferruginous pochard (*Aythya nyroca*), baer's pochard (*Aythya baeri*), Eurasian thick-knee (*Burhinus oedicnemus*), narcissus flycatcher (*Ficedula narcissina*), light-vented bulbul (*Pycnonotus sinensis*), Japanese robin (*Erithacus akahige*), wood warbler (*Phylloscopus sibilatrix*), streaked weaver (*Ploceus manyar*), red avadavat (*Amandava amandava*; Duckworth, 2009), bare-faced

bulbul (*Pycnonotus hualon*; Woxvold et al., 2009), limestone leaf warbler (*Phylloscopu calciatilis*; Alstrom et al., 2010) and fairy pitta (*Pitta nympha*; Coudrat and Nanthavong, 2106).

Birds play many pivotal roles to the ecosystem such as pollination, seed dispersal and biological control (Whelan et al., 2008). Over 920 nectarivorous birds pollinated flower plants such as hummingbirds, sunbirds, false-sunbirds and flower-peckers (Stiles, 1981). Frugivorous or fruit-eating birds handle significant for seed dispersal (Heindl and Curio, 1999). There are 748 plants species in tropical forest that were dispersed seed by hornbills (Kitamura, 2011). In addition, insectivorous and carnivorous birds consume many agricultural pests including important insect pest and rats (Tscharntke et al., 2008).

Illegal and unregulated wildlife trade in Lao PDR is the huge threat and risk for wildlife worldwide (Singh, 2008). In Lao PDR, most bird species are threatened by loss of habitat, hunting for food and trade (Duckworth et al., 1999). Several of bird species are found as food-sources, sold for medicines, pets and variety of decorated objects in local markets in many parts of Lao PDR including threatened species (Srikosamatara et al., 1992; Srikosamatara and Suteethorn, 1994). Generally, species of birds are seen for trade in local markets in several parts of Lao PDR (Nash, 1993; 1997; Thewlis et al., 1998; Hallam et al., 2007; Singh et al., 2007; Singh, 2008). It has reported that Lak Sao local market in Bolikhamxay province is one of mainly significance of bird trading (Duckworth et al., 1999). It has been suggested that routine survey and observation of local markets in Lao PDR will provide an overview information of exploitation of animals occurring in the surrounding areas and occasionally provide interesting species records such as Laotian rock rat (*Laonastes*

aenigmamus) and Laotian giant flying squirrel (*Biswamoyopterus laoensis*), which were firstly discovered in local markets in central Lao PDR (Jenkins et al., 2005; Sanamxay et al., 2013). As aforementioned, there were limited data regarding bird trading in Lao PDR. Thus, the present study observed and documented bird trading in local markets in Lao PDR. This study provided the information regarding the diversity of birds and their related socio-economic profiles. In addition, the present study focused particularly on local markets in two provinces (Bolikhamsay and Khammouane) in central Lao PDR. These two provinces are important areas for rare and threatened species in Southeast Asia as well as the hotspot for birds in Lao PDR (Tobias et al., 1998; Ounekham and Inthapatha, 2003; Strange, 2013). High consumption (Hallam et al., 2007) and high hunting rate from local people (Coudrat et al., 2014) are found in these two provinces.

1.2 Research Objectives

- 1.2.1 To assess species diversity and investigate the number of each species of bird trading in local markets in Lao PDR.
- 1.2.2 To determine the threatened species of bird trading in local markets in Lao PDR.
- 1.2.3 To checklist of bird species recorded in the central Lao PDR and mapped distribution of 85 species recorded from local markets.
- 1.2.4 To assess the value of each bird species that trade in local markets in Lao PDR.
- 1.2.5 To describe the socio-economic profile of Lao traders, their perceptions, attitudes and actions to bird trade.

1.3 Research Hypotheses

The research hypotheses of this study was expected that species diversity and numbers of bird trading in Lao PDR were high and depend on each local market and each season. In addition, threatened species were recorded around the study areas and elsewhere in Lao PDR. The value of each species of traded bird depends on the species of birds and local markets. Birds are traded because of the socio-economic, perceptions, attitudes and actions of the local people.

1.4 Scope and Limitations of this Study

This study assessed species diversity as well as their numbers and value of bird trading in 8 local markets of two provinces (Bolikhamxay and Khammouane) in central Lao PDR. Data were collected six times per year (every other two months per time, eight days per time and two days for each market; except the fifth and sixth were collected during three months period). In addition, social-economic profile of traders, their perceptions, attitudes and actions to bird trade were interviewed from traders using random method. Two local markets where have high species diversity were selected to interview the traders. In each local market, 10-19 traders were interviewed.

1.5 Benefits of the Study

This study would provide important data on (1) species diversity of bird, (2) number of each bird species, (3) value of each species of bird, (4) number of threatened species of bird, (5) distribution maps of threatened species of bird, (6) type

of birds, (7) species of bird trading in each season. In addition, the socio-economic profile of Lao traders, their perceptions, attitudes and actions to bird trade in local markets of Khammouane Province, central Lao PDR were known, which could have been applied information for conservation and management planning in the future.

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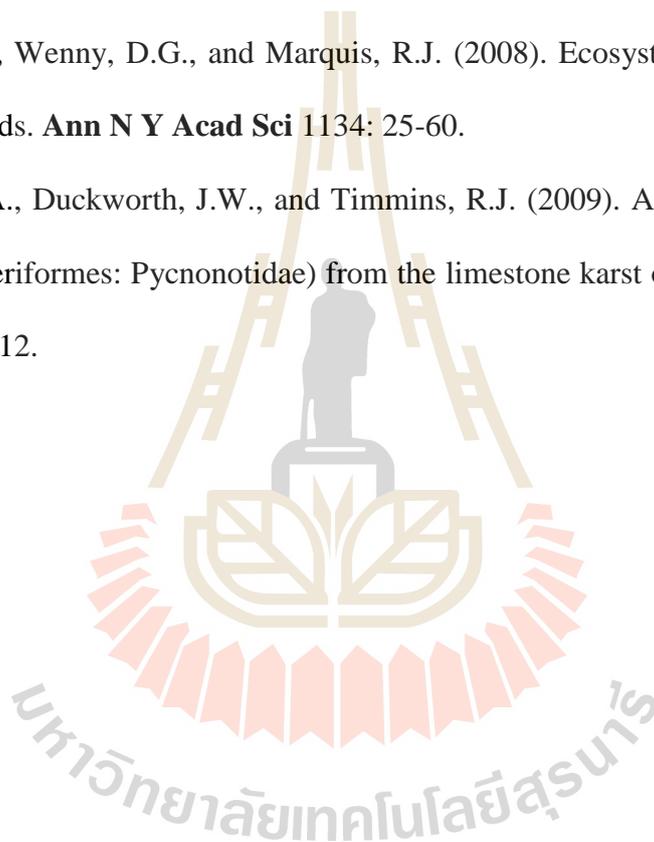
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CHAPTER II

LITERATURE REVIEW

2.1 Evolutoin of Birds

Origin of bird has been intimately known about 147 million years ago from the fossil discovered at limestone quarry in Bavaria, Germany, namely *Archaeopteryx* (Hickman et al., 2008). The fossil size is similar to a crow (Elphick et al., 2001; Hickman et al., 2008). From the fossil recorded, most zoologists suggest that birds and reptiles share the ancestor (Hickman et al., 2008). The evidences to support the view are occurring of single middle ear bones, 5 or 6 bones in lower jaw and similarity of egg laying. Moreover, birds also share many characters with theropod dinosaurs such as elongate and S-shaped neck. In addition, the fossils of ancient birds and dromeosaurs (a group of theropod) have been recorded from late Jurassic and early Cretaceous (Hickman et al., 2008).

2.2 Characteristics of Birds

Birds belong to the group of vertebrate which includes mammals, amphibians, reptiles and fish. Birds have two legs and are distinguished from others by occurring of feather. Their feather structures are filamentous, flexible, lightweight and soft in textures (Gill, 2007). Details of the character of birds are provided as the followings. Body is likely spindle-shaped and divided into four parts; head, neck, trunk and tail,

which has neck elongate and S-shaped. In addition, hind-limbs are adapted for perching, walking and swimming. Foot with four toes (2 or 3 toes in some species) and forelimbs are adapted to be wings. Moreover, bird respiration by lungs (parabronchi) which thin air sacs among the visceral organs and skeleton (Hickman et al., 2008).

2.3 Classification of Birds

The living birds were divided into two groups including Paleognathae and Neognathae (Hickman et al., 2008). Paleognathae is the large flightless birds such as ostriches and kiwis. Neognathae are flying birds such as geese and ducks. Previously, birds are classified into 30 orders in worldwide (Hickman, et al., 2008). To date, Hoyo et al. (2014) has reported 4,372 extended bird species which include 988 genera, 105 families and 35 orders. However, BirdLife International (2014) recently has reported 36 orders, 205 families and over 9,700 species of birds found in worldwide (Hickman et al., 2008). Birds have many colorful plumages (Thompson, 2013). There are four importance keys to identify bird species including; (1) size and shape, (2) habitat, (3) behavior and (4) color pattern (The Cornell Lab of Ornithology, 2011; Thompson, 2013).

2.4 Threats to Birds in Southeast Asia

Southeast Asia (Myanmar, Thailand, Malaysia, Singapore, Indonesia, Timor-Leste, Brunei Darussalam, Philippines, Cambodia, Vietnam and Lao PDR) is covered by four biodiversity hotspots including Sundaland, Wallacea, Philippines and Indo-Burma (Myers et al., 2000; Sodhi et al., 2004; 2010; Campbell et al., 2010). Which include nearly 500 mammals (Francis, 2008), more than 1,000 reptiles (Das, 2010),

more than 700 amphibians (Baker, 2015) and 1,327 birds species (Robson, 2008). However, Southeast Asia is one region of the highest deforestation rates such as agriculture, logging, habitat loss and urbanization (Sodhi et al., 2004; 2010; Duckworth et al., 2012). It is a central hotspot of wildlife trade (Sodhi et al., 2004), major threats to the biodiversity hotspot (Tordoff et al., 2012), the highest of vertebrate extinction risk (Duckworth et al., 2012) and local extinctions (Harris et al., 2015). Furthermore, one million birds are exported in this region during 1998-2007 which Malaysia, Indonesia and Vietnam are the most traded nations (Nijman, 2010). Moreover, several bird trade species are included in the Convention on International Trade in Endangered Species (CITES) Appendices and the International Union for Conservation of Nature (IUCN) Red Lists (Eid et al., 2011; Gilbert et al., 2012). The concern of the global conservation is an illegal bird trade for pets and food (Duckworth et al., 1999, Thewlis et al., 1998, Daut et al., 2014). Incidentally, 12,751 individuals of Asian golden weaver (*Ploceus hypoxanthus*) is classified on IUCN Red List (Near Threatened) sold for merit release in Phnom Penh, Cambodia (Gilbert et al., 2012). In the Bangkok weekend Markets, Thailand, 68,654 individuals belong to 225 bird species, and 51 bird species (exotic birds) are sold for food and pets. Several of exotic birds species were classified in the CITES Appendix I and II (Round, 1990). In addition, 1,111 of helmeted hornbills are traded to China by middleman during 2012-2014 (Collar, 2015) and 2,170 helmeted hornbills head are illegal trade from Indonesia to China (Beastall et al., 2016).

2.5 Threats to Birds in Lao PDR

The major threats to birds as well as other wild vertebrates in Lao PDR are logging, forest clearance and fragmentation, unrestricted hunting for food and trade (Thewlis et al., 1998). Traditionally, birds are hunted by local villagers for their food supply (Hansel, 2004). Hunting and illegal trade are the most threatened to bird species in Lao PDR such as white-winged duck, crested argus and green peafowl (Chauhan, 2014). Bird trades are appeared largely for food (Nash, 1993). Many species of birds in Lao PDR are seriously declined by local hunting for food and trade, and some species of birds are become local extinction (Duckworth, 1996) such as green peafowl (Evans and Timmins, 1995), hornbills, parakeets, pigeons, pheasants, partridges, doves, lapwings, egrets, magpies and crows (Fuchs et al., 2007).

Bird trade in Lao PDR has normally seen in several parts of the country (Nash, 1993; 1997; Thewlis et al., 1998; Hallam et al., 2007; Singh et al., 2007; Singh, 2008). Srikosamatara et al. (1992) has reported that 33 species of birds are traded at That Luang fresh food market, Vientiane in Lao PDR. Averagely, 17-20 birds are sold per day and 6,000-7,000 birds are sold per year. Nash (1997) has reported that thick-billed pigeon, grey peacock-pheasants, Siamese firebacks, bar-bellied pittas, and pittas, pied hornbill, great hornbill and other hornbills' species are traded as food-sources and song birds. Most alive birds are sold as pets such as hill mynas. Nash (1997) also has reported that more than 100 of hill mynas are sold in a market and 50-100 of hill mynas are smuggled to Thailand per year. In addition, some endangered species are traded in markets in Lao PDR as well as along Thai-Lao border (Srikosamatara and Suteethorn, 1994).

2.6 Conservation of Birds in Lao PDR

Bird conservation is essential for numbers of bird species in Lao PDR, but little is known. Thewlis et al. (1998) classify bird species in Lao PDR to four categories including; (1) At Risk in Laos, (2) Potentially At Risk in Laos, (3) Little Known and (4) Not At Risk in Laos. There are 42 species of At Risk in Laos category, 26 species of Potentially At Risk in Laos, 34 species of Not At Risk in Laos, and 33 species of Little Known.

In addition, the government has designed the law for wildlife and aquatic in Lao PDR. It is divided into three categories including; (1) Wildlife and aquatic prohibition category, (2) wildlife and aquatic management category and (3) wildlife and aquatic general category (National Assembly, 2007).

2.6.1 Wildlife and Aquatic Prohibition Category

It is explained in the first (I) category. In this category includes animals which are rare, near extinct, high value, and importance for develop of social-economic, environmental, educational, scientific research. They shall be managed, inspected and preserved. The animals in this category shall be permitted by the government. In this category includes 36 species of birds (Table 2.1).

2.6.2 Wildlife and Aquatic Management Category

It is explained in the second (II) category. In this category includes animals which are beneficial in terms of national economic, social, environmental interests, important for livelihoods of multi ethnic people and educational scientific research. They shall be managed, inspected, preserved, protected and controlled. In this category includes 22 species of birds (Table 2.1).

2.6.3 Wildlife and Aquatic General Category

It is explained in the third (III) category. This category includes animals which are able to reproduce wildly and naturally. They are very important for social-economic development and educational scientific research. They can be used in accordance with the law, guarantee that not threatened species, and not effected to ecological environmental system. In this category includes 5 species of birds (Table 2.1).

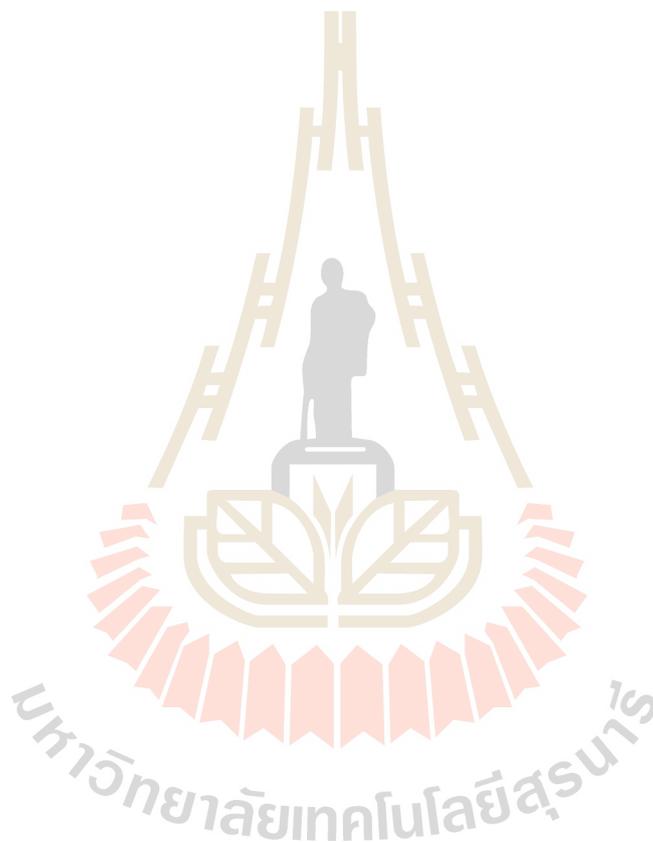


Table 2.1 Bird category lists in Lao PDR (The Forestry Division, 2009).

No	Common Name	Scientific Name	Category
Wildlife and Aquatic Prohibition Category (36 Birds Species)			Category
1	Green peafowl	<i>Pavo muticus</i>	I
2	Great hornbill	<i>Buceros bicornis</i>	I
3	Rufous-necked hornbill	<i>Aceros nipalensis</i>	I
4	Wreathed hornbill	<i>Aceros undulates</i>	I
5	All species of vultures	<i>Gyps</i> spp., <i>Egyplus</i> spp., and <i>Sarcogyps</i> spp.	I
6	Crested argus	<i>Rheinardia ocellata</i>	I
7	White-winged duck	<i>Cairina scutulata</i>	I
8	Sarus crane	<i>Grus Antigone</i>	I
9	Painted stork	<i>Mycteria leucocephala</i>	I
10	Giant ibis	<i>Pseudibis gigantean</i>	I
11	Silver pheasant	<i>Lophura nycthemera</i>	I
12	Siamese fireback	<i>Lophura diardi</i>	I
13	Gery peacock-pheasant	<i>Polyplectron bicalcarantum</i>	I
14	Woolly-necked stork	<i>Ciconia episcopus</i>	I
15	All adjutants	<i>Leptoptilos</i> spp.	I
16	Black-headed ibis	<i>Threskiornis melanocephalus</i>	I
17	Spot-bellied eagle owl	<i>Bubo nipalensis</i>	I
18	Purple swamphen	<i>Porphyrio porphyria</i>	I
19	Red-collared woodpecker	<i>Picus rabieri</i>	I

Table 2.1 Bird category lists in Lao PDR (The Forestry Division, 2009)

(Continued).

No	Common Name	Scientific Name	Category
20	Imperial eagle	<i>Aquila heliaca</i>	I
21	Green imperial pigeon	<i>Ducula aenea</i>	I
22	All tern species	<i>Strena</i> spp. and <i>Chlidonias</i> spp.	I
23	Black-necked stork	<i>Ephippiorhynchus asiaticus</i>	I
24	Masked finfoot	<i>Heliopais personata</i>	I
25	Great thick-knee	<i>Esacus recurvirostris</i>	I
26	Brahminy kite	<i>Haliastur indus</i>	I
27	Little cormorant	<i>Palacrocorax niger</i>	I
28	Cotton pygmy goose	<i>Nettapus coromandelianus</i>	I
29	River lapwing	<i>Vanellus duvaucelii</i>	I
30	Lesser fish eagle	<i>Ichthyophaga humilis</i>	I
31	Grey-headed fish eagle	<i>Ichthyophaga ichthyaetus</i>	I
32	Asian golden weaver	<i>Ploceus hypoxanthus</i>	I
33	Oriental darter	<i>Amhinga melanogaster</i>	I
34	Red-breasted parakeet	<i>Psittacula alexandri</i>	I
35	Greater coucal	<i>Centropus sinensis</i>	I
36	Eurasian hoopoe	<i>Upupa epops</i>	I
Wildlife and Aquatic Management Category (22 Birds Species)			Category
37	Oriental pied hornbill	<i>Anthracoceros albirostris</i>	II
38	Brown hornbill	<i>Anorrhinus tickelli</i>	II

Table 2.1 Bird category lists in Lao PDR (The Forestry Division, 2009)

(Continued).

No	Common Name	Scientific Name	Category
39	Hill myna	<i>Gracula relingiosa</i>	II
40	All woodpecker species	<i>Picus</i> spp.	II
41	All parakeets species	<i>Psittacula</i> spp.	II
42	Garganey	<i>Anas querquedula</i>	II
43	Red collared dove	<i>Streptopelia tranquebarica</i>	II
44	Purple heron	<i>Ardea purpurea</i>	II
45	All owls	<i>Asios</i> spp., <i>Otus</i> spp., <i>Glaucidium</i> spp., <i>Athene</i> spp., <i>Ninox</i> spp., <i>Ketupa</i> spp., and <i>Strix</i> spp.	II
46	Red-wattled lapwing	<i>Vanellus indicus</i>	II
47	Common myna	<i>Acridotheres tristis</i>	II
48	Asian koel	<i>Eudynamys scolopacea</i>	II
49	Common kingfisher	<i>Alcedo atthis</i>	II
50	Great barbet	<i>Megalaina virens</i>	II
51	Eastern spotted dove	<i>Streptopelia chinensis</i>	II
52	Pale-capped pigeon	<i>Columba panacea</i>	II
53	Watercock	<i>Gallixrex cinerea</i>	II
54	All green pigeons	<i>Treron</i> spp.	II
55	Changeable hawk eagle	<i>Spizaetus cirrhatus</i>	II
56	All egrets	<i>Egretta</i> spp.	II

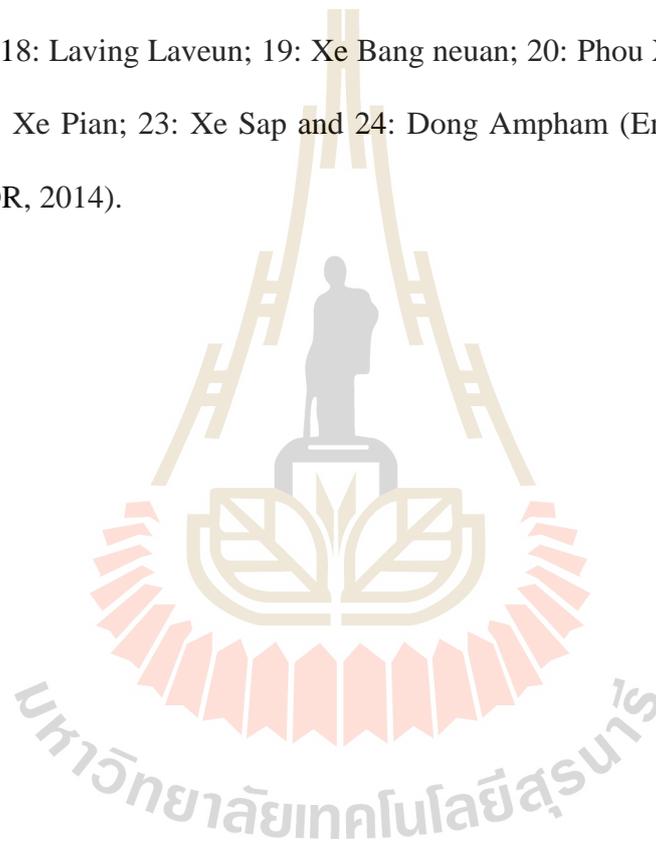
Table 2.1 Bird category lists in Lao PDR (The Forestry Division, 2009)

(Continued).

No	Common Name	Scientific Name	Category
57	All Parakeets	<i>Psittacula</i> spp.	II
58	All pitas	<i>Pitta</i> spp.	II
Wildlife and Aquatic General category (5 Birds Species)			Category
59	White breasted waterhen	<i>Amauromis phoenicurus</i>	III
60	Red junglefowl	<i>Gallus gallus</i>	III
61	Drongo species	<i>Drcrurus</i> spp.	III
62	Scaly-breasted partridge	<i>Arborophila chloropus</i>	III
63	Barred buttonquail	<i>Turmix susciter</i>	III

Furthermore, The BirdLife International has divided 27 Important Bird and Biodiversity Areas (IBAs) in Lao PDR which cover 23,850 km² including 1: Ban Nakhay, 2: Nam Neun, 3: Phou Louey, 4: Nam Ha Northern Highland, 5: Dong khangthung, 6: Mekong Channel upstream of Vientiane, 7: Mekong Channel from Phou Xiang Thong to Siphandon, 8: Upper Nam Ou, 9: Nam Xam, 10: Xe Sap, 11: Upper Xe Khaman, 12: Dong Ampham, 13: Attapu Plain, 14: Houay Kok-Houay Phalaphang, 15: Dakchung Plateau, 16: Phou Ahyon, 17: Upper Xe bangfai, 18: Hin Namno, 19: Xe Khampho/Xe Pian, 20: Xe Kong Plains, 21: Dong Kalo, 22: Siphandon, 23: Nam Chat/ Nam Pan, 24: Nakai Plateau, 25: Nakai-Nam Theun, 26: Central Khammouane Limestone, and 27: Upper Lao Mekong (Figure 2.1) (Ounekham and Inthapatha, 2003).

Therefore, Lao government has designed 24 National Biodiversity Conservation Areas (NBCAs) which cover 14% (over three million hectares) of land area in the country including 1: Phou Dean Din; 2: Phou Liphi; 3: Nam Kan; 4: Nam Ha; 5: Nam Et; 6: Phou Leuay; 7: Phou Pung Chong and Phou Saboot; 8: Nam Xam; 9: Nam Pou; 10: Phou Phanang; 11: Phou Khao Khouany; 12: Nam Kading; 13: Phou Hinpoun; 14: NaKai Nam Theun; 15: Hin Namno; 16: Phou Xang Hae; 17: Dong Phou Vieng; 18: Laving Laveun; 19: Xe Bang neuan; 20: Phou Xiengthong; 21: Dong Houasao; 22: Xe Pian; 23: Xe Sap and 24: Dong Ampham (Environment Protection Fund Lao PDR, 2014).



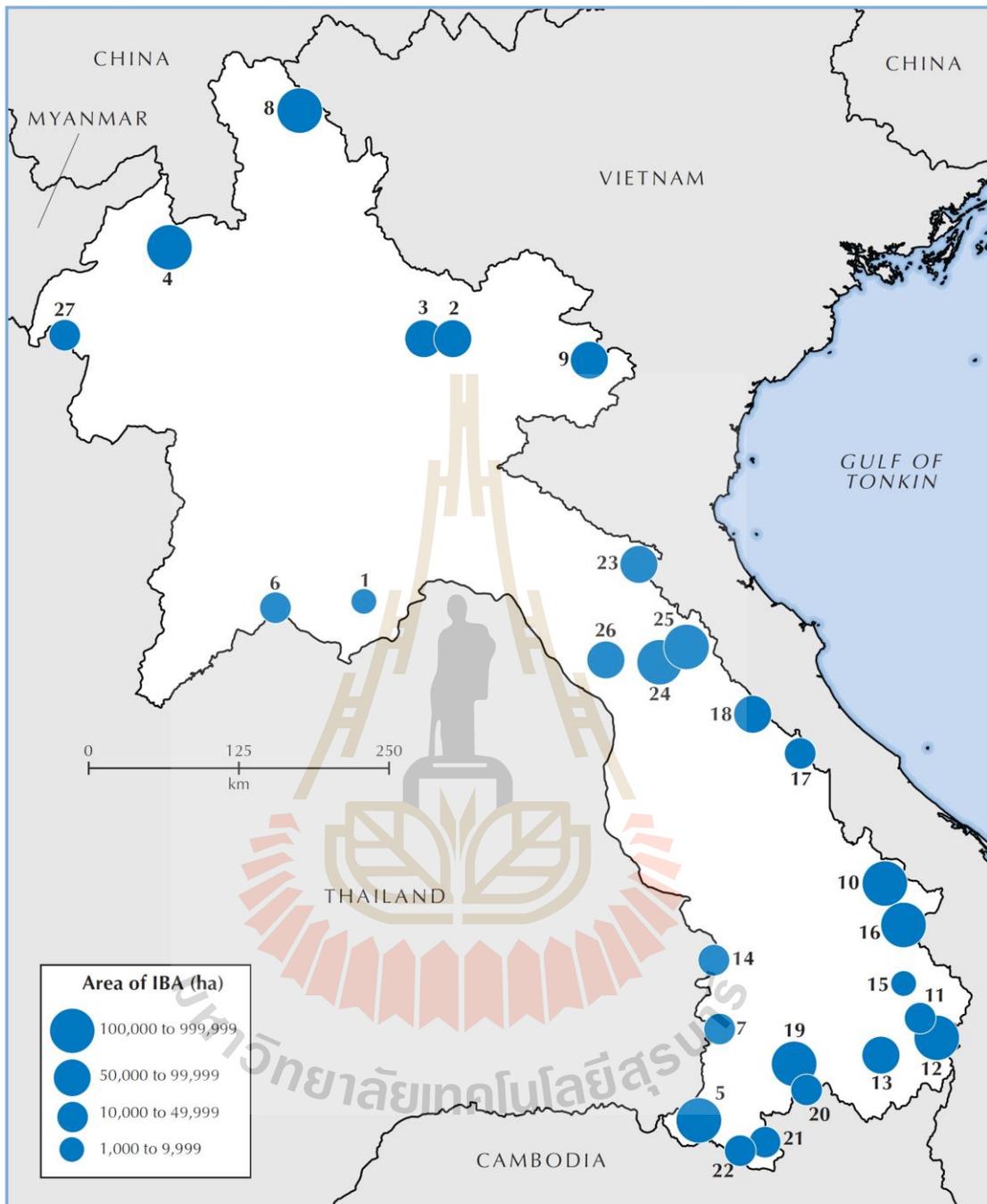


Figure 2.1 Location and size of important bird areas in Lao PDR (Ounekham and Inthapatha, 2003).

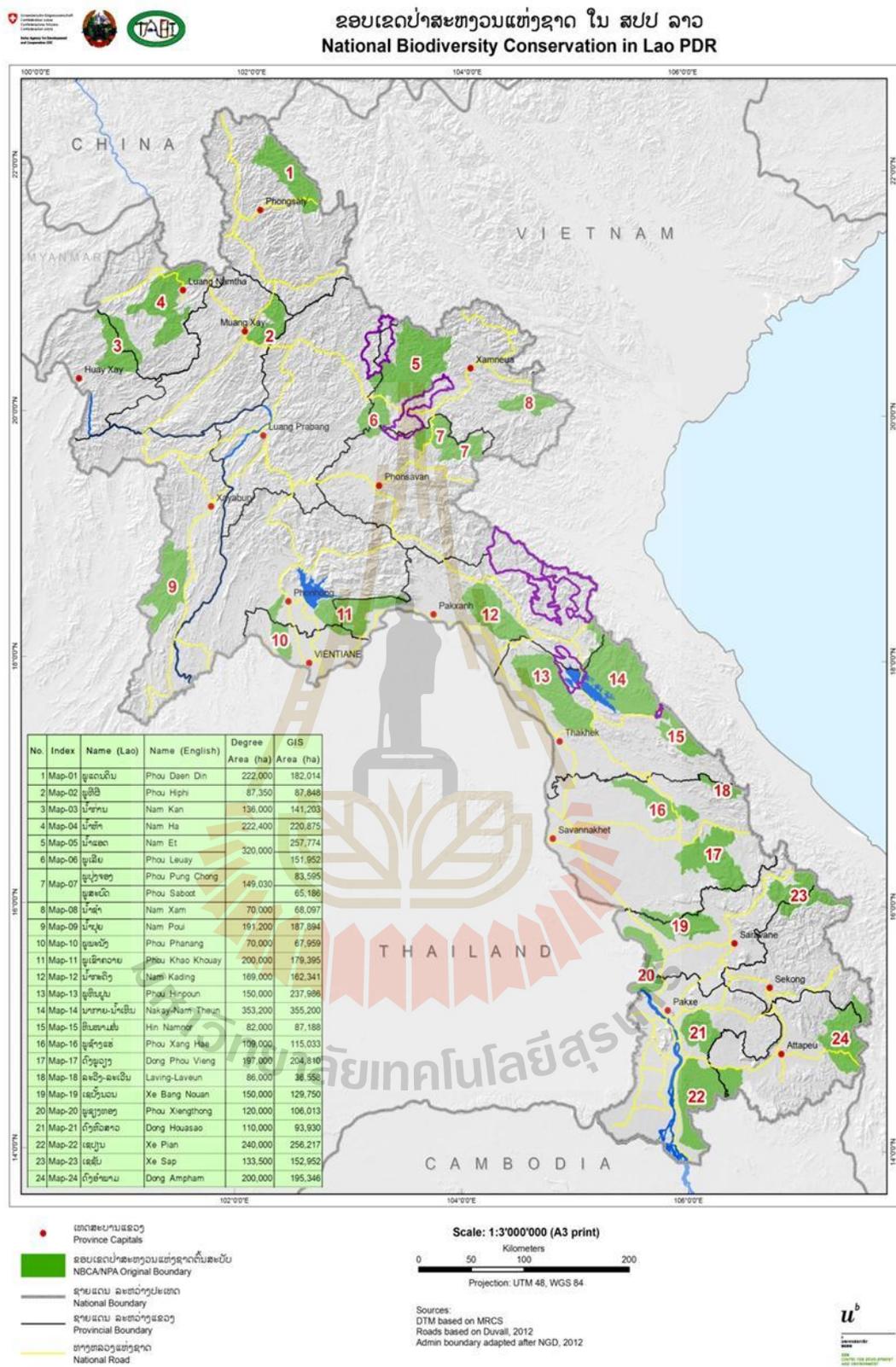


Figure 2.2 National Biodiversity Conservation Areas (NBCAs) (Environment Protection Fund Lao PDR, 2014).

2.7 National Biodiversity Conservation Areas (NBCA) Nearby the Study Area

2.7.1 Nam Kading National Biodiversity Conservation Area

2.7.1.1 Location Nam Kading NBCA is located at latitude 18°11'-18°39' N and longitude 103°54'-104°34' E in Bolikhamxay province which covers 1,570 km² (WCS, 1995b; Timmins and Duckworth, 1997; Thewlis et al., 1998). It is bisected for 59 km by Nam Kading (known as the Nam Theun). The natural habitat is linked to Phou Hin Poun and Nakai-Nam Theun NBCAs (Thewlis et al., 1998).

2.7.1.2 Geography Almost of Nam Kading is covered by evergreen or semi-evergreen forest (WCS, 1995b; Timmins and Duckworth, 1997). Nam Kading NBCA is significant area of dry evergreen forest on the Nam Ao and dry evergreen forest on several limestone outcrops in the Nadee area. The degrade areas are along the Nam Kading, Nam Theun, Nam Mouang and Nam Gnouang boundaries (Thewlis et al., 1998).

2.7.1.3 Bird in Nam Kading Bolikhamxay province is important and significant for conservation of birds (WCS, 1995b; Timmins and Duckworth, 1997; Travers et al., 2010). It is critical for the largest block of dry evergreen forest in Indochina (Travers et al., 2010). Nam Kading NBCA is the high importance for restricted species (Thewlis et al., 1998). In addition, Duckworth and Timmins et al. (1997) reported that at least 5 globally threatened birds, 12 globally near-threatened and 13 species of birds are considered regionally risk in Nam Kading NBCA.

2.7.1.4 Threat to Bird in Nam Kading NBCA Hunting birds by snares and guns are high in Nam Kading NBCA. Grey peacock-pheasant (*Polyplectron bicalcaratum*) are hunted for food and trades (Timmins and Duckworth, 1997;

Thewlis et al., 1998). Hunting birds are affected to population of bird decline and local extinction (Timmins and Evans, 1996) such as green peafowl (*Pavo muticus*) extincted in local area during 1985-1995. In addition, trading several heads and casques of great hornbill (*B. bicornis*) are traded as trophies in the village around Nam Kading NBCA and for sale in Vientiane market (Thewlis et al., 1998).

2.7.2 Phou Hin Poun National Biodiversity Conservation Area

2.7.2.1 Location Phou Hin Poun NBCA (PHP NBCA) has been known the Khammouane Limestone National Biodiversity Conservation Area before which locates as latitude 17°26'-18°05' N and longitude 104°25'-105°10' E in Khammouane province with cover 1,620 km² (Timmins, 1997; Thewlis et al., 1998). This NBCA is connected with Nakai-Nam Theun and Nam Kading biodiversity corridors. On the other hand, most lowland areas are high population density with deforestation habitat and cultivation (Timmins, 1997; Thewlis et al., 1998). It is one out of two NBCAs in Lao PDR covering representative of the central Indochina limestone and also known 51.8% is rugged limestone karst (Phiapalath et al., 2012).

2.7.2.2 Geography The feet of limestone cliffs are mainly by vegetable karst limestone at 180-850m. In addition, the northern-east of the PHP NBCA is the covered by hills and valleys with support at the tall forest (Thewlis et al., 1998). It is the most important of key species including the limestone specialists and almost this area is sparsely by vegetated karst (Timmins, 1997). The Phou Hin Poun NBCA is mostly mixed-deciduous forest covering between dry and wet season (Phiapalath et al., 2012).

2.7.2.3 Bird in Phou Hin Poun NBCA The majority of this NBCA consist of karst limestone such as pandans, cycads, and giant *euphorbia*. It is compo-

ment of an internationally important conservation area which is contiguous areas to Nakai-Nam Theun NBCA, Nakai Plateau and Nam Kading NBCA. It is connected to the other parts of conservations area like the southern habitat link (Timmins, 1997).

Two hornbills' species are found in PHP NBCA including wreathed hornbill (*Rhyticeros undulates*) and oriental pied hornbill (*Anthracoceros albirostris*). The special bird species in this NBCA are sooty babbler (*Stachyris herberti*) and leaf warbler (*Phylloscopus* sp). The abundance species of birds in this NBCA is scaly-breasted partridge (*Arborophila charltonii*), red-collared woodpecker (*Picus rabieri*), and large-scimitar babbler (*Pomatorhinus hypoleucos*; Timmins, 1997).

2.7.2.4 Threat to Bird in Phou Hin Poun NBCA The mainly threatened in this NBCA is hunting, wood collection such as *Aquillaria* tree, commercial logging, the encroachment of cultivation, forest clearance including timber removal, firewood removal, burning and heavy grazing by domestic livestock and road development (Timmins, 1997). In addition, many tools are used for hunting bird such as snares and guns (Timmins and Evans, 1996).

2.7.3 Nakhai-Nam Theun National Biodiversity Conservation Area

2.7.3.1 Location Nakai-Nam Theun NBCA is located at latitude 17°34'-18°23' N and longitude 105°02'-105°46' E (Timmins and Evans, 1996; Thewlis et al., 1998). It shares border to Vietnam 155 km in central eastern Laos, and it is situated in Nakai district, Khammouane province, Lao PDR (Coudrat, 2013). It is currently the largest protected area in Lao PDR which covers 3,445km² (Timmins and Evans, 1996; Thewlis et al., 1998).

2.7.3.2 Geography This NBCA is remarkable importance of geographical with Annamite mountain range (Tizard, 1996; Coudart, 2013). It is no-

table by endemism and a unique climatic pattern (Coudrat, 2013). Nakai-Nam Theun NBCA is affected by monsoons from Vietnam, which has a high average annual rainfall of 2,500-3,000 mm (Phiaphalath, 2009). The low elevations allow monsoons from both the south-western from Vietnam (Tizard, 1996). It is dominated by dry evergreen forest at 500-800 metres above sea level (m a.s.l.). In addition, semi-evergreen/pine forest, wet-evergreen forest is near by Vietnam border as over 600 m a.s.l. and upper mountain forest is found at the highest elevations from 1800 m a.s.l. (Timmins and Evans, 1996).

2.7.3.3 Bird in Nakai-Nam Theun NBCA Nakai-Nam Theun NBCA is significant area for biodiversity of Lao PDR (WCS, 1995a; Singh, 2008) and it is one of the most important National Biodiversity Conservation Area in Asia (Robichaud, 2002). It is important for national, global diversity and the highest priority of the country's NBCAs and is one of the largest forest blocks in Indochina (WCS, 1995a; Coudrat et al., 2014). The large forest of NBCA covers 80% forest (Robichaud et al., 2009). Nakai-Nam Theun is high important for species restricted (Thewlis et al., 1998). It is home of several threatened, recently described mammals (Robichaud et al., 2001) and edemic rodent taxa (Sanamxay et al., 2013) such as Lao langgur (*Trachypithecus laotum*; Thomas, 1921), Kha-nyou, (*Laonastes aenigmamus*; Jenkins et al., 2005), Paulina's limestone rat (*Saxatilomys paulinae*; Musser et al., 2005), saola (*Pseudoryx nghetinhensis*; Schaller and Rabinowitz, 1995), large-antlered muntjac (*Muntiacus vuquangensis*; Tuoc et al., 1994), Annamite muntjac (*M. truongsongensis*; Giao et al., 1998).

Nakai-Nam Theun NBCA is the highest species diversity of birds in a single National Biodiversity Conservation Area in Southeast Asia (Robichaud et al., 2001)

and it is the best known surveys of birds (Robichaud, 2002). New bird species is described, bare-faced bulbul (*P. Hualon*; Woxvold et al., 2009), limestone leaf warbler (*P. calciatilis*; Alstrom et al., 2010) and fairy pitta (*P. nympha*; Coudrat and Nanthavong, 2106). In addition, approximately 390 species of birds are found and 50 species can be expected in this NBCA (WCS, 1995a; Timmins and Evans, 1996). Nearly 400 species are recorded in 1994 and more are added in 1995 (Duckworth et al., 1998). Moreover, 405 birds species are identified in Nakai-Nam Theun NBCA lastly (Tobias, 1997) which are notably crested argus (*Rheinardia ocellata*) and five species of hornbills including rufous-necked hornbil (*A. nipalensis*), brown hornbill (*Anorrhinus tickelli*), wreathed hornbill (*Rhyticeros undulates*), oriental pied hornbill (*Anthracoceros albirostris*), and great hornbill (*B. bicornis*; Coudrat, 2013). In addition, This NBCA hold 11 species of globally important populations namely lesser fish-eagle (*Ichthyophaga humilis*), pied falconet (*Microhierax melanoleucos*), crested argus (*R. ocellata*), river lapwing (*Vanellus duvaucelii*), grey-head lapwing (*V. cinereus*), rufous-necked hornbill (*A. nipalensis*), brown hornbill (*A. tickelli*), blyth's kingfisher (*Alcedo Hercules*), beautiful nuthatch (*Sitta Formosa*), rufous-throated fulvetta (*Alcippe rufogularis*), and white-winged magpie (*Urocissa whiteheadi*; Timmins and Evans, 1996). Therefore, this NBCA is also found 10 species of globally threatened including white-winged duck (*Cairina scutulata*), Siamese fireback (*Lophura diardi*), crested argus (*R. ocellata*), green peafowl (*P. muticus*), Blyth's kingfisher (*A. Hercules*), rufous-necked hornbill (*A. nipalensis*), red-collared woodpecker (*Picus rabieri*), beautiful nuthatch (*S. Formosa*), short-tailed scimitar babbler (*Jabouillea danjouii*), and (*Lophura sp*). Moreover, 10 species of globally near-threatened including grey-headed fish-eagle (*Ichthyophaga ichthyaetu*), lesser fish-eagle (*Ichthyophaga hu-*

milis), pied falconet (*Microhierax melanoleucos*), yellow-vented pigeon (*Treron seimundii*), white-bellied pigeon (*Treron seiboldii*), coral-billed ground cuckoo (*Carpococcyx renauldii*), Tawny fish-owl (*Ketupa flavipes*), brown hornbill (*P. tickelli*), white-winged magpie (*U. whiteheadii*), rufous-throated fulvetta (*Alcippe rufogularis*). Furthermore, green imperial-pigeon (*Ducula aenea*) and four species are regionally at risk including crested kingfisher (*Megaceryle lugubris*), wreathed hornbill (*R. undulates*), great hornbill (*B. bicornis*), and one species is national historical decline including river lapwing (*Vanellus duvucellii*; Timmins and Evans, 1996). In addition, 24 key species of birds are found in small area of Nakai-Nam Theun NBCA which are found four hornbills such as brown hornbill (*P. tickelli*), rufous-necked hornbill (*A. nipalensis*), wreathed hornbill (*R. undulates*), and great hornbill (*B. bicornis*; Tizard, 1996).

2.7.3.4 Threat to Bird in the Nakai-Nam Theun NBCA Several global threatened species of birds are threatened by forest clearance and elevate hunting levels (Tizard, 1996). The largest birds are the main focus of wildlife hunting (WCS, 1995a; Timmins and Evans, 1996). Hunting bird is highly found in this NBCA from local people by using snares and guns (WCS, 1995a; WCS, 1996; Timmins and Evans, 1996; Tobias, 1997). Coudrat (2013) reported that 3,239 snares is collected with 41 poacher camps is destroyed including old and recent camps. In addition, several species of birds is hunted by snare including grey peacock-pheasant (*P. bicalcaratum*), crested argus (*R. ocellata*), Silver pheasant (*Lophura nycthemera*), white-winged duck (*Asarcornis scutulata*), green peafowl (*P. muticus*), Siamese fireback (*Lophura diardi*), wreathed hornbills (*Rhyticeros undulates*), and rufous-necked hornbill (*A. nipalensis*; Tizard, 1996; Thewlis et al., 1998; Timmins and Evans, 1996) and

14 gunshots is heard within the 87 km² covered in Nakai-Nam Theun NBCA (Courdat, 2013).

Hunting and bird trade are common traded in this area (Robichaud, 2002). For instance, 8 species of birds are found on trade at Lak Sao local market including crested argus (*R. ocellata*), yellow-vented pigeon (*T. seimundii*), red-collared woodpecker (*Picus rabieri*), white-billed green-pigeon (*T. seiboldii*), blue-naped pitta (*P. nipalensis*), Fujian niltava (*Niltava davidi*), mountain hawk eagle (*Spizaetus nipalensis*), blue-naped pitta (*P. nipalensis*; Tizard, 1996; Timmins and Evans, 1996; Thewlis et al., 1998; Evans and Timmins, 1998); Three species are traded in Thong Pei local market including crested argus (*R. ocellata*), silver pheasant (*L. nycthemera*), coral-billed ground cuckoo (*Carpococcyx renauldi*; Timmins and Evans, 1996; Tizard 1996) and one species are traded in Na Pei local market such crested argus (*R. ocellata*; Thewlis et al., 1998). Several heads and casques of great hornbill (*B. bicornis*) are seen as trophies in village around Nakai-Nam Theun NBCA, Nakai Plateau, Nam Theun Extension (Thewlis et al., 1998).

2.7.4 Hin Namno National Biodiversity Conservation Area

2.7.4.1 Location Hin Namno National Biodiversity Conservation Area is located at latitude 17°15'-17°40' N and longitude 105°43'-106°09' E (Timmins and Khounboline, 1996; Thewlis et al., 1998) which is about 450 km from Vientiane Capital. It situated in Bualapha District, Khammouane province, which is covering 820 km². It closes to the Nakai Nam Theun NBCA on the southeast and connects to the international border of Phong Nha Ke Bang Natural World Heritage in Vietnam (Timmins and Khounboline, 1996). Hin Namno NBCA is extremely rich of biodiver-

sity and a part of one of the largest limestone ecosystems in Southeast Asia (WWF, 2001).

2.7.4.2 Geography Hin Namno NBCA is limestone characteristic which is difficult to access such as research activities (Phiaphalath et al., 2010). It is a separate of limestone karst vegetable (Timmins and Khounboline, 1996). It is mostly forest in mid-level limestone mountain to foothill. The dominant character is the bare rock on the top and with some bushes. In addition, the foothills are found the large tree with the highest 45 m. The small and medium trees are also depending on the degree of gradient (Phiaphalath et al., 2010). The border of Hin Namno connects to Phou Tcheung Mountain at the northern and the Xe Bang Fai to the south (Timmins and Khounboline, 1996). Hin Namno NBCA is a part of the northern Annamite mountain range which has two main distinct season including rainy and dry seasons (Timmins and Khounboline, 1996; Phiaphalath, 2009). The rainy season starts from June to October and the dry season starts from November to May (Phiaphalath, 2009).

2.7.4.3 Bird in Hin Namno Hin Namno NBCA is high biodiversity importance party and located in central Indochinese limestone. It has high national and international conservation values (Walston and Vinton, 1999). It is high important for species restricted and endemic to the Annamite mountain range (Thewlis et al., 1998) such as leaf-warbler (*Phylloscopus*) species and sooty babbler (*Stachyris herberti*), respectively (Timmins and Khounboline, 1996). Hin Namno NBCA is one of 27 the Important Bird Area of Lao PDR. In addition, four hornbills species including brown hornbill (*A. tickelli*), wreathed hornbill (*R. undulates*), great hornbill (*B. rhinoceros*), and oriental pied hornbill (*A. albirostris*) are found in the same habitat in this NBCA (Walston and Vinton, 1999; Timmins and Khounboline, 1996) which are

total 217 birds species found in this area while seven species are vulnerable species including Siamese fireback (*L. diardi*), crested argus (*R. ocellata*), green Peafowl (*P. muticus*), red-collared woodpecker (*Picus rabieri*), rufous-necked hornbill (*A. nipalensis*), spot-billed pelican (*Pelecanus philippensis*), sooty babbler (*S. herberti*). One species is endangered species including white wing duck (*Cairana scutulata*) and eleven species are nearly threatened species including brown hornbill (*A. tickelli*), coral-billed ground cuckoo (*Carpococcyx renauldi*), yellow-vented green pigeon (*Treron seimundi*), lesser fish eagle (*Ichthyophaga humillis*), rufous-winged buzzard (*Butastur liventer*), pied falconet (*Microhierax melanoleucos*), blue-rumped pitta (*Pitta soror*), bar-bellied pitta (*Pitta elliotii*), white-winged magpie (*Urocissa whiteheadi*), Indochinese green magpie (*Cissa hypoleuca*), rufous-throated fulvetta (*Alcippe rufogularis*; Walston and Vinton, 1999).

2.7.4.4 Threat to Bird in the Hin Namno The high threats are along the Lao-Viet border which are high of disturbance to birds from local people. In addition, hunting large birds and trade are known in this area (Timmins and Khounbouline, 1996; Phiaphalath et al., 2010). The most serious threats in Hin Namno NBCA are from Vietnam (Walston and Vinton, 1999).

2.7.5 Phou Xang He National Biodiversity Conservation Area

2.7.5.1 Location Phou Xang He National Biodiversity Conservation Area (PXH) covers 1140 km² of south-central Lao PDR which is located as latitude 16°42'-17°04' N and longitude 105°19'-106°06' E (Duckworth et al., 1993; Thewlis et al., 1995; Boonratana, 1998; Thewlis et al., 1998). It is located in Savannakhet province which covers five district including Villaburi to the north, Atsaphone to the west, Xepong to the east, Phalanxai and Phin to the south (Boonratana, 1998). It is high

200-500 m.a.s.l. The flatland corridor with Phou Hinho is also known in the hilly regions of Phou Xang He (Duckworth et al., 1993).

2.7.5.2 Geography Phou Xang He is known in three main habitats including semi-evergreen forest, mixed deciduous forest and scrub. Semi-evergreen forest is the forest type formed a mosaic with mixed deciduous forest, especially in the south on hills north and east of Ban Nalay which is low structure canopy 10-15m. The common habitat is known the mixed deciduous forest on the Phou Xang He hills. The most deciduous type is around open area to the taller forest. The habitat is prone to burning, especially the drier type and more open area. The judging from the photographs and in the south around Ban Nalay are found scrub on the plateau natural on the rock outcrops and sparsely vegetated grassy. The main area of Phou Xang He covers four rivers including Xe Kong, Xe Kang, Houey Gngang and Houey Tin-Gnalon. The vegetation along these rivers resembled surrounding forest (Duckworth et al., 1993).

2.7.5.3 Bird in Phou Xang He The avian species are known at Phou Xang He as least 102 species which including 17 key species including bar-backed partridge (*Arborophila brunneipectus*), Siamese fireback (*Lophura diardi*), grey peacock-pheasant (*Polyplectron bicalcaratum*), ruddy kingfisher (*Halcyon coromanda*), brown hornbill (*Ptilolaemus tickelli*), wreathed hornbill (*R. undulates*), red-vented barbet (*Megalaima lagrandieri*), pale-headed woodpecker (*Gecinulus grantia*), red-collared woodpecker (*Picus rabieri*), black-headed woodpecker (*Picus erythropygius*), bar-bellied pitta (*Pitta ellioti*), grey-faced tit-babbler (*Macronous kellyi*), rufous-throated fulvetta (*Alcippe ruficularis*), fulvetta sp. (*A. Alcippe* cf. *A. peracensis*), ratchet-tailed Treepie (*Temnurus temnurus*), golden-crested myna (*Ampeliceps coro-*

natus) and common hill myna (*Gracula religiosa*; Duckworth et al., 1993). In addition, Boonratana (1998) reported that 206 bird species were found in Phou Xang He NBCA.

2.7.5.4 Threat to Bird in the Phou Xang He Several bird species are hunted by local people from this area which is hunted for foods and pets. Snares and guns are using of hunting birds which are included drongos, orioles, partridges, pheasants, pittas and parakeets (Duckworth et al., 1993).

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CHAPTER III

SPECIES DIVERSITY OF BIRD TRADING IN LOCAL MARKETS IN CENTRAL LAO PDR

3.1 Abstract

Species of birds are not estimated properly in Lao PDR due to the increase of new species discovery in recent years. In contrast, hunting of birds for food and trade are seen in several parts of the country. Trading of birds are extended from local to internal and internationals. Therefore, this study aims to provide the information of the diversity of birds, numbers and value of each bird species. Field observation was conducted from February 2015 to February 2016. Total 1,020 individuals of birds were found on trading in local markets, in these, 718 individuals were identified to 13 orders, 30 families, 85 species, and 302 birds were unidentified. Black-crested bulbul (*Pycnonotus melanicterus*, 183 individuals), red junglefowl (*Gallus gallus*, 85) and eastern spotted dove (*Spilopelia chinensis*, 81) were observed in the highest numbers, respectively. The more species diversity and abundance were found at Kok (489 individuals of 47 species) and Chout Song (309 individuals of 40 species) than others local markets. Species diversity of bird and abundance were found more in February and April than other months. The most expensive species and the cheapest species were common hill myna (*Gracula religiosa*) with the price of US\$ 61.30 and black-headed bulbul (*Pycnonotus atriceps*) with the price of US\$ 0.25 per individual,

respectively. This study shows high species diversity and abundance of birds on trade at local markets in central Lao PDR, and this is the first study of bird trading in the areas.

3.2 Introduction

Southeast Asia (Myanmar, Thailand, Malaysia, Singapore, Indonesia, Timor-Leste, Brunei Darussalam, Philippines, Cambodia, Vietnam and Lao PDR) is covered by 4 of biodiversity hotspots including Sundaland, Wallacea, Philippines and Indo-Burma (Myers et al., 2000). It includes nearly 500 species of mammals (Francis, 2008), 1,327 species of birds (Robson, 2008), more than 1,000 species of reptiles (Das, 2010) and more than 700 species of amphibians (Baker, 2015). However, the region has currently the highest rate of deforestation which effects to wildlife extinction. It is also a central hotspot for wildlife trade (Sodhi et al., 2004).

Lao People's Democratic Republic (Lao PDR) is a hotspot for biodiversity, especially rare and endemic species (Tordoff et al., 2012). To date, more than 1,140 species of terrestrial vertebrates were recorded from the country (Duckworth et al., 1999) including 225 species of mammals (Francis, 2008), more than 700 species of birds (Duckworth et al., 1999), 198 species of reptiles (Luu et al., 2013) and more than 103 species of amphibians (Luu et al., 2014a). In the recent years, many new species of terrestrial vertebrates were discovered from the country including mammals (Jenkins and Robinson, 2002; Robinson et al., 2003; Jenkins et al., 2005; Musser et al., 2005; Guillen-Servent and Francis, 2006; Francis and Eger, 2012; Gorfol et al., 2014), birds (Duckworth et al., 2001; 2002; Evans, 2001; Duckworth and Tizard, 2003; Duckworth 2006; 2009; Eve, 2007; Duckworth and Evans, 2007; Woxvold et

al., 2009; Alstrom et al., 2010; Coudrat and Nanthavong, 2106), reptiles (David et al., 2004; 2012; Vogel et al., 2004; 2012; Nguyen et al., 2010; 2014; Tri and Pauwels, 2010; Luu et al., 2014b; 2014c; Nazarov et al., 2014; Schneider et al., 2014; Teynie et al., 2015; Tri et al., 2015) and amphibians (Stuart and Papenfuss, 2002; Bain and Truong, 2004; Ohler et al., 2004; Stuart and Heatwole, 2004; Bain and Stuart, 2005; Stuart and Bain, 2005; Stuart and Chan-Ard, 2005; Stuart et al., 2005; 2010; 2012; 2013; Bain et al., 2006; Rowley et al., 2010; Chan et al., 2013).

However, Lao PDR is a high rate of deforestation (Thewlis et al., 1998). The major threats to birds and other wild vertebrates in Lao PDR are loss of habitat because of logging, accelerated forest clearance, fragmentation on a large scale for rice field and unlimited hunting (Thewlis et al., 1998; Duckworth et al., 1999). Hunting and illegal trade are declined the population of many species of birds seriously, and some species are local extinction (Duckworth, 1996) such as green peafowl (*Pavo muticus*; Evans and Timmins, 1995; Chauhan, 2014), white-winged duck (*Asarcornis scutulata*, crested argus (*Rheinardia ocellata*; Chauhan, 2014), hornbills, parakeets, pigeons, pheasants, partridges, doves, lapwings, egrets, magpies and crows (Fuchs et al., 2007). Traditionally, birds are hunted by local villagers for their food supply (Hansel, 2004) but recently hunting of birds is mainly for trade (Thewlis et al., 1998; Duckworth et al., 1999).

Bird trading in Lao PDR is still extended currently from local to internal, internationals, because they are used as food, pets, traditional medicines and decorations (Srikosamatara and Suteethorn, 1994; Nooren and Claride, 2001) which has normally seen in several parts of the country (Nash, 1993; 1997; Singh, 2008). Moreover, it was found that 33 species of birds trade at That Luang fresh food market

in Vientiane capital, Lao PDR (Srikosamatara et al., 1992). In these species, three species are classified as Near Threatened (grey-headed fish-eagle *Ichthyophaga ichthyaetus*, alexandrine parakeet *Psittacula eupatria*, red-breasted parakeet *Psittacula alexandri*), and one is Endangered (green peafowl). Averagely, 17-20 birds were sold per day, and 6,000-7,000 birds were sold per year (Srikosamatara et al., 1992). Additionally, 74 pieces including (casques, beads and pendants) of helmeted hornbill (*Rhinoplax vigil*; Critically Endangered) were observed as international trade in three locations including Golden Triangle Economic Zone, Luang Prabang, and Vientiane Lao PDR (Krishnasamy et al., 2016).

As aforementioned, there were limited data regarding bird trading in Lao PDR. Thus, the present study observed and documented bird trading in local markets in central Lao PDR. This study provided information regarding the diversity of birds and their related of numbers and value of each bird species, particularly on local markets in two provinces (Bolikhamxay and Khammouane) in central Lao PDR. These two provinces are important areas for rare and threatened species in Southeast Asia as well as the hotspot for birds in Lao PDR (Tobias et al., 1998; Ounekham and Inthapatha, 2003; Strange, 2013). High consumption (Hallam et al., 2007) and high hunting rate from local people (Coudrat et al., 2014) are also found in these two provinces.

3.3 Materials and Methods

Bird trade was observed in 8 local markets of Bolikhamxay and Khammouane provinces in central Lao PDR from February 2015 to February 2016, three local markets in Bolikhamxay (Lak Sao, Na Pei and Thong Pei) and five local markets in

Khammouane (Chout Neuang, Chout Song, Kok, Phouthavong, Khounkham) (Figure 3.1).

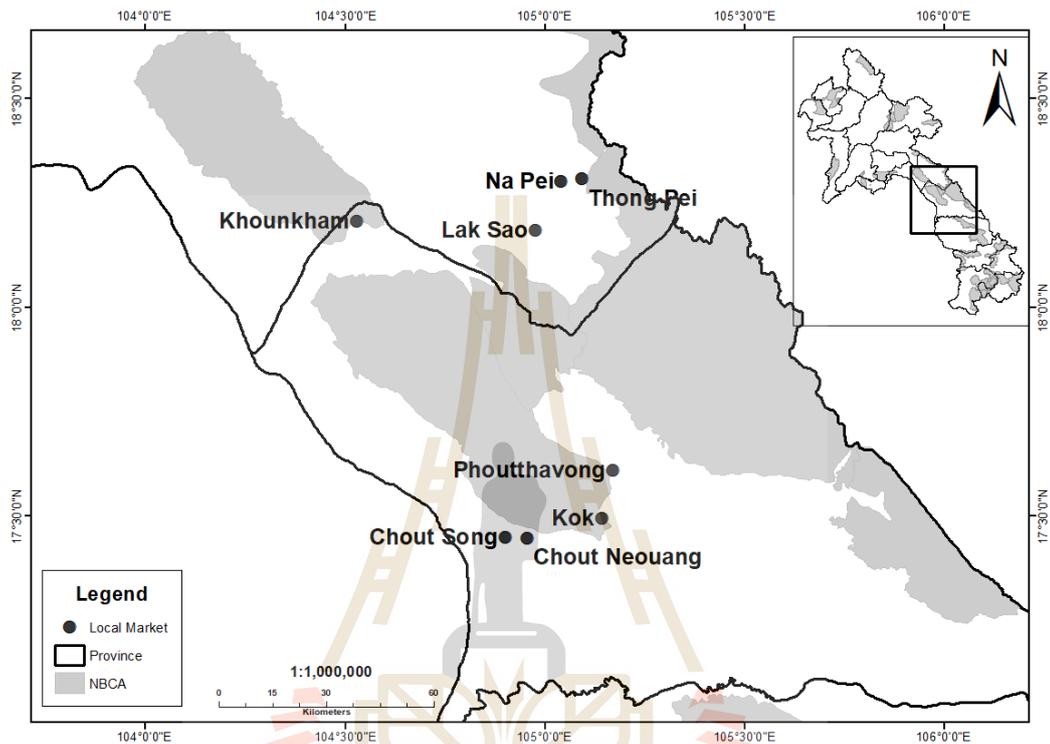


Figure 3.1 Map of location of the study; eight local markets of two provinces in central Lao PDR.

These markets are near five National Biodiversity Conservation Areas (NBCAs) (known as National Protected Areas; NPAs), namely Nam Kading, Phou Hin Poun (known as Khammouane Limestone), Nakai-Nam Theun, Hin Namno and Phou Xang He, which are hotspots for biodiversity, especially Nam Kading, Khammouane Limestone, Namkai-Nam Thuen and Hin Namno and are the Important Bird and Biodiversity Areas (IBA) (Ounekham and Inthapatha, 2003).

Six field observations were conducted between February 2015 and February 2016. Each time was observed in morning (08:30-11:30) and afternoon (13:30-17:00), and two days for each local market. In each observation, the number and value of each bird species found in each local market were counted and recorded using data collection forms. Species of birds were identified following various guide books including Robson (2008) and Naphitapat et al. (2012).

To assess species richness of birds found in local markets, sample-based rarefaction curve was generated using EstimateS (Colwell 2013). Number and value for each species were evaluated minimum, maximum, mean, and standard deviation using software SPSS version 17.0 for Windows (SPSS Inc., Chicago, IL, USA). The value was converted from Laotian Kip to US dollar, considering 1 US\$ = 8,156.55 LAK on November 10, 2015. One-way ANOVA was run to test the differentiation of the value of each species in each local market. The number of each species found in each local market was lower than three samples ($n < 3$) excluding from analysis.

3.4 Results

Total 1,020 birds were found during the survey within 48 days. In addition, 718 birds were identified to 85 species, represented to 13 orders, 30 families, and 302 birds were unidentified species based on their feather were removed (Table 3.1, Figure 3.2). Furthermore, average of 21.25 birds were sold per day and approximately 7,756.25 birds per year. However, the highest number of birds was sold in Kok and Chout Song local markets with averaged number of 14,873.75 birds and 9,398.75 birds, respectively. Passeriformes (49.41% of all species), Piciformes (8.24%), Columbiformes (7.06%), Pelecaniformes (7.06%), Strigiformes (7.06%), Galliformes

(4.71%), Cuculiformes (3.53%), Accipitriformes (3.53%), Coraciiformes (2.35%), Gruiformes (2.35%), Charadriiformes (2.35%), Anseriformes (1.18%) and Psittaciformes (1.18%) were the most frequently observed orders (Figure 3.3). Muscicapidae (11.76% of all species), Pycnonotidae (8.24%), Columbidae (7.06%), Timaliidae (7.06%), Ardeidae (7.06%), Strigidae (5.88%), Phasianidae (4.71%), Dicruridae (4.71%), Picidae (4.71%), Turdidae (3.53%), Megalaimidae (3.53%), Cuculidae (3.53%), Accipitridae (3.53%), Sturnidae (2.35%), Chloropseidae (2.35%), Rallidae (2.35%), Turnicidae (2.35%), Stenostriidae (1.18%), Oriolidae (1.18%), Pittidae (1.18%), Monarchidae (1.18%), Eurylaimidae (1.18%), Nectariniidae (1.18%), Irenidae (1.18%), Estrildidae (1.18%), Tytonidae (1.18%), Alcedinidae (1.18%), Coraciidae (1.18%), Anatidae (1.18%) and Psittacidae (1.18%) were the most frequently observed families (Figure 3.4).

Species with high abundances including black-crested bulbul (*Pycnonotus flaviventris*), red junglefowl (*Gallus gallus*), and eastern spotted dove (*Spilopelia chinensis*) with 183, 85 and 81 individuals were found, respectively. Between 10-50 individuals were found among 12 species, and fewer than 10 individuals were found among 73 species (Table 3.1).

Species diversity and abundance of bird trade were found the highest in Kok local market (489 individuals of 47 species) and Chout Song (309 individuals of 40 species). The fewer numbers of species were found in another local markets including Chout Neouang (42 individuals of 15 species), Khounkham (25 individuals of 7 species), Lak Sao (48 individuals of 7 species), Phouthavong (11 individuals of 5 species) and Thong Pei (96 individuals of 4 species) (Figure 3, Figure 4). However, no bird was found on trade in Na Pei local market.

High species diversity and abundance were found in dry season, February (317 individuals of 25 species in 2015; 328 individuals of 40 species in 2016) and April (141 individuals of 43 species). In contrast, low species diversity and abundance were found in wet season, June (23 individuals of 14 species), August (8 individuals of 5 species) and November (203 individuals of 18 species) (Figure 3.5).

The most expensive species of bird was common hill myna (*Gracula religiosa*) with averaged price of US\$ 61.30 (n=5) per individual, and the species with the lowest value was black-headed bulbul (*Pycnonotus atriceps*) with averaged price of 0.97 (0.25-1.23; n=23) (Table 3.2). Male and female birds in some species were different in prices such as red junglefowl, Siamese fireback (*Lophura diardi*) and silver pheasant (*Lophura nycthemera*) with averaged price of US\$ 8.04 (6.13-9.81) for males and 5.99 (3.68-7.36) for females, 10.63 (9.81-12.26) and 7.36 (6.13-9.81), 15.24 (8.58-18.39) and 11.44 (9.81-12.26), respectively. Dead and alive birds in some species were different in prices including red junglefowl (US\$ 3.68-9.20 for dead birds; 9.81 for alive bird), oriental turtle dove (*Streptopelia orientalis*) (2.45; 3.07), eastern spotted dove (1.84-3.68; 1.84-6.13), thick-billed green-pigeon (*Treron curvirostra*) (1.84-3.68; 2.45-3.68), stripe-throated bulbul (*Pycnonotus finlaysoni*) (0.28-1.23; 1.23-2.45), black-crested bulbul (0.61-6.13; 0.61-2.45), black-headed bulbul (0.25-0.61; 1.23), grey-eyed bulbul (*Iole propinqua*) (0.61; 1.23), greater racquet-tailed drongo (*Dicrurus paradiseus*) (1.23-1.84; 1.23-2.45), black drongo (*Dicrurus macrocerus*) (0.61; 1.23), white-rumped shama (*Copsychus malabaricus*) (0.61; 1.23), scaly-breasted munia (*Lonchura punctulata*) (0.28; 0.61), blue-whistling-thrush (*Myophonus caeruleus*) (1.23; 2.45), collared owlet (*Glaucidium brodiei*) (1.23; 2.45), oriental scops-owl (*Otus sunia*) (1.84; 1.23), greater coucal (*Centropus*

sinensis) (1.23-1.84; 3.07), banded kingfisher (*Lacedo pulchella*) (1.23; 1.23-6.13), Chinese pond heron (*Ardeola bacchus*) (2.45; 1.84) and common moorhen (*Gallinula chloropus*) (1.23-2.45; 1.84).

The value differentiation of 8 species out of 85 was evaluated, because 77 species were excluded from the analysis based on fewer numbers of individual found in each local market fewer than 3 individuals. The value of 7 out of 8 species was significantly different between each local market ($P < 0.05$). In comparison the value among eight local markets, it was found that the value of yellow-vented green-pigeon was not significantly different, 4 (grey-capped emerald dove, silver pheasant, eastern spotted dove, and black-headed bulbul) were significantly different between two local markets ($P < 0.03$, $P < 0.03$, $P < 0.01$, and $P < 0.001$), and 3 (red junglefowl, stripe-throated bulbul, and black-crested bulbul) were significantly different among local markets ($P < 0.001$, $P < 0.001$, and $P < 0.01$), respectively (Table 3.3).

All species of bird findings were classified as Least Concern in the International Union for Conservation of Nature (IUCN) Red Lists of Threatened Species (IUCN, 2017). However, one species, such as common hill myna was classified in Appendix II of the Convention on International Trade in Endangered of Wild Fauna and Flora (CITES) (CITES, 2017) (Table 3.1). In addition, 28 species of birds were classified in the Lao Wildlife and Aquatic Animal Law (The Forestry Division, 2009); three species were classified as the Wildlife Prohibition Category (Category I) including Siamese fireback, silver pheasant, and greater coucal; 23 species were classified as the Wildlife Management Category or (Category II) including eastern spotted dove, thick-billed green-pigeon, yellow-vented green-pigeon (*Treron seimundi*), greater racquet-tailed drongo, black drongo, ashy drongo (*Dicruus*

leucophaeus), hair-crested drongo (*Dicrurus hottentottus*), blue pitta (*Pitta cyanea*), common myna (*Acridotheres tristis*), common hill myna, laced woodpecker (*Picus vittatus*), bay woodpecker (*Blythipicus pyrrhotis*), rufous woodpecker (*Micropternus brachyurus*), greater yellownape (*Chrysophlegma flavinucha*), collared owlet, collared scops-owl (*Otus lettia*), oriental scops-owl, Asian barred owlet (*Glaucidium cuculoides*), spotted owlet (*Athene brama*), oriental bay-owl (*Phodilus badius*), little egret (*Egretta garzetta*), purple heron (*Ardea purpurea*) and barred buttonquail (*Turnix suscitator*), and two species were classified as the Wildlife General Category or (Category III) including red junglefowl and white-breasted waterhen (*Amaurornis phoenicurus*) (Appendix A). In addition, 67 species of birds were classified on resident, 14 winter visitors, 3 migrations, and 1 winter, respectively (Duckworth et al., 1999) (Table 3.1). Furthermore, 66 and 17 species of birds were found on trading in dry season and wet seasons, respectively. In addition, 10 species of birds were found in both rainy and dry seasons including red junglefowl, silver pheasant, eastern-spotted dove, barred-cuckoo dove (*Macropygia unchall*), thick-billed green-pigeon, stripe-throated bulbul (*Pycnonotus finlaysoni*), black-crested bulbul (*Pycnonotus flaviventris*), greater racket-tailed drongo, blue-whistling-thrush (*Myophonus caeruleus*), green-eared barbet (*Megalaima faiostricta*), lineated barbet (*Megalaima lineata*), oriental bay owl (*Phodilus badius*), Indian roller (*Coracias benghalensis*), greater coucal (*Centropus sinensis*), black bittern (*Dupetor flavicollis*), rufous-winged buzzard (*Butastur liventer*), white-breasted waterhen, yellow-legged buttonquail (*Turnix tanki*), and barred buttonquail.

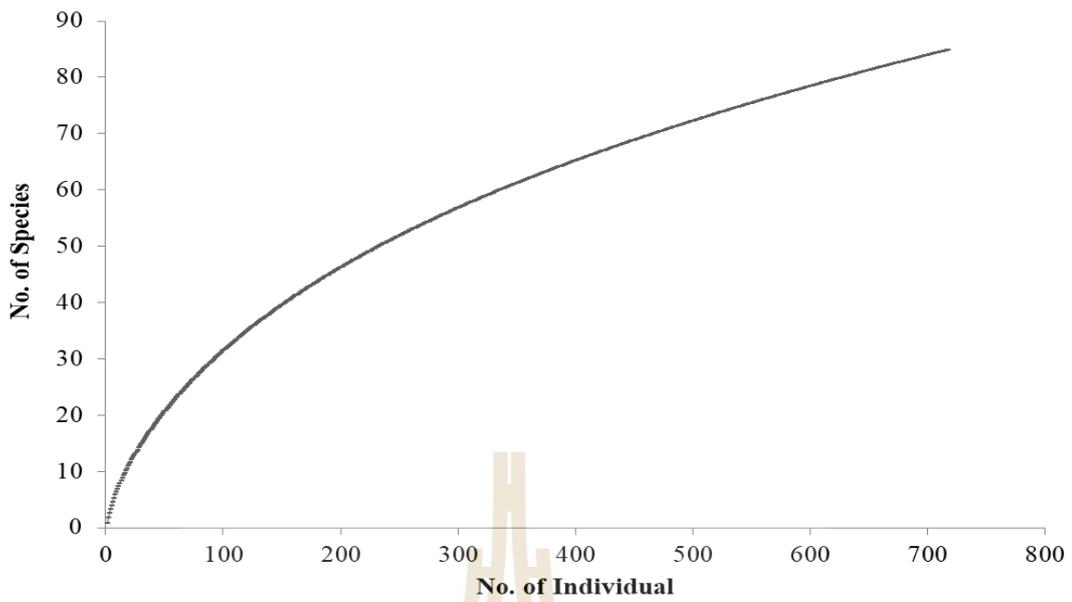


Figure 3.2 Bird species on rarefaction curve based on 48 observation days to 8 local markets of Bolikhamxay and Khammouane provinces.

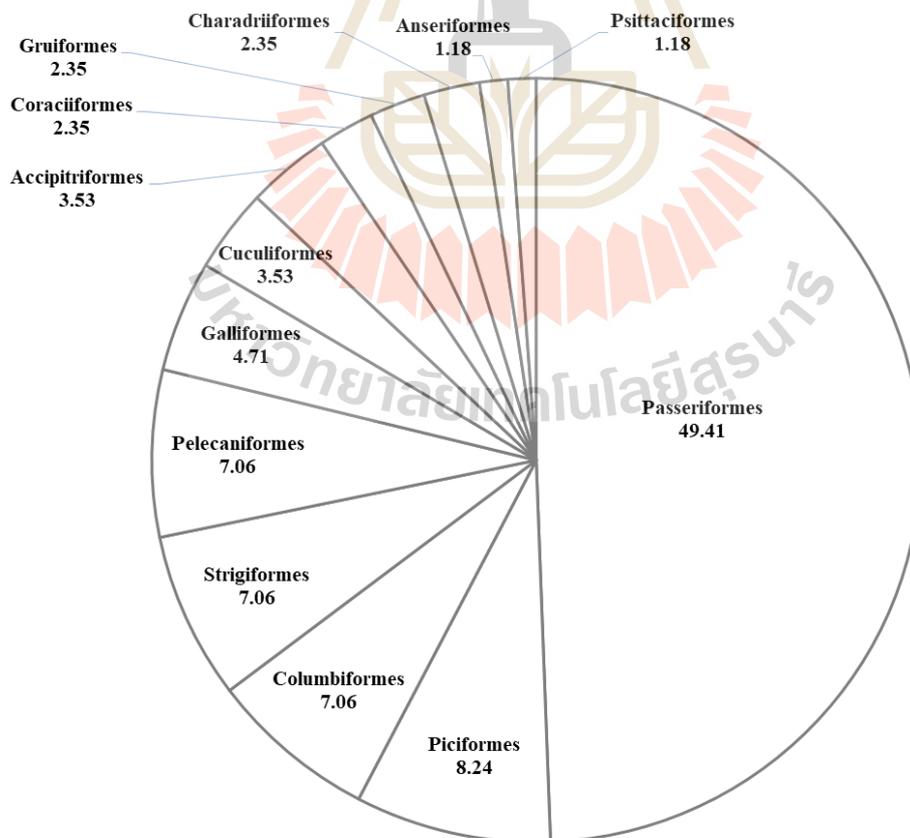


Figure 3.3 Percentage of orders of bird trade in local markets.

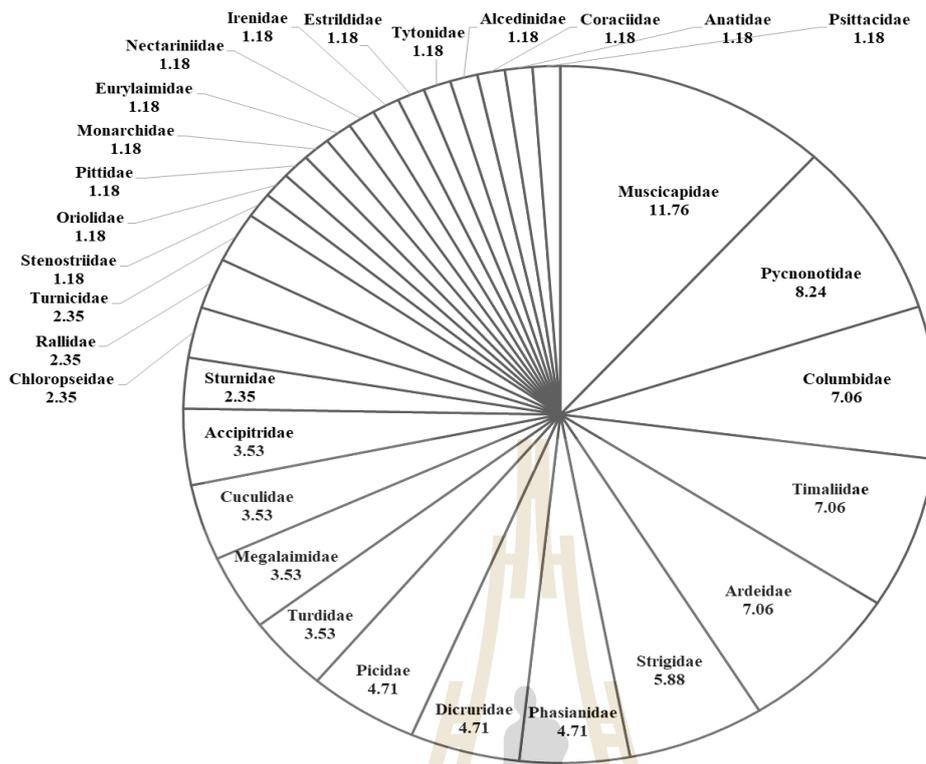


Figure 3.4 Percentage of families of bird trade in local markets.

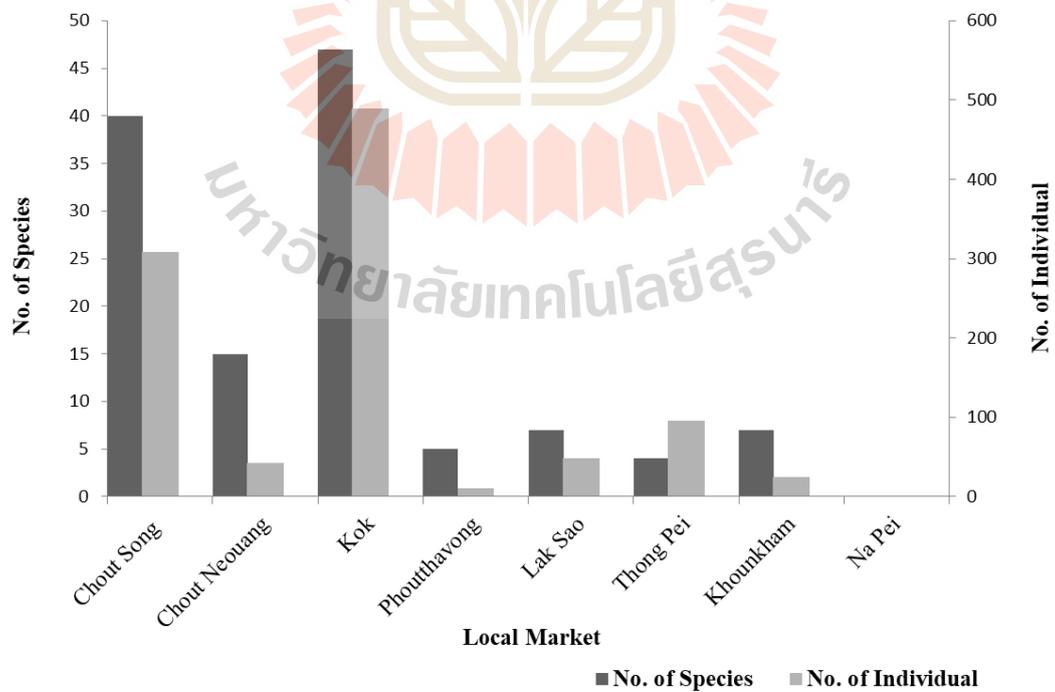


Figure 3.5 Species and individuals of bird in each local market, central Lao PDR.

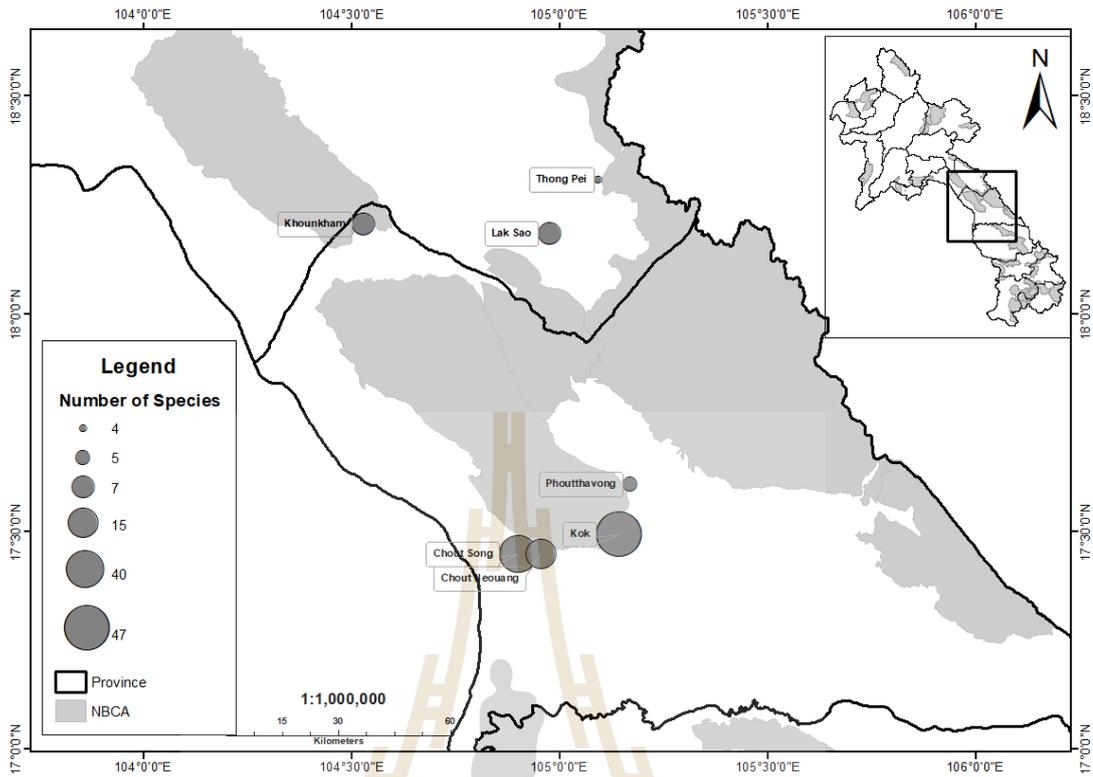


Figure 3.6 Hotspot species of bird trading in local markets, central Lao PDR.

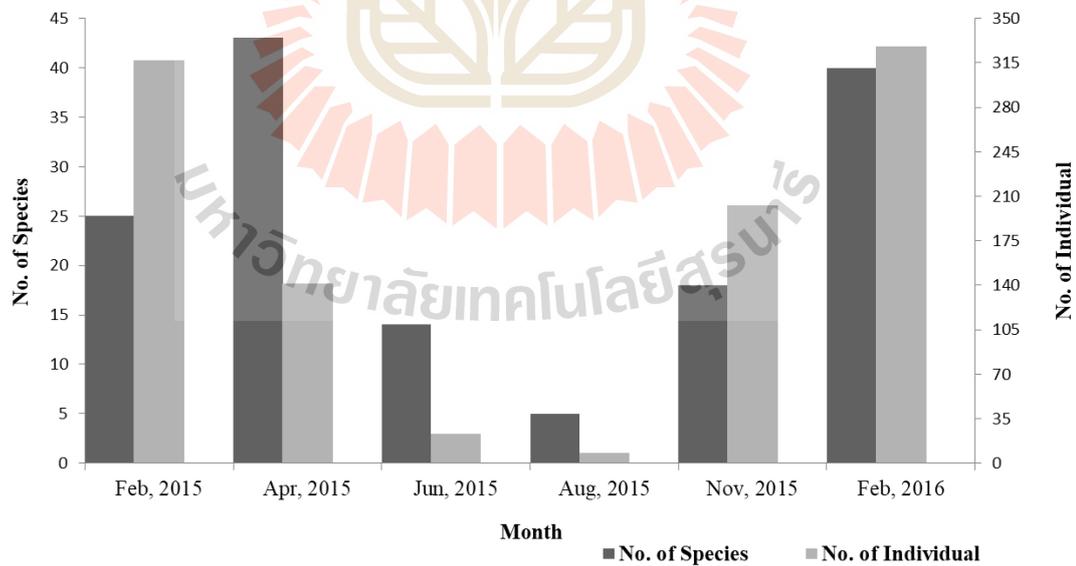


Figure 3.7 Number of species and individuals of bird in each month periods.

Table 3.1 Species diversity of bird trade in eight local markets, central Lao PDR.

No	Common Name	Scientific Name	Status				Local Market								Total Ind
			IUCN	Cites	Laos	PS	LM1	LM2	LM3	LM4	LM5	LM6	LM7	LM8	
1	Ashy Drongo	<i>Dicrurus leucophaeus</i>	LC		II	R	1	0	0	0	0	0	0	0	1
2	Asian Barred Owlet	<i>Glaucidium cuculoides</i>	LC		II	R	0	0	0	0	1	0	0	0	1
3	Asian Fairy Bluebird	<i>Irena puella</i>	LC			R	0	0	2	0	0	0	0	0	2
4	Banded Kingfisher	<i>Lacedo pulchella</i>	LC			R	3	1	0	0	0	0	0	0	4
5	Barred Buttonquail	<i>Turnix suscitator</i>	LC		II	R	0	0	0	0	4	0	0	0	4
6	Barred Cuckoo-dove	<i>Macropygia unchall</i>	LC			R	0	0	0	0	0	0	1	0	1
7	Bay Woodpecker	<i>Blythipicus pyrrhotis</i>	LC		II	R	0	0	1	0	0	0	0	0	1
8	Besra	<i>Accipiter virgatus</i>	LC			R	1	0	0	0	0	0	0	0	1
9	Black Bittern	<i>Ixobrychus flavicollis</i>	LC			WV	0	0	1	0	0	0	0	0	1
10	Black Bulbul	<i>Hypsipetes leucocephalus</i>	LC			R	0	0	8	0	0	0	0	0	8
11	Black Drongo	<i>Dicrurus macrocerus</i>	LC		II	R	2	0	3	0	0	0	0	0	5
12	Black-crested bulbul	<i>Pycnonotus flaviventris</i>	LC			R	23	12	141	3	0	0	4	0	183
13	Black-headed bulbul	<i>Pycnonotus atriceps</i>	LC			R	15	0	8	0	0	0	0	0	23
14	Black-naped monarch	<i>Hypothymis azurea</i>	LC			R	1	0	0	0	0	0	0	0	1
15	Black-naped oriole	<i>Oriolus chinensis</i>	LC			WV	0	1	0	0	0	0	0	0	1
16	Blue pitta	<i>Pitta cyanea</i>	LC		II	R	1	0	0	0	0	0	0	0	1
17	Blue-rock-thrush	<i>Monticola solitarius</i>	LC			WV	1	0	0	0	0	0	0	0	1
18	Blue-whistling-thrush	<i>Myophonus caeruleus</i>	LC			R	3	0	0	0	0	0	0	0	3
19	Blue-winged leafbird	<i>Chloropsis moluccensis</i>	LC			R	0	3	2	0	0	0	0	0	5
20	Chestnut-winged cuckoo	<i>Clamator coromandus</i>	LC			WV	1	0	0	0	0	0	0	0	1
21	Chinese pond heron	<i>Ardeola bacchus</i>	LC			M	1	0	4	0	0	0	0	0	5
22	Cinnamon bittern	<i>Ixobrychus cinnamomeus</i>	LC			WV	0	0	1	0	0	0	0	0	1
23	Collared owlet	<i>Glaucidium brodiei</i>	LC		II	R	0	1	2	0	0	0	0	0	3
24	Collared scops-owl	<i>Otus lettia</i>	LC		II	R	0	0	4	0	0	0	1	0	5
25	Common hill myna	<i>Gracula religiosa</i>	LC	II	II	R	0	0	5	0	0	0	0	0	5

Table 3.1 Species diversity of bird trade in eight local markets, central Lao PDR (Continued).

No	Common Name	Scientific Name	Status				Local Market								Total Ind
			IUCN	Cites	Laos	PS	LM1	LM2	LM3	LM4	LM5	LM6	LM7	LM8	
26	Common moorhen	<i>Gallinula chloropus</i>	LC			WV	0	0	3	0	0	0	0	0	3
27	Common myna	<i>Acridotheres tristis</i>	LC		II	R	1	0	0	0	0	0	0	0	1
28	Eastern spotted dove	<i>Spilopelia chinensis</i>	LC		II	R	72	1	8	0	0	0	0	0	81
29	Greater coucal	<i>Centropus sinensis</i>	LC		I	R	1	1	1	0	0	0	0	3	
30	Greater racquet-tailed drongo	<i>Dicrurus paradiseus</i>	LC		II	R	1	0	7	0	0	1	0	9	
31	Greater yellownape	<i>Chrysophlegma flavinucha</i>	LC		II	R	0	0	2	0	0	0	0	2	
32	Green-backed heron	<i>Butorides striata</i>	LC			WV	0	0	1	0	0	0	0	1	
33	Green-billed malkoha	<i>Phaenicophaeus tristis</i>	LC			R	0	0	1	0	0	0	0	1	
34	Green-eared barbet	<i>Psilopogon faiostriatus</i>	LC			R	0	2	13	0	0	1	0	16	
35	Grey-capped emerald dove	<i>Chalcophaps indica</i>	LC			R	21	0	3	0	0	0	0	24	
36	Grey-eyed bulbul	<i>Iole propinqua</i>	LC			R	1	0	42	0	0	0	0	43	
37	Grey-headed canary-flycatcher	<i>Culicicapa ceylonensis</i>	LC			R	4	0	0	0	0	0	0	4	
38	Hainan blue flycatcher	<i>Cyornis hainanus</i>	LC			WV	3	0	2	0	0	0	0	5	
39	Hair-crested drongo	<i>Dicrurus hottentottus</i>	LC		II	R	0	0	2	0	0	0	0	2	
40	Hill blue flycatcher	<i>Cyornis banyumas</i>	LC			R	2	0	0	0	0	0	0	2	
41	Indian roller	<i>Coracias benghalensis</i>	LC			R	1	0	0	0	0	0	0	1	
42	Japanese sparrowhawk	<i>Accipiter gularis</i>	LC			M	0	0	0	0	0	1	0	1	
43	Japanese thrush	<i>Turdus cardis</i>	LC			WV	0	0	1	0	0	0	0	1	
44	Laced woodpecker	<i>Picus vittatus</i>	LC		II	R	0	0	1	0	0	0	0	1	
45	Large scimitar-babbler	<i>Pomatorhinus hypoleucos</i>	LC			R	1	0	0	0	0	0	0	1	
46	Lesser whistling-duck	<i>Dendrocygna javanica</i>	LC			R	0	0	1	0	0	0	0	1	
47	Lineated barbet	<i>Psilopogon lineatus</i>	LC			R	0	1	0	0	0	0	0	1	
48	Little egret	<i>Egretta garzetta</i>	LC		II	R	0	1	0	0	0	0	0	1	
49	Little spiderhunter	<i>Arachnothera longirostra</i>	LC			R	0	1	0	0	0	0	0	1	
50	Long-tailed broadbill	<i>Psarisomus dalhousiae</i>	LC			R	1	0	0	0	0	0	0	1	

Table 3.1 Species diversity of bird trade in eight local markets, central Lao PDR (Continued).

No	Common Name	Scientific Name	Status				Local Market								Total Ind
			IUCN	Cites	Laos	PS	LM1	LM2	LM3	LM4	LM5	LM6	LM7	LM8	
51	Mousched barbet	<i>Psilopogon incognitus</i>	LC			R	0	0	15	0	0	0	0	0	15
52	Orange-bellied leafbird	<i>Chloropsis hardwickii</i>	LC			R	0	0	2	0	0	0	0	0	2
53	Oriental bay-owl	<i>Phodilus badius</i>	LC		II	R	0	0	1	0	0	0	0	0	1
54	Oriental scops-owl	<i>Otus sunia</i>	LC		II	R	0	0	0	0	1	0	1	0	2
55	Oriental turtle dove	<i>Streptopelia orientalis</i>	LC			W	5	0	2	0	0	0	0	0	7
56	Pin-striped tit babbler	<i>Macronos gularis</i>	LC			R	2	0	0	0	0	0	0	0	2
57	Puff-throated babbler	<i>Pellorneum ruficeps</i>	LC			R	1	0	0	0	0	0	0	0	1
58	Puff-throated bulbul	<i>Alophoixus pallidus</i>	LC			R	0	1	5	0	0	0	0	0	6
59	Purple heron	<i>Ardea purpurea</i>	LC		II	WV	0	0	1	0	0	0	0	0	1
60	Pygmy blue flycatcher	<i>Muscicapella hodgsoni</i>	LC			R	0	0	0	2	0	0	0	0	2
61	Red runglefowl	<i>Gallus gallus</i>	LC		III	R	44	2	34	0	5	0	0	0	85
63	Rufous-fronted babbler	<i>Stachyris rufifrons</i>	LC			R	1	0	4	0	0	0	0	0	5
64	Rufous-winged buzzard	<i>Butastur liventer</i>	LC			R	1	0	0	0	0	0	0	0	1
65	Scaly-breasted munia	<i>Lonchura punctulata</i>	LC			R	2	0	0	0	0	0	8	0	10
66	Scaly-breasted partridge	<i>Arborophila chloropus</i>	LC			R	0	0	0	0	2	0	0	0	2
67	Siamese fireback	<i>Lophura diardi</i>	LC		I	R	1	0	5	0	0	0	0	0	6
68	Siberian blue robin	<i>Cyornis cyane</i>	LC			WV	1	0	0	0	0	0	0	0	1
69	Siberian rubythroat	<i>Luscinia calliope</i>	LC			WV	1	0	0	0	0	0	0	0	1
70	Silver pheasant	<i>Lophura nychemera</i>	LC		I	R	1	0	5	0	0	3	1	0	10
71	Slaty-backed flycatcher	<i>Ficedula hodgsonii</i>	LC			WV	4	0	0	0	0	0	0	0	4
72	Spotted owlet	<i>Athene brama</i>	LC		II	R	0	0	2	0	0	0	0	0	2
73	Streak-eared bulbul	<i>Pycnonotus blanfordi</i>	LC			R	0	0	3	0	0	0	0	0	3
74	Stripe-throated bulbul	<i>Pycnonotus finlaysoni</i>	LC			R	9	13	9	4	0	0	0	0	35
75	Thick-billed green-pigeon	<i>Treron curvirostra</i>	LC		II	R	12	0	2	0	0	0	0	0	14
76	Verditer flycatcher	<i>Eumyias thalassinus</i>	LC			R	0	0	0	1	0	0	0	0	1

Table 3.1 Species diversity of bird trade in eight local markets, central Lao PDR (Continued).

No	Common Name	Scientific Name	Status				Local Market								Total Ind
			IUCN	Cites	Laos	PS	LM1	LM2	LM3	LM4	LM5	LM6	LM7	LM8	
77	Vernal hanging parrot	<i>Loriculus vernalis</i>	LC			R	0	0	2	0	0	0	0	0	2
78	White-breasted waterhen	<i>Amaurornis phoenicurus</i>	LC	III		R	0	0	0	0	1	0	0	1	
79	White-browed scimitar-babbler	<i>Pomatorhinus schisticeps</i>	LC			R	2	0	0	0	0	0	0	2	
80	White-crested laughingthrush	<i>Garrulax leucolophus</i>	LC			R	0	0	1	0	0	0	0	1	
81	White-rumped shama	<i>Copsychus malabaricus</i>	LC			R	1	0	4	0	0	0	0	5	
82	White-throated rock-thrush	<i>Monticola gularis</i>	LC			WV	0	0	0	1	0	0	0	1	
83	Yellow-legged buttonquail	<i>Turnix tanki</i>	LC			R	0	0	0	0	2	0	0	2	
84	Yellow-rumped flycatcher	<i>Ficedula zanthopygia</i>	LC			M	0	0	1	0	0	0	0	1	
85	Yellow-vented green-pigeon	<i>Treron seimundi</i>	LC	II		R	0	0	6	0	0	0	3	9	
Total Individuals													718		

LM1: Chout Song Local Market, LM2: Chout Neouang Local Market, LM3: Kok Local Market, LM4: Phoutthavong Local

Market, LM5: Lak Sao Local Market, LM6: Thong Pei Local Market, LM7: Khounkham Local market, LM8: Na Pei Local

Market; R: Resident; WV: Winter Visitor; M: Migration; PS: Predicted Seasonality; Total Ind: Total Individual

(Duckworth et al., 1999).

Table 3.2 The differences in their value of each bird species in each local market of Bolikhamxay and Khammouane provinces in eight local markets, central Lao PDR.

No	Common Name	LM1		LM2		LM3		LM4		LM5		LM6		LM7		LM8		Total	
		n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Min - Max
1	Ashy drongo	1	1.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
2	Asian barred owlet	-	-	-	-	-	-	-	1	1.84	-	-	-	-	-	-	-	1	1.84 - 1.84
3	Asian fairy bluebird	-	-	-	-	2	1.23 ± 0.00	-	-	-	-	-	-	-	-	-	-	2	1.23 - 1.23
4	Banded kingfisher	3	2.86 ± 2.83	1	6.13 ± 0.00	-	-	-	-	-	-	-	-	-	-	-	-	4	1.23 - 6.13
5	Barred buttonquail	-	-	-	-	-	-	-	4	1.23 ± 0.00	-	-	-	-	-	-	-	4	1.23 - 1.23
6	Barred cuckoo-dove	-	-	-	-	-	-	-	-	-	-	-	1	2.45	-	-	-	1	2.45 - 2.45
7	Bay woodpecker	-	-	-	-	1	1.23	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
8	Besra	1	2.45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2.45 - 2.45
9	Black bittern	-	-	-	-	1	1.84	-	-	-	-	-	-	-	-	-	-	1	1.84 - 1.84
10	Black drongo	2	1.23 ± 0.00	-	-	3	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	5	0.61 - 1.23
11	Black-crested bulbul	23	1.44 ± 0.47	12	1.18 ± 0.18	141	0.65 ± 0.14	3	0.61 ± 0.00	-	-	-	4	0.61 ± 0.00	-	-	-	183	0.61 - 6.13
12	Black-headed bulbul	15	1.16 ± 0.25	-	-	8	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	23	0.25 - 1.23
13	Black-naped monarch	1	1.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
14	Black-naped oriole	-	-	1	1.23	-	-	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
15	Blue pitta	1	0.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.61 - 0.61
16	Blue-roch-thrush	1	1.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
17	Blue-whistling-thrush	3	1.64 ± 0.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.23 - 2.45
18	Blue-winged leafbird	-	-	3	1.23 ± 0.00	2	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	5	0.61 - 1.23
19	Chesnut-winged cuckoo	1	0.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.61 - 0.61
20	Chinese pond heron	1	1.84	-	-	4	2.45 ± 0.00	-	-	-	-	-	-	-	-	-	-	5	1.84 - 2.45
21	Cinnamon bittern	-	-	-	-	1	2.45	-	-	-	-	-	-	-	-	-	-	1	2.45 - 2.45
22	Collared owlet	-	-	1	1.23	2	1.84 ± 0.86	-	-	-	-	-	-	-	-	-	-	3	1.23 - 2.45
23	Collared scops-owl	-	-	-	-	4	1.69 ± 0.31	-	-	-	-	-	1	1.23	-	-	-	5	1.23 - 1.84
24	Common hill myna	-	-	-	-	5	61.30 ± 0.00	-	-	-	-	-	-	-	-	-	-	5	61.30 - 61.30
25	Common moorhen	-	-	-	-	3	1.84 ± 0.61	-	-	-	-	-	-	-	-	-	-	3	1.23 - 2.45
26	Common myna	1	6.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	6.13 - 6.13
27	Eastern spotted dove	72	3.45 ± 0.47	1	2.45	8	4.22 ± 2.13	-	-	-	-	-	-	-	-	-	-	81	1.84 - 6.13
28	Greater coucal	1	3.07	1	1.23	1	1.84	-	-	-	-	-	-	-	-	-	-	3	1.23 - 3.07
29	Greater racquet-tailed drongo	1	1.23	-	-	7	1.93 ± 0.42	-	-	-	1	1.84	-	-	-	-	-	9	1.23 - 2.45
30	Greater yellowape	-	-	-	-	2	3.68 ± 0.00	-	-	-	-	-	-	-	-	-	-	2	3.68 - 3.68

Table 3.2 The differences in their value of each bird species in each local market of Bolikhamxay and Khammouane provinces in eight local markets, central Lao PDR (Continued).

No	Common Name	LM1		LM2		LM3		LM4		LM5		LM6		LM7		LM8		Total	
		n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Min - Max						
31	Green-backed heron	-	-	-	-	1	2.45	-	-	-	-	-	-	-	-	-	-	1	2.45 - 2.45
32	Green-billed malkoha	-	-	-	-	1	1.23	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
33	Green-eared barbet	-	-	2	1.84 ± 0.00	13	2.07 ± 0.31	-	-	-	-	1	1.84	-	-	-	-	16	1.84 - 2.45
34	Grey-capped emerald dove	21	3.39 ± 0.60	-	-	3	2.45 ± 1.06	-	-	-	-	-	-	-	-	-	-	24	1.84 - 3.68
35	Grey-eyed bulbul	1	1.23	-	-	42	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	43	0.61 - 1.23
36	Grey-headed canary-flycatcher	4	0.28 ± 0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0.28 - 0.28
37	Hainan blue flycatcher	3	0.28 ± 0.00	-	-	2	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	5	0.28 - 0.61
38	Hair-crested drongo	-	-	-	-	2	1.23 ± 0.00	-	-	-	-	-	-	-	-	-	-	2	1.23 - 1.23
39	Hill blue flycatcher	2	0.28 ± 0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.28 - 0.28
40	Himalayan black bulbul	-	-	-	-	8	0.84 ± 0.32	-	-	-	-	-	-	-	-	-	-	8	0.61 - 1.23
41	Indian roller	1	1.84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.84 - 1.84
42	Japanese sparrowhawk	-	-	-	-	-	-	-	-	-	-	1	1.84	-	-	-	-	1	1.84 - 1.84
43	Japanese thrush	-	-	-	-	1	0.61	-	-	-	-	-	-	-	-	-	-	1	0.61 - 0.61
44	Laced woodpecker	-	-	-	-	1	1.23	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
45	Large scimitar-babbler	1	1.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
46	Lesser whistling-duck	-	-	-	-	1	1.23	-	-	-	-	-	-	-	-	-	-	1	2.45 - 2.45
47	Lineated barbet	-	-	1	1.84	-	-	-	-	-	-	-	-	-	-	-	-	1	1.84 - 1.84
48	Little egret	-	-	1	3.68	-	-	-	-	-	-	-	-	-	-	-	-	1	3.68 - 3.68
49	Little spiderhunter	-	-	1	0.61	-	-	-	-	-	-	-	-	-	-	-	-	1	0.61 - 0.61
50	Long-tailed broadbill	1	6.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	6.13 - 6.13
51	Moustached barbet	-	-	-	-	15	1.76 ± 0.39	-	-	-	-	-	-	-	-	-	-	15	1.23 - 2.45
52	Orange-bellied leafbird	-	-	-	-	2	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	2	0.61 - 0.61
53	Oriental bay owl	-	-	-	-	1	1.84	-	-	-	-	-	-	-	-	-	-	1	1.84 - 1.84
54	Oriental scops -owl	-	-	-	-	-	-	-	-	1	1.84	-	-	1	1.23	-	-	2	1.23 - 1.84
55	Oriental turtle dove	5	2.82 ± 0.34	-	-	2	2.45 ± 0.00	-	-	-	-	-	-	-	-	-	-	7	2.45 - 3.07
56	Pin-striped tit babbler	2	0.28 ± 0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.28 - 0.28
57	Puff-throated babbler	1	0.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.28 - 0.28
58	Puff-throated bulbul	1	1.23	-	-	5	0.86 ± 0.34	-	-	-	-	-	-	-	-	-	-	6	0.61 - 1.23
59	Purple heron	-	-	-	-	1	7.97	-	-	-	-	-	-	-	-	-	-	1	7.97 - 7.97
60	Pygmy blue flycatcher	-	-	-	-	-	-	2	0.61 ± 0.00	-	-	-	-	-	-	-	-	2	0.61 - 0.61

Table 3.2 The differences in their value of each bird species in each local market of Bolikhamxay and Khammouane provinces in eight local markets, central Lao PDR (Continued).

No	Common Name	LM1		LM2		LM3		LM4		LM5		LM6		LM7		LM8		Total	
		n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Min - Max
61	Red junglefowl	44	7.65 ± 1.05	2	6.75 ± 0.87	34	6.24 ± 1.18	-	-	5	8.58 ± 1.50	-	-	-	-	-	-	85	3.68 - 9.81
62	Rufous woodpecker	-	-	1	1.23	-	-	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
63	Rufous-fronted babbler	1	0.28	-	-	4	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	5	0.28 - 0.61
64	Rufous-winged buzzard	1	2.45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2.45 - 2.45
65	Scaly-breasted munia	2	0.28 ± 0.00	-	-	-	-	-	-	-	-	-	8	0.61 ± 0.00	-	-	-	10	0.28 - 0.61
66	Scaly-breasted partridge	-	-	-	-	-	-	-	-	2	7.36 ± 0.00	-	-	-	-	-	-	2	7.36 - 7.36
67	Siamese fireback	1	9.81	-	-	5	8.82 ± 2.66	-	-	-	-	-	-	-	-	-	-	6	6.13 - 12.26
68	Siberian blue robin	1	0.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.28 - 0.28
69	Siberian rubythroat	1	0.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.28 - 0.28
70	Silver pheasant	1	8.58	-	-	5	17.16 ± 2.74	-	-	-	-	3	11.44 ± 1.41	1	12.26	-	-	10	8.58 - 18.39
71	Slaty-backed flycatcher	4	0.28 ± 0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0.28 - 0.28
72	Spotted owlet	-	-	-	-	2	1.84 ± 0.00	-	-	-	-	-	-	-	-	-	-	2	1.84 - 1.84
73	Streak-eared bulbul	-	-	-	-	3	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	3	0.61 - 0.61
74	Stripe-throated bulbul	9	1.59 ± 1.06	13	1.14 ± 0.23	9	0.75 ± 0.27	4	0.61 ± 0.00	-	-	-	-	-	-	-	-	35	0.28 - 2.45
75	Thick-billed green-pigeon	12	2.96 ± 0.63	-	-	2	2.46 ± 0.87	-	-	-	-	-	-	-	-	-	-	14	1.84 - 3.68
76	Verditer flycatcher	-	-	-	-	-	-	1	0.61	-	-	-	-	-	-	-	-	1	0.61 - 0.61
77	Vernal hanging parrot	-	-	-	-	2	0.61 ± 0.00	-	-	-	-	-	-	-	-	-	-	2	0.61 - 0.61
78	White-breasted waterhen	-	-	-	-	-	-	-	-	1	1.23	-	-	-	-	-	-	1	1.23 - 1.23
79	White-browed scimitar-babbler	2	0.28 ± 0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.28 - 0.28
80	White-crested laughingthrush	-	-	-	-	1	1.23	-	-	-	-	-	-	-	-	-	-	1	1.23 - 1.23
81	White-rumped shama	1	1.23	-	-	4	0.77 ± 0.31	-	-	-	-	-	-	-	-	-	-	5	0.61 - 1.23
82	White-throated rock-thrush	-	-	-	-	-	-	1	0.61 ± 0.00	-	-	-	-	-	-	-	-	1	0.61 - 0.61
83	Yellow-legged buttonquail	-	-	-	-	-	-	-	-	2	1.23 ± 0.00	-	-	-	-	-	-	2	1.23 - 1.23
84	Yellow-rumped flycatcher	-	-	-	-	1	0.61	-	-	-	-	-	-	-	-	-	-	1	0.61 - 0.61
85	Yellow-vented green-pigeon	-	-	-	-	6	3.07 ± 0.39	-	-	-	-	-	3	3.07 ± 0.00	-	-	-	9	2.45 - 3.68

LM1: Chout Song Local Market, LM2: Chout Neuang Local Market, LM3: Kok Local Market, LM4: Phoutthavong Local Market,

LM5: Lak Sao Local Market, LM6: Thong Pei Local Market, LM7: Khounkham Local market, LM8: Na Pei Local Market.

Table 3.3 The differences between mean in each local market, central Lao PDR.

No	Common Name	LM	LM1	LM2	LM3	LM4	LM5	LM6	LM7	P-Value
			Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	
1	Black-crested bulbul	LM1		0.26 ±0.08*	0.80±0.05*	0.83±0.13*			0.83±0.12*	<0.001
		LM2			0.53±0.06*	0.57±0.14*			0.57 ±0.12*	
		LM3				0.04±0.13			0.04±0.11	
		LM4							0.00±0.16	
2	Black-headed bulbul	LM1			0.61±0.00					<0.001
3	Eastern spotted dove	LM1			4.22±0.75					0.01
4	Grey-capped emerald dove	LM1			2.45±0.61					0.03
5	Red junglefowl	LM1			1.41 ±0.26*		0.93±0.53			<0.001
		LM3					2.34±0.54*			
6	Silver pheasant	LM3						11.44±0.82		0.03
7	Stripe-throated bulbul	LM1		0.46±0.25	0.84±0.27*	0.98 ±0.35*				0.01
		LM2			0.39±0.25	0.53±0.33				
		LM3				0.14±0.35				
8	Yellow-vented green-pigeon	LM3						3.07±0.00		0.99

* The means difference is significant at P<0.05. LM: Local Market, LM1: Chout Song Local Market, LM2: Chout Neouang Local Market, LM3: Kok Local Market, LM4: Phoutthavong Local Market, LM5: Lak Sao Local Market, LM6: Thong Pei Local Market, LM7: Khounkham Local market, LM8: Na Pei Local Market.

3.5 Discussion

The results of the present study demonstrate high species diversity and abundance of birds on trade at local markets in Lao PDR. Species of birds were traded more in dry season than in wet season. Trading bird for pets was higher price than for foods. In addition, seven species of birds were significantly different value between each local market. However, no threatened species of bird was found in the IUCN Red List during this study. These findings suggest the study of trading species of birds in local markets might be similarly to the previous studying species of birds in forest because of the natural resources are from the areas nearby (Robinson et al., 2018).

In comparison to Srikosamatara et al. (1992), it can be seen that this study found more species than the previous study (85; 33 species), more families (30; 17), but fewer orders (13; 14) due to this study observed bird trade from more local markets and the local markets were situated near the five of National Biodiversity Conservation Areas and five Important Bird and Biodiversity Areas (Ounekham and Inthapatha, 2003), and these National Biodiversity Conservation Areas are known the hotspot for birds in Lao PDR (Tobias et al., 1998; Ounekham and Inthapatha, 2003; Strange, 2013). Moreover, this two studies got similar finding, such as 7 orders (Pelecaniformes, Passeriformes, Cuculiformes, Anseriformes, Galliformes, Columbiformes, Gruiformes), 8 families (Ardeidae, Irenidae, Dicruridae, Cuculidae, Anatidae, Phasianidae, Columbidae, Rallidae), and 10 species (Chinese pond heron, Asian fairy bluebird (*Irena puella*), ashy drongo, greater coucal, lesser whistling-duck (*Dendrocygna javanica*), silver pheasant, red junglefowl, thick-billed green-pigeon, eastern spotted dove and white-breasted waterhen). The present study also supported Jenkins et al. (2005) who suggested that routine survey and observation of local

markets in Lao PDR provided an overview information of exploitation of animals occurring in the surrounding areas and occasionally provide interesting species records. Previously, Laotian rock rat (*Laonastes aenigmamus*) (Jenkins et al., 2005) and Laotian giant flying squirrel (*Biswamoyopterus laoensis*) (Sanamxay et al., 2013) which were firstly discovered as bush-meat in local markets in central Lao PDR; Chinese sparrowhawk (*Accipiter soloensis*; Evans and Timmins, 1998), blanford's fruit bat (*Sphaerias blanfordi*; Douangboubpha et al., 2012) and red giant flying squirrel (*Petaurista petaurista*; Sanamxay et al., 2015) which were firstly recorded for the country as bush-meat in local markets. If more observations were conducted, it is expected that more species diversity of birds would be found in the local markets.

Black-crested bulbul and eastern spotted dove were traded as the highest number among other species. This probably due to these two species are common widespread distribution and are inhabited in wide range of habitat (Robson, 2008) which might be easy to hunt by local hunters. In addition, red junglefowl was found the second high trading number comparing to both species above and this study finding confirmed that this species still be the demand of the customer in the rural markets as it was found by Duckworth et al. (1999) and Srikosamatara et al. (1992). However, another species were found lower number than the three species above due to they are rare in the areas, and they were not the demand of customers. They are global widespread distribution and several species are winter visitor of birds in the areas (Robson, 2008). Species and abundance of birds were found high trading at Kok and Chout Song local markets due to these two markets located nearby to the National Biodiversity Conservation Areas. According to behavior of local hunters, the common

species were hunted in the areas nearby. In addition, these two markets located beside the main roads which are frequently point of street markets.

According to previous studies, nine species of birds were found in some local markets such as Lak Sao local market (Tizard, 1996; Timmins and Evans, 1996; Thewlis et al., 1998; Evans and Timmins, 1998), but they were not found during this study. Three species were traded at Thong Pei local market (Timmins and Evans, 1996; Tizard, 1996), however, only one species was found in the present study. In addition, this study could not find any species of bird as it was found one species in Na Pei local market (Thewlis et al., 1998). This can be explained that several species of birds are rare from local area because they were mainly hunted from previous studies (WCS, 1995a; Timmins and Evans, 1996; Timmins and Evans, 1996).

Both numbers of species and individuals of bird trade were found high in dry season (November-May) and low in wet season (June-October), because wet season is rice farming period and it is difficult to go hunting. In addition, this period is Buddhist lent and few local people hunted animal in this period due to their belief (Srikosamatara et al., 1992). In contrast, in dry season it is easier to hunt wildlife because local villagers are free from farming and their second jobs are collecting natural products, and it is easier to trap animals in small river ponds near the forest.

In this study found that the price of bird trade is based on the size, rare species, alive or dead, beauty and song birds. Birds with large size were sold in high price due to those birds were bought for luxury food. Srikosamatara et al. (1992) suggested that the price of wildlife meat is three times higher than that of the domestic animals. However, some small size species such as common hill myna but were sold in high price (US\$ 61.30 per bird), because it is bought to be pet and song bird. Alive

and dead birds were sold differently in price due to alive birds were bought to be pets and merit release. Gilbert et al. (2012) observed 57 species of birds were traded for merit release in Phnom Penh, Cambodia. Among these, five species (eastern spotted dove, common hill myna, barred buttonquail, scaly-breasted munia, black drongo) found the same in this study. However, the prices in different local markets were found significant differently.

Previously, two species including crested argus and red-collared woodpecker (*Picus rabieri*) were classified as Globally Near Threatened (IUCN, 2017) and found as 'bush-meat' in local markets (Timmins and Evans, 1996; Tizard, 1996; Thewlis et al., 1998). In the recent year, the Laotian law for wildlife trade and hunting appeared to be contradictory. According to this study, no any of bird found in trading was classified as global threatened species (IUCN, 2017). Only one species was classified in Appendix II in CITES (CITES, 2017) but 28 species were classified in Lao Wildlife and Aquatic Law (The Forestry Division, 2009). However, the current wildlife hunting and trading were done probably based on the necessity of local minorities in the rural areas, and it is difficult to enforce very sensitive ethnic people to follow the regulations and the wildlife law (Srikosamatara et al., 1992).

In conclusion, this study was the first time routine surveyed of bird trade in local markets of Bolikhamxay and Khammouane provinces, central Lao PDR. It clearly demonstrates high species diversity and abundance of birds trading in this area. The results of this study can be used as the baseline information for controlling the hunting and trading the wildlife, especially the bird species in orders to conserve as well as manage the wildlife in Lao PDR. In order to get more detail changing data, further studies should observe wildlife trade every month in the whole year.

3.6 References

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CHAPTER IV

CHECKLIST OF BIRDS IN CENTRAL LAO PDR, WITH DISTRIBUTION OF BIRD SPECIES FOUND IN THE LOCAL MARKETS

4.1 Abstract

This chapter provides the first comprehensive review of bird species in central Lao PDR and detailed documentation of information on the distribution of 85 species of bird observed in local markets in the area. Information was gathered for literature records. Detailed distribution was mapped for 85 observed species. Based on literature, 478 species of birds belong to 19 orders and 77 families were reported from central Lao PDR. This includes 3 Endangered species, 9 Vulnerable species and 17 Near Threatened species. The highest number of birds was found in Nakai-Nam Theun National Biodiversity Conservation Area (410 species) where is global Important Bird and Biodiversity Area in Lao PDR. The distribution maps of 85 observed species show that most of them were documented from surrounding areas. This review also supported the number of bird trading in local markets in central Lao PDR. This review should be higher than current observation and also supported the idea of bird trading in local markets may hunted from their surrounding areas.

4.2 Introduction

Lao People's Democratic Republic (Lao PDR) has high bird diversity which includes more than 700 species reported for the country (Duckworth et al., 1999). In addition, Lao PDR consists of 24 National Biodiversity Conservation Areas (NBCAs; known as National Protected Areas; NPAs) (Environment Protection Fund Lao PDR, 2014) and 27 Important Bird and Biodiversity Areas (IBAs) (Ounekham and Inthapatha, 2003).

Central Lao PDR consists of five NBCAs (including Nam Kading, Phou Hin Poun (known as Khammouane Limestone), Nakai-Nam Theun, Hin Namno and Phou Xang He), two Biodiversity Conservation Corridors (BCCs) (including Northern Extension (known as Nam Theun Extension) and Nakai Plateau) and five IBAs (including Nam Chat/Nam Pan, Nakai Plateau, Nakai-Nam Theun, Central Khammouane Limestone and Hin Namno). Between 1994 to 1999, several bird surveys were conducted in the area (WCS, 1995a; Timmins and Evans, 1996; Timmins and Khounbolin, 1996; Tizard, 1996; Timmins, 1997; Walston and Vinton 1999) with a few results of the surveys were published (Thewlis et al., 1995; Tobias, 1997; Duckworth et al., 1998; Evans and Timmins, 1998). In addition, some new species were recently reported and discovered in the area but based on the results of the surveys in 1994-1999 (Woxvold et al., 2009; Duckworth, 2009; Alstrom et al., 2010). The highest bird species, in comparison to other parts of the country, were also recorded from this area, especially in Nakai-Nam Theun NBCA which is also the highest birds recorded in a single protected area in Southeast Asia and is also a significant area for biodiversity of Lao PDR (Tobias et al., 1998; WCS, 1995b; Singh, 2008). It was found that several species of birds were found for trading in several

markets in the area, especially in Lak Sao and Nakai (Tizard, 1996; Timmins and Evans 1996; Evans and Timmins, 1998; Thewlis et al., 1998; Robichaud, 2002). Jenkins et al. (2005) suggested that routine survey and observation of local markets in Lao PDR provided an overview information of exploitation of animals occurring in the surrounding areas and occasionally provided interesting species records.

This chapter aims to check the list of bird species previously recorded in the central Lao PDR and mapped distribution of 85 species of birds previously recorded from 8 local markets in the area (see Chapter III) to predict possibility of their origin.

4.3 Materials and Methods

Number of bird species previously found in the central Lao PDR, especially in five NBCAs and two BCCs were gathered from publications (Thewlis et al., 1995; Tobias, 1997; Duckworth et al., 1998; Evans and Timmins, 1998; Duckworth, 2009; Alstrom et al., 2010; Coudrat and Nanthavong, 2016) and unpublished sources (WCS, 1995a; Timmins and Evans, 1996; Timmins and Khounboline, 1996; Tizard, 1996; Timmins, 1997; Walston and Vinton, 1999) (Appendix B). The distribution data of 85 bird species previously observed from local markets in central Lao PDR were also gathered from the same sources as above.

The species richness map of birds found in central Lao PDR including bird species observed from local markets and distribution maps of 85 bird species were generated using the software ArcGIS version 10.1 for window (ESRI Inc.). The thematic layer of NBCAs and BCCs is based on layer downloaded from the Protected Planet (www.protectedplanet.net).

The taxonomy and nomenclature of birds in the Chapter were followed the BirdLife International (2017). Conservation status of birds found in the central Lao PDR was listed following the International Union for Conservation of Nature (IUCN) Red Lists of Threatened Species (IUCN, 2017).

4.4 Results

Total 478 species of birds of 19 orders and 77 families were reported from the central Lao PDR (Table 4.1). The highest species richness of birds were found in Nakai-Nam Theun NBCA and Nakai Plateau, 410 and 299 species, respectively and the lowest number was in Phou Hin Poun, 135 species (Figure 4.1).

Almost species of birds reported from the central Lao PDR were classified as 'Least Concern (LC)' in the IUCN Red Lists of Threatened Species (IUCN, 2017). However, 3 species were classified as 'Endangered (EN)' including green peafowl (*Pavo muticus*), white-winged duck (*Asarcornis scutulata*), yellow-breasted bunting (*Emberiza aureola*), and 9 species were classified as 'Vulnerable (VU)' namely great slaty woodpecker (*Mulleripicus pulverulentus*), rufous-necked hornbill (*Aceros nipalensis*), pale-capped pigeon (*Columba punicea*), wood snipe (*Gallinago nemoricola*), greater spotted eagle (*Clanga clanga*), fairy pitta (*Pitta nympha*), grey-sided thrush (*Turdus feae*), beautiful nuthatch (*Sitta Formosa*), wire-tailed swallow (*Hirundo smithii*). In addition, 17 species were listed as 'Near Threatened (NT)' namely crested argus (*Rheinardia ocellata*), red-collared woodpecker (*Picus rabieri*), great hornbill (*Buceros bicornis*), Tickell's brown hornbill (*Anorrhinus tickelli*), blyth's kingfisher (*Alcedo Hercules*), grey-headed parakeet (*Psittacula finschii*), red-breasted parakeet (*P. alexandri*), Kittlitz's murrelet (*Brachyramphus*

brevirostris), river lapwing (*Vanellus duvaucelii*), lesser fish-eagle (*Ichthyophaga humilis*), grey-headed fish-eagle (*I. ichthyaetus*), oriental darter (*Anhinga melanogaster*), spot-billed pelican (*Pelecanus philippensis*), Javan broadbill (*Eurylaimus javanicus*), white-winged magpie (*Urocissa whiteheadi*), Japanese paradise-flycatcher (*Terpsiphone atrocaudata*), and short-tailed scimitar-babbler (*Jabouilleia danjoui*) (Figure 4.2).

Systematic Section

Order Galliformes

Family Phasianidae

Arborophila chloropus Blyth, 1859

Scaly-breasted partridge

Distribution

Central Lao PDR: Bolikhamxay province: Lak Sao local market (this study), scrubs and inundation area, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); central forest area and southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Khammouane Limestone, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Pan and Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai; Ban Nakadok forest; middle Nam Xot; southern mountains; western plateau forest and western plateau all habitat, Nakai-Nam Theun NBCA (Timmins and Evans, 1996), Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997;

Evans and Timmins, 1998); north Houay Clocc and north degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); north; central and southeast, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho; Phou Xang He; mixed deciduous forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.3).

Gallus gallus Linnaeus, 1758

Red junglefowl

Distribution

Central Lao PDR: Bolikhamxay province: Lak Sao local market and Khammouane province: Chout Song, Chout Neouang, Kok local markets (this study), Nam Kading NBCA forest, inundation area, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995a); Nakai-Nam Theun NBCA, Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Nam Chat, Northern Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper Nam Gnouang/lower Nam Heun, middle Nam Heun/lower Nam Cham, upper nam Cham valley, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north, central, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.4).

Lophura nycthemera Linnaeus, 1758

Silver pheasant

Distribution

Central Lao PDR: Bolikhamxay province: Lak Sao local market and Khammoune province: Chout Song, Chout Neouang, Kok local markets (this study), Nam Kading NBCA forest, Nam Ao forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, central mountains over, cypress forest, Phou Laoko, southern mountains, western plateau forest, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, middle Nam Heun/Lower Nam Cham, upper Nam Cham valley, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998), Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998), Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); north Houay Clocc, Hin Namno NBCA (Timmins and Khounbolin, 1996), north, west, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.5).

Lophura diardi Bonaparte, 1856

Siamese fireback

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nam

Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995a); Ban Nakadok forest, western plateau forest, western plateau degraded habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.6).

Order Anseriformes

Family Anatidae

Dendrocygna javanica Horsfield, 1821

Lesser whistling-duck

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), western plateau degraded habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998); central, Hin Namno NBCA (Walstona and Vinton, 1999) (Figure 4.7).

Order Cuculiformes

Family Cuculidae

Clamator coromandus Linnaeus, 1766

Chestnut-winged cuckoo

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Kading NBCA river, inundation area, scrubs, Nam Kading NBCA (WCS, 1995a); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); middle Nam Xot, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); upper Nam Gnouang/lower Nam Heun, Nakai Nam-Theun NBCA (Tizard, 1996), Nakai-Nam Theun NBCA, Naka-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.8).

Phaenicophaeus tristis Lesson, 1830

Green-billed malkoha

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), western plateau forest, western plateau degraded habitat, western plateau all habitat, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau,

Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.9).

Centropus sinensis Stephens, 1815

Greater coucal

Distribution

Central Lao PDR: Khammouane province: Chout Song, Chout Neouang and Kok local markets (this study), Nam Kading NBCA forest, Nam Ao forest, Nam Kading NBCA (WCS, 1995a); Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, central mountains over, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); central, west, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.10).

Order Piciformes

Family Picidae

Micropternus brachyurus Vieillot, 1818

Rufous woodpecker

Distribution

Central Lao PDR: Khammouane province: Chout Neouang local market (this study), Nam Xot, Nakai-Nam Theun NBCA (Tobias, 1997); cypress forest, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998) (Figure 4.11).

Chrysophegma flavinucha Gould, 1834

Greater yellownape

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Khammouane Limestone, Phou Hin Poun NBCA (WCS, 1995a; Duckworth et al., 1998); central forest area, Phou Hin Poun NBCA (Timmins 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, middle Nam Xot, central mountains over, cypress forest, southern mountains, western plateau forest, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997);

Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.12).

Picus vittatus Vieillot, 1818

Laced woodpecker

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Ao forest, Nam Kading below NBCA, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); central forest area, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Xot, Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, central mountains over, western plateau forest, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996), wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north Houay Talee, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno

NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.13).

Blythipicus pyrrhotis Hodgson, 1837

Bay woodpecker

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Ao forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Northern Extension (Tobias, 1997); southern mountains, western plateau forest, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998); Phou Hinho, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.14).

Family Megalaimidae

Psilopogon lineata Vieillot, 1816

Lineated barbet

Distribution

Central Lao PDR: Khammouane province: Chout Neouang local market (this study), Nam Kading NBCA forest, Nam Ao forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al.,

1998); central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Nam Xot, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, central mountains over, cypress forest, Phou Laoko, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north Houay Talee, Hin Namno NBCA (Timmins and Khounboline, 1996); central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.15).

Psilopogon faiostriata Temminck, 1831

Green-eared barbet

Distribution

Central Lao PDR: Khammouane province: Chout Neouang and Kok local markets; Bolikhamxay province: Thong Pei local market (this study), scrub, Nam Kading NBCA (WCS, 1995a); northern enclave, southern habitat link, Pou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai-

Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.16).

Psilopogon incognita Hume, 1874

Moustached barbet

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); north Houay Clocc, Hin Namno NBCA (Timmins and Khounboline, 1996); upper Nam Cham valley, Phou Xang He NBCA (Tizard, 1996) (Figure 4.17).

Order Coraciiformes

Family Coraciidae

Coracias benghalensis Linnaeus, 1758

Indian roller

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Ao forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Nam Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995a); Ban Vangdao, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Phou Hin Poun

NBCA Duckworth et al., 1998); Khammouane Limestone, Phou Hin Poun NBCA (Timmins, 1997; Duckworth et al., 1998). Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, middle Nam Xot, central mountains over, cypress forest, southern mountains, western plateau forest, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, middle Nam Heun/lower Nam Cham, upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north Houay Talee, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.18).

Family Alcedinidae

Lacedo pulchella Linnaeus, 1758

Banded kingfisher

Distribution

Central Lao PDR: Khammouane province: Chout Song, Chout Neouang local markets (this study), Nam Ao forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Phou Hinho, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.19).

Order Psittaciformes

Family Psittacidae

Loriculus vernalis Sparrman, 1787

Vernal hanging-parrot

Distribution

Central Lao PDR: Khammoane province: Kok local market (this study), western plateau forest, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.20).

Order Strigiformes

Family Tytonidae

Phodilus badius Horsfield, 1821

Oriental bay-owl

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Nam Chat, Northern Extension (Tobias, 1997); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou

Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.21).

Family Strigidae

Otus sunia Hodgson, 1836

Oriental scops-owl

Distribution

Central Lao PDR: Khammoaune province: Khounkham local markets; Bolikhamxay province: Lak Sao local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995a) (Figure 4.22).

Otus lettia Hodgson, 1836

Collared scops-owl

Distribution

Central Lao PDR: Khammouane province: Kok and Khounkham local markets (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998) (Figure 4.23).

Glaucidium brodiei Burton, 1836

Collared owlet

Distribution

Central Lao PDR: Khammouane province: Chout Neouang, Kok local markets (this study), Nam Kading NBCA forest, Nam Ao forest, scrubs, Nam Kading NBCA

(WCS, 1995a); central forest area, Phou Hin Poun NBCA (Timmins, 1997); Nakai-Nam Theun NBCA, Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Nam Chat, Northern Extension (Tobias, 1997); western plateau forest, western plateau degraded habitat, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); north, central, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.24).

Glaucidium cuculoides Vigors, 1831

Asian barred owlet

Distribution

Central Lao PDR: Bolikhamxay province: Lak Sao local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Chat, Nam Pan, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, middle Nam Xot, central mountains over, cypress forest, southern mountains, western plateau forest, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias,

1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.25).

Athene brama Xantus De Vesey, 1860

Spotted owlet

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrubs, Nam Kading NBCA (WCS, 1995a); central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, central mountains over, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, middle Nam Heun/lower Nam Cham, upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry

dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.26).

Order Columbiformes

Family Columbidae

Streptopelia orientalis Latham, 1790

Oriental turtle-dove

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nam Kading NBCA forest, inundation area, Nam Kading NBCA (WCS, 1995a); Nam Mon, Nakai Nam-Then NBCA (Tobias, 1997); Ban Nakadok degraded, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, Nakai Nam-Then NBCA (Timmins and Evans, 1996); Nakai-Nam Theun NBCA, Nakai Nam-Then NBCA (Tobias, 1997; Evans and Timmins, 1998), Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, dry dipterocarp forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.27).

Spilopelia chinensis Scopoli, 1786

Eastern spotted dove

Distribution

Central Lao PDR: Khammouane province: Chout Song, Chout Neouang and Kok local markets (this study), scrub, Nam Kading NBCA (WCS, 1995a); Nam Mon,

Nakai Nam-Thuen NBCA (Tobias, 1997); Northern Extension, Northern Extension (Tobias, 1997); Ban Nakadok degraded, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, Nakai Nam-Thuen NBCA (Timmins and Evans, 1996); upper Nam Gnouang/lower Nam Heun, middle Nam Heun/Lower Nam Cham, Nakai Nam-Thuen NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.28).

Macropygia unchall Wagler, 1827

Barred cuckoo-dove

Distribution

Central Lao PDR: Khammouane province: Khounkham local market (this study), Nam Kading NBCA river, inundation area, Nadee limestone, Nam Kading below NBCA, Nam Kading NBCA (WCS, 1995a); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); Ban Nakadok degraded, southern mountains, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996), upper Nam Gnouang/lower Nam Heun, middle Nam Heun/lower Nam Cham, upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin

Namno NBCA (Walston and Vinton, 1999); Phou Hinho, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.29).

Chalcophaps indica Linnaeus, 1758

Grey-capped emerald dove

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok degraded, middle Nam Xot, central mountains over, cypress forest, western plateau forest, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Northern Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); north Houay Clocc, Hin Namno NBCA (Timmins and Khounboline, 1996); central, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.30).

Treron curvirostra Gmelin, 1789

Thick-billed green pigeon

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nakai Plateau, Nakai Plateau (Duckworth et al., (1998) (Figure 4.31).

Treron seimundi Robinson, 1910

Yellow-vented green-pigeon

Distribution

Central Lao PDR: Khammouane province: Kok and Khounkham local markets (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); southern mountains, western plateau forest, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai-Nam Theun NBCA, Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998), Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.32).

Order Gruiformes

Family Rallidae

Amaurornis phoenicurus Pennant, 1769

White-breasted waterhen

Distribution

Central Lao PDR: Bolikhamxay province: Lak Sao local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrubs, Nam Kading NBCA (WCS,

1995a); Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, central mountains over, cypress forest, southern mountains, western plateau forest, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Northern Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); Phou Hinho, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.33).

Gallinula chloropus Linnaeus, 1758

Common moorhen

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Kading NBCA river, inundation area, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); western plateau forest, western plateau degraded habitat, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); south degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); north, Hin Namno NBCA (Walston and Vinton,

1999); Phou Xang He, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.34).

Order Charadriiformes

Family Turnicidae

Turnix tanki Blyth, 1843

Yellow-legged buttonquail

Distribution

Central Lao PDR: Bolikhamxay province: Lak Sao local market (this study), scrub, Nam Kading NBCA (WCS, 1995b); Nakai-Nam Theun NBCA, Nakai Nam-Theun BCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); western plateau degraded habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998); south degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); central, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.35).

Turnix suscitator Gmelin, 1789

Barred buttonquail

Distribution

Central Lao PDR: Bolikhamxay province: Lak Sao local market (this study) (Figure 4.36).

Order Accipitriformes

Family Accipitridae

Accipiter gularis Temminck & Schlegel, 1844

Japanese sparrowhawk

Distribution

Central Lao PDR: Bolikhamxay province: Thong Pei (this study), scrub, Nam Kading NBCA (WCS, 1995b); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997) (Figure 4.37).

Accipiter virgatus Temminck, 1822

Besra

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nakai-Nam Theun NBCA, Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996) (Figure 4.38).

Butastur liventer Temminck, 1827

Rufous-winged buzzard

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998); Nam Theun

Extension, Nam Theun Extension (Evans and Timmins, 1998); north, Hin Namno NBCA (Walston and Vinton, 1999); dry dipterocarp forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.39).

Order Pelecaniformes

Family Ardeidae

Egretta garzetta Linnaeus, 1766

Little egret

Distribution

Central Lao PDR: Khammouane province: Chout Neouang local market (this study), Nam Kading NBCA river, Nam Kading below NBCA, Nam Kading NBCA (WCS, 1995a); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); southern mountains, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996), Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997; Evans and Timmins, 1998) (Figure 4.40).

Ardea purpurea Linnaeus, 1766

Purple heron

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Northern Extension (Tobias, 1997); western plateau degraded habitat, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996);

wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998); dry dipterocarp forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.41).

Ardeola bacchus Bonaparte, 1855

Chinese pond-heron

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); wet forest logging road, upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); north, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.42).

Butorides striatus Linnaeus, 1758

Green-backed heron

Distribution

Central Lao PDR: Khammouane Province: Kok local market (this study), Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Nam Hai/Nam Hinboun, Pou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Chat, Northern Extension, Northern Extension (Tobias, 1997); Ban Nakadok degraded, middle Nam Xot, southern mountains, western plateau forest, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans,

1996); upper Nam Gnouang/lower Nam Heun, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); Phou Xang He, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995); central, Phou Xang He NBCA (Walstona and Vinton, 1999) (Figure 4.43).

Ixobrychus cinnamomeus Gmelin, 1789

Cinnamon bittern

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA river, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); western plateau degraded habitat, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); Phou Hinho, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.44).

Ixobrychus flavicollis Latham, 1790

Black bittern

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study)
(Figure 4.45).

Order Passeriformes

Family Pittidae

Pitta cyanea Blyth, 1843

Blue pitta

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); central forest area, northern enclave, Phou Hin Poun NBCA (Timmins, 1997); Northern Extension, Nam Pan, Nam Chat, Northern Extension (Tobias, 1997); Ban Nakadok degraded, central mountains over, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins 1998); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998) (Figure 4.46).

Family: Eurylaimidae

Psarisomus dalhousiae Jameson, 1835

Long-tailed broadbill

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nadee limestone, Nam Kading NBCA (WCS, 1995a); central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, middle Nam Xot, central mountains over, cypress forest, Phou Laoko, southern mountains, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Northern Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998); west, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.47).

Family Irenidae

Irena puella Latham, 1790

Asian fairy-bluebird

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nam Hai/Hinboun plain forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a);

Duckworth et al., 1998); central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Khammouane Limestone, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Nam Chat, Northern Extension (Tobias, 1997); Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, central mountains over, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north Houay Clocc, north degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.48).

Family Chloropseidae

Chloropsis moluccensis Gray, 1831

Blue-winged leafbird

Distribution

Central Lao PDR: Khammouane province: Chout Neouang and Kok local market (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Ban Lakkhao, Ban Vangdao, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Khammouane Limestone, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nakai Nam-

Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, central mountains over, cypress forest, southern mountains, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Talee, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999) (Figure 4.49).

Chloropsis hardwickii Jardine & Selby, 1830

Orange-bellied leafbird

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Sayphou Loyang, Pou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, middle Nam Xot, central mountains over, southern mountains, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998);

Nakai Plateau, Nakai Plateau (Duckworth et al., 1998); west, south-east, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.50).

Family Oriolidae

Oriolus chinensis Linnaeus, 1766

Black-naped oriole

Distribution

Central Lao PDR: Khammouane province: Chout Neouang local market (this study), Nakai-Nam Theun NBCA, Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997) (Figure 4.51).

Family Dicuridae

Dicrurus macrocerus Vieillot, 1817

Black drongo

Distribution

Central Lao PDR: Khammouane province: Chout Song and kok local markets (this study), Nakai-Nam Theun NBCA, Nam Chat, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Northern Extension (Tobias, 1997); western plateau degraded habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998); south degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.52).

Dicrurus leucophaeus Vieillot, 1817

Ashy drongo

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrubs, Nam Kading NBCA (WCS, 1995a); Nam Hai/Hinboun plain forest, Pou Hin Poun NBCA (WCS, 1995a); central forest area, southern habitat link, Pou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, central mountains over, western plateau forest, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper Nam Gnouang/lower Nam Heun, middle Nam Heun/lower Nam Cham, upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.53).

Dicrurus hottentottus Linnaeus, 1766

Hair-crested drongo

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrubs, Nam Kading NBCA (WCS, 1995a);

southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Northern Extension (Tobias, 1997); Ban Nakadok degraded, middle Nam Xot, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper Nam Gnouang/lower Nam Heun, upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.54).

Dicrurus paradiseus Linnaeus, 1766

Greater racquet-tailed drongo

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets; Bolikhamxay: Thong Pei local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nadee limestone, Nam Kading NBCA (WCS, 1995a); Nam Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995b); central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, middle Nam Xot, southern

mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper nam Gnouang/lower Nam Heun, middle Nam Heun/lower Nam Cham, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); north Houay Clocc, north degraded, north Houay Talee, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.55).

Family Monarchidae

Hypothymis azurea Boddaert, 1783

Black-naped monarch

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Sayphou Loyang, Khammouane Limestone, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Nam Chat, Northern Extension (Tobias, 1997); Ban Nakadok forest, Middle Nam Xot, southern mountains, western plateau forest, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA,

Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinh, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.56).

Family Turdidae

Turdus cardis Temminck, 1831

Japanese thrush

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Kwai, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998) (Figure 4.57).

Family Muscicapidae

Monticola gularis Swinhoe, 1863

White-throated rock-thrush

Distribution

Central Lao PDR: Khammouane province: Phouthavong local market (this study), scrub, Nadee limestone, Nam Kading NBCA (WCS, 1995a); Northern Extension, Northern Extension (Tobias, 1997); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996) (Figure 4.58).

Monticola solitaries Linnaeus, 1758

Blue rock-thrush

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Kading NBCA river, inundation area, Nam Ao forest, Nam Kading NBCA (WCS, 1995a); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Ban Nakadok degraded, middle Nam Xot, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998), Nakai Plateau, Nakai Plateau (Duckworth et al., 1998); south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, west, Hin Namno NBCA (Walston and Vinton, 1999); dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.59).

Myophonus caeruleus Scopoli, 1786

Blue whistling-thrush

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Kading NBCA river, inundation area, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998). Khammouane Limestone, Nam Hai/Hinboun plain forest, Nam Kading below NBCA, Phou Hin Poun NBCA (WCS, 1995a), Ban Vangdao, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997);

Sayphou Loyang, Khammouane Limestone, Phou Hin Poun NBCA (Duckworth et al., 1998); Northern Extension, Nam Pan, Nam Chat, Northern Extension (Tobias, 1997); Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Kwai, Ban Nakadok forest, middle Nam Xot, central mountains over, cypress forest, western plateau forest, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996) Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.60).

Ficedula zanthopygia Hay, 1845

Yellow-rumped flycatcher

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997) (Figure 4.61).

Ficedula erithacus Jerdon and Blyth, 1861

Slaty-backed flycatcher

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study) (Figure 4.62).

Ficedula hodgsoni Moore, 1854

Pygmy blue flycatcher

Distribution

Central Lao PDR: Khammouane province: Phouthavong local market (this study), Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); cypress forest, Nakai Nam-Theun NBCA (Timmins and Evans, 1996) (Figure 4.63).

Eumyias thalassina Swainson, 1838

Verditer flycatcher

Distribution

Central Lao PDR: Khammouane province: Phouthavong local market (this study), Nam Kading NBCA forest, inundation area, Nam Ao forest, Nam Kading NBCA (WCS, 1995b); Khammouane Limestone, Phou Hin Poun NBCA (WCS, 1995a); Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Northern Extension (Tobias, 1997); Nam Kwai, central mountains over, cypress forest, western plateau degraded habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998);

Duckworth et al., 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north Houay Talee, Hin Namno NBCA (Timmins and Khounboline, 1996); north, Hin Namno NBCA (Walstona and Vinton, 1999) (Figure 4.64).

Cyornis hainanus Ogilvie-Grant, 1900

Hainan blue-flycatcher

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Nam Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995b); Sayphou Loyang, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); southern mountains, western plateau forest, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north, central, west, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.65).

Cyornis banyumas Horsfield, 1821

Hill blue-flycatcher

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nadee limestone, Nam Kading NBCA (WCS, 1995a); Khammouane Limestone, Phou Hin Poun NBCA (WCS, 1995a); Northern Extension, Nam Pan, Northern Extension (Tobias, 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); middle Nam Xot, central mountains over, western plateau forest, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.66).

Lavivora cyane Pallas, 1776

Siberian blue robin

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Chat, Nam Theun Extension (Tobias, 1997); western plateau forest, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998); southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Phou Hinho,

Phou Xang He, mixed deciduous forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.67).

Calliope calliope Pallas, 1776

Siberian rubythroat

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), scrub, Nam Kading NBCA (WCS, 1995a); Nakai-Nam Theun NBCA , Namkai Nam-Theun NBCA (Tobias, 1997); western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998) (Figure 4.68).

Kittacincla malabaricus Scopoli, 1788

White-rumped shama

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Nam Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995b); Ban Lakkhao, central forest area, Phou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Pan, Northern Extension (Tobias, 1997); Ban Nakadok forest, Ban Nakadok degraded, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans,

1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north degraded, south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.69).

Family Stenostiridae

Culicicapa ceylonensis Swainson, 1820

Grey-headed canary-flycatcher

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Ao forest, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Khammouane Limestone, Nam Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995a); Ban Vangdao, central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Khammouane Limestone, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nam Xot, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extention (Tobias, 1997); Nam Kwai, Ban Nakadok forest, middle Nam Xot, central mountains over, cypress forest, southern mountains, western plateau forest, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); wet forest logging road, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA

(Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north degraded, north Houay Talee, south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.70).

Family Sturnidae

Acridotheres tristis Linnaeus, 1766

Common myna

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); southern mountains, western plateau degraded habitat, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998); scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.71).

Gracula religiosa Linnaeus, 1758

Common hill myna

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Ao forest, Nam Kading NBCA (WCS, 1995b); southern

habitat link, Phou Hin Poun NBCA (Timmins, 1997); Northern Extension, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); central mountains over, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); middle Nam Heun/lower Nam Cham, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.72).

Family Pycnonotidae

Brachypodius atriceps Temminck, 1822

Black-headed bulbul

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nakai-Nam Theun NBCA, Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.73).

Pycnonotus flaviventris Tickell, 1833

Black-crested bulbul

Distribution

Central Lao PDR: Khammouane province: Chout Song, Chout Neouang, Kok, Phouthavong, Khounkham local markets (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995a); Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Khammouane Limestone, Phou Hin Poun NBCA (WCS, 1995a; Duckworth et al., 1998); Ban Lakkhao, Ban Vangdao, central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nakai Nam-Theun NBCA (Tobias, 1997); Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, central mountains over, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); upper Nam Cham valley, Nakai Nam-Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); north Houay Clocc, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.74).

Pycnonotus finlaysoni Strickland, 1844

Stripe-throated bulbul

Distribution

Central Lao PDR: Khammouane province: Chout Song, Chout Neouang, Kok, Phouthavong local markets (this study), Nam Kading, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995a); Nakai-Nam Theun NBCA, Nakai Nam-Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); middle Nam Xot, southern mountains, western plateau degraded habitat, western plateau all habitat, Nakai Nam-Theun NBCA (Timmins and Evans, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); mixed deciduous forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.75).

Pycnonotus blanfordi Jerdon, 1862

Streak-eared bulbul

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), mixed deciduous forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.76).

Alophoixus pallidus Swinhoe, 1870

Puff-throated bulbul

Distribution

Central Lao PDR: Khammouane province: Chout Neouang, Kok local markets (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995b); Nadee limestone, Nam Kading NBCA (Duckworth et al., 1998); Nam Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995a); Ban Vangdao, central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Phou Hin Poun NBCA (Duckworth et al., 1998); Khammouane Limestone, Phou Hin Poun NBCA (WCS, 1995a; Duckworth et al., 1998); Nam Mon, Nam Xot, Nam Pan, Nam Chat, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, central mountains over, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, middle Nam Heun/lower Nam Cham, upper Nam Cham valley, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north degraded, north Houay Talee, south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.77).

Iole propinqua Oustalet, 1903

Grey-eyed bulbul

Distribution

Central Lao PDR: Khammouane province: Chout Song, Kok local markets (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nam Kading below NBCA, Nam Kading NBCA (WCS, 1995a), Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Khammouane Limestone, Phou Hin Poun NBCA (WCS, 1995a; Duckworth et al., 1998); Ban Lakkhao, Ban Vangdao, central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Phou Hin Poun NBCA (Duckworth et al., 1998); Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, western plateau forest, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, middle Nam Heun/lower Nam Cham, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north degraded, north Houay Talee, south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.78).

Hypsipetes leucocephalus Gmelin, 1789

Black bulbul

Distribution

Central Lao PDR: Khammouane province: Kok local Market (this study), Nam Kading NBCA forest, inundation area, scrubs, Nam Kading NBCA (WCS, 1995a); southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Pan, Nam Theun Extension (Tobias, 1997); Nam Kwai, middle Nam Xot, western plateau forest, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); Naka-Nam Theun NBCA, Naka-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.79).

Family Leiotrichidae

Garrulax leucolophus Hardwicke, 1815

White-crested laughingthrush

Distribution

Central Lao PDR: Khammouane province: Kok local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrub, Nam Kading NBCA (WCS, 1995a);

Nadee limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); central forest area, southern habitat link, Phou Hin Poun NBCA, Nakai-Nam Theun NBCA (Timmins, 1997); Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); middle Nam Xot, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); Nam Gnouang/lower Nam Heun, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinh, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.80).

Pellorneum ruficeps Swainson, 1832

Puff-throated babbler

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrubs, Nam Kading NBCA (WCS, 1995a); Nam Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995a); Ban Lakkhao, central forest area, northern enclave, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Kwai, Ban Nakadok forest, Ban

Nakadok degraded, middle Nam Xot, central mountains over, southern mountains, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); middle Nam Heun/lower Nam Cham, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north degraded, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.81).

Family Timaliidae

Cyanoderma rufifrons Hume, 1873

Rufous-fronted babbler

Distribution

Central Lao PDR: Khammouane province: Chout Song and Kok local markets (this study), Nakai-Nam Theun NBCA, Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); south-east, Hin Namno NBCA (Walstona and Vinton, 1999) (Figure 4.82).

Macronos gularis Horsfield, 1822

Pin-striped tit-babbler

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, scrub, Nam Kading NBCA (WCS, 1995a), Nadee

limestone, Nam Kading NBCA (WCS, 1995a; Duckworth et al., 1998); Nam Hai/Hinboun plain forest, Nam Hai/Hinboun, Phou Hin Poun NBCA (WCS, 1995a); Ban Lakkhao, Ban Vangdao, central forest area, southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Sayphou Loyang, Phou Hin Poun NBCA (Duckworth et al., 1998); Khammouane Limestone, Phou Hin Poun NBCA (WCS, 1995a; Duckworth et al., 1998); Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Pan, Nam Chat, Nam Theun Extension (Tobias, 1997); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, central mountains over, western plateau forest, western plateau degraded habitat, western plateau all habitat, southern escarpment, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper Nam Gnouang/lower Nam Heun, middle Nam Heun/lower Nam Cham, upper Nam Cham valley, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Duckworth et al., 1998; Evans and Timmins, 1998); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); north Houay Clocc, north degraded, north Houay Talee, south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walston and Vinton, 1999) (Figure 4.83).

Pomatorhinus hypoleucos Blyth, 1844

Large scimitar-babbler

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, scrub, Nam Kading below NBCA, Nam Kading

NBCA (WCS, 1995a); Nam Hai/Hinboun plain forest, Phou Hin Poun NBCA (WCS, 1995a); Ban Lakkhao, central forest area, Phou Hin Poun NBCA (Timmins, 1997); Nakai-Nam Theun NBCA, Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Chat, Nam Theun Extension (Tobias, 1997); Ban Nakadok forest, western plateau forest, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); Nam Theun Extension, Nam Theun Extension (Evans and Timmins, 1998); Nakai Plateau, Nakai Plateau (Evans and Timmins, 1998; Duckworth et al., 1998); north Houay Clocc, north degraded, north Houay Talee, south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, Hin Namno NBCA (Walston and Vinton, 1999); Phou Hinho, Phou Xang He, mixed deciduous forest, dry dipterocarp forest, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.84).

Pomatorhinus schisticeps Hodgson, 1836

White-browed scimitar-babbler

Distribution

Central Lao PDR: Khammouane province: Chout Song local market (this study), Nam Kading NBCA forest, Nam Ao forest, scrubs, Nam Kading NBCA (WCS, 1995a); Nakai-Nam Theun NBCA, Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Northern Extension, Nam Chat, Northern Extension (Tobias, 1997); central mountains over, western plateau degraded habitat, western plateau all habitat, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper Nam Gnouang/lower Nam Heun, middle Nam Heun/lower Nam Cham, upper Nam Cham valley, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau

(Duckworth et al., 1998); central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.85).

Family Nectariniidae

Arachnothera longirostra Latham, 1790

Little spiderhunter

Distribution

Central Lao PDR: Khammouane province: Chout Neouang local market (this study), Nam Kading NBCA forest, scrub, Nam Kading NBCA (WCS, 1995b); southern habitat link, Phou Hin Poun NBCA (Timmins, 1997); Nam Mon, Nakai-Nam Theun NBCA (Tobias, 1997); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997; Evans and Timmins, 1998); Nam Kwai, Ban Nakadok forest, Ban Nakadok degraded, middle Nam Xot, central mountains over, western plateau forest, Nakai-Nam Theun NBCA (Timmins and Evans, 1996); wet forest logging road, upper Nam Cham valley, Nakai-Nam Theun NBCA (Tizard, 1996); Nakai Plateau, Nakai Plateau (Tobias, 1997; Evans and Timmins, 1998); Nam Theun Extension, Nam Theun Extension (Tobias, 1997; Evans and Timmins, 1998); south Houay Pan, Hin Namno NBCA (Timmins and Khounboline, 1996); north, central, west, south-east, Hin Namno NBCA (Walstona and Vinton, 1999); Phou Hinho, scrub, cultivation etc, Phou Xang He NBCA (Thewlis et al., 1995) (Figure 4.86).

Family Estrildidae

Lonchura punctulata Linnaeus, 1758

Scaly-breasted munia

Distribution

Central Lao PDR: Khammouane province: Chout Song and Khounkham local markets (this study), Nam Kading NBCA forest, Nam Kading NBCA (WCS, 1995a); Nakai-Nam Theun NBCA, Nakai-Nam Theun NBCA (Tobias, 1997); Nam Chat, Nam Theun Extension (Tobias, 1997); upper nam Cham valley, Nakai-Nam Thuen NBCA (Tizard, 1996) (Figure 4.87).

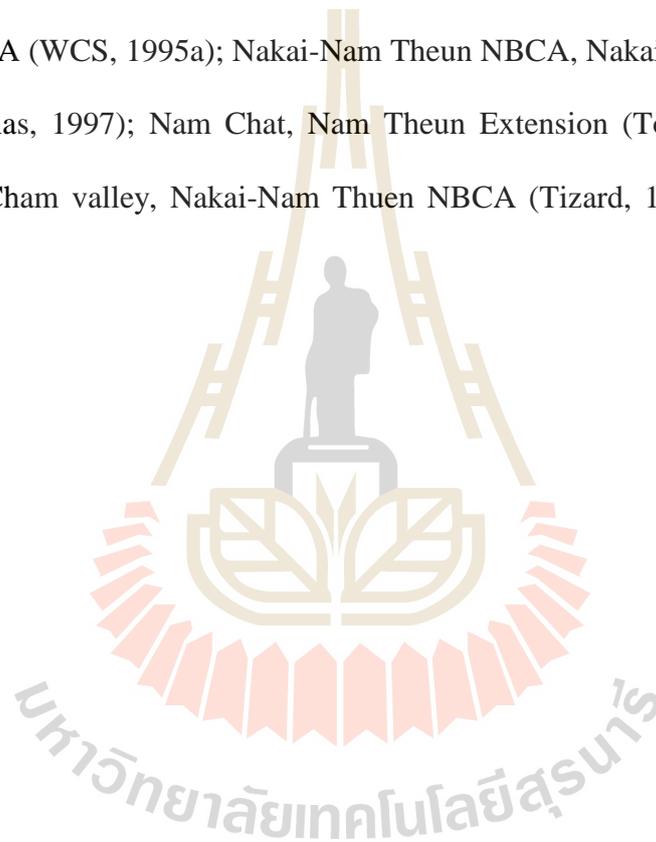


Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
1	Abbott's babbler	<i>Malacocincla abbotti</i>	LC	0	0	0	0	0	x	0	x	6,7
2	Ashy Bulbul	<i>Hemixos flavala</i>	LC	0	x	0	x	x	x	0	0	2,1,3,8,9
3	Ashy drongo	<i>Dicrurus leucophaeus</i>	LC	x	x	x	x	x	x	x	x	2,5,1,3,6,8,9,14,7
4	Ashy minivet	<i>Pericrocotus divaricatus</i>	LC	0	0	0	0	0	x	x	0	1,3,9,14
5	Ashy woodswallow	<i>Artamus fuscus</i>	LC	0	0	0	x	x	x	x	0	1,3,8,14
6	Asian barred owlet	<i>Glaucidium cuculoides</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7
7	Asian brown flycatcher	<i>Muscicapa dauurica</i>	LC	0	x	x	0	0	x	x	x	2,6,14,7
8	Asian emerald cuckoo	<i>Chrysococcyx maculatus</i>	LC	0	x	0	x	x	x	0	0	2,9,1,3,8
9	Asian fairy-bluebird	<i>Irena puella</i>	LC	x	x	x	x	x	x	x	x	2,5,9,1,3,8,4,14,7
10	Asian house-martin	<i>Delichon dasypus</i>	LC	0	0	0	x	x	x	0	0	1,8
11	Asian palm-swift	<i>Cypsiurus balasienis</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,8,9,14,7
12	Asian stubtail	<i>Urosphena squamiceps</i>	LC	0	x	0	x	x	x	x	x	2,1,8,9,14,7
13	Banded bay cuckoo	<i>Cacomantis sonneratii</i>	LC	0	x	x	x	x	x	0	0	2,9,1,3,8
14	Banded kingfisher	<i>Lacedo pulchella</i>	LC	x	x	0	0	0	0	0	x	2,9,7
15	Bar-backed partridge	<i>Arborophila brunneopectus</i>	LC	0	x	0	x	x	x	x	x	2,9,1,3,6,8,4,14,7

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
16	Bar-bellied pitta	<i>Pitta elliotii</i>	LC	0	0	0	0	0	0	x	x	14,7
17	Bare-faced bulbul	<i>Pycnonotus hualon</i>	LC	0	0	0	0	0	0	0	x	12
18	Barn swallow	<i>Hirundo rustica</i>	LC	0	x	x	x	x	x	x	x	2,1,3,8,9,14,7
19	Barred buttonquail	<i>Turnix suscitator</i>	LC	x	0	0	0	0	0	0	0	
20	Barred cuckoo-dove	<i>Macropygia unchall</i>	LC	x	x	x	x	x	x	x	x	2,1,3,6,8,9,4,14,7
21	Bar-throated minla	<i>Chrysominia strigula</i>	LC	0	0	0	0	0	x	0	0	1,3,8
22	Bar-winged flycatcher-shrike	<i>Hemipus picatus</i>	LC	0	x	x	x	x	x	x	0	2,5,1,3,8,4,14
23	Bay woodpecker	<i>Blythipicus pyrrhotis</i>	LC	x	x	0	0	x	x	0	x	2,9,1,3,8,7
24	Beautiful nuthatch	<i>Sitta formosa</i>	VU	0	0	0	0	0	x	0	0	1,3,8
25	Besra	<i>Accipiter virgatus</i>	LC	x	x	0	0	x	x	0	0	2,1,6
26	Black baza	<i>Aviceda leuphotes</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
27	Black bittern	<i>Ixobrychus flavicollis</i>	LC	x	0	0	0	0	0	0	0	
28	Black bulbul	<i>Hypsipetes leucocephalus</i>	LC	x	x	x	x	x	x	x	0	2,5,1,3,8,9,14
29	Black drongo	<i>Dicrurus macrocercus</i>	LC	x	0	0	x	x	x	x	x	1,3,6,8,4,7
30	Black eagle	<i>Ictinaetus malayensis</i>	LC	0	x	0	0	x	x	x	0	2,1,6,8,9,14

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
31	Black kite	<i>Milvus migrans</i>	LC	0	x	0	0	0	0	0	0	2
32	Black stork	<i>Ciconia nigra</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
33	Black-and-buff woodpecker	<i>Meiglyptes jugularis</i>	LC	0	x	x	x	x	x	x	x	2,9,5,1,3,6,8,14,7
34	Black-breasted thrush	<i>Turdus dissimilis</i>	LC	0	0	0	0	0	x	0	0	1,3,9
35	Black-browed fulvetta	<i>Alcippe grotei</i>	LC	0	0	0	0	0	0	x	0	1,4
36	Black-browed reed-warbler	<i>Acrocephalus bistrigiceps</i>	LC	0	0	0	0	x	x	0	0	1,6
37	Black-capped kingfisher	<i>Halcyon pileata</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,14,7
38	Black-chinned yuhina	<i>Yuhina nigrimenta</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
39	Black-collared starling	<i>Gracupica nigricollis</i>	LC	0	x	0	x	0	x	x	x	2,1,3,6,8,9,14,7
40	Black-crested bulbul	<i>Pycnonotus flaviventris</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7
41	Black-eared shrike babbler	<i>Pteruthius melanotis</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
42	Black-headed bulbul	<i>Brachypodius atriceps</i>	LC	x	x	0	x	x	x	x	x	2,1,3,9,14,7
43	Black-headed woodpecker	<i>Picus erthropygius</i>	LC	0	0	0	x	0	x	0	x	1,3,8,9,7
44	Black-hooded oriole	<i>Oriolus xanthornus</i>	LC	0	0	0	x	0	x	x	0	1,3,8,9,4,14
45	Black-naped monarch	<i>Hypothymis azurea</i>	LC	x	x	x	x	x	x	x	x	9,1,3,6,8,14,7

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
46	Black-naped oriole	<i>Oriolus chinensis</i>	LC	x	0	0	0	x	x	0	0	1
47	Black-throated bushtit	<i>Aegithalos concinnus</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
48	Black-throated laughingthrush	<i>Garrulax chinensis</i>	LC	0	x	0	0	x	x	x	0	2,1,3,6,8
49	Black-throated parrotbill	<i>Suthora nipalensis</i>	LC	0	0	0	0	0	x	0	0	1,3
50	Black-throated sunbird	<i>Aethopyga saturata</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
51	Black-winged cuckoo-shrike	<i>Lalage melaschistos</i>	LC	0	x	x	x	x	x	x	0	2,5,1,3,8,4,14
52	Black-winged stilt	<i>Himantopus himantopus</i>	LC	0	0	0	x	0	x	0	0	1,3,6,8,9
53	Black-wingedd kite	<i>Elanus caeruleus</i>	LC	0	x	0	0	0	x	0	0	2,6
54	Blue pitta	<i>Pitta cyanea</i>	LC	x	x	x	0	x	x	0	0	2,5,1,3,8,9
55	Blue rock-thrush	<i>Monticola solitarius</i>	LC	x	x	0	x	0	x	x	x	2,1,3,8,9,14,4,7
56	Blue whistling-thrush	<i>Myophonus caeruleus</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7
57	Blue-and-white flycatcher	<i>Cyanoptila cyanomelana</i>	LC	0	0	0	x	0	x	0	x	1,3,8,7
58	Blue-bearded bee-eater	<i>Nyctornis athertoni</i>	LC	0	0	0	x	x	x	x		2,9,1,3,6,8,14
59	Blue-eared barbet	<i>Psilopogon cyanotis</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
60	Blue-eared kingfisher	<i>Alcedo meninting</i>	LC	0	x	x	x	x	x	x	x	2,9,1,3,6,8,14,7

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
61	Blue-naped pitta	<i>Pitta nipalensis</i>	LC	0	x	0	0	0	x	0	0	2,6
62	Blue-rumped pitta	<i>Pitta soror</i>	LC	0	x	0	0	x	x	x	0	2,1,3,8,9,4,14
63	Blue-tailed bee-eater	<i>Merops philippinus</i>	LC	0	0	0	x	x	x	0	0	1,3,8
64	Blue-throated barbet	<i>Psilopogon asiatica</i>	LC	0	0	0	0	x	x	0	0	1,3,6,8,14
65	Blue-throated bee-eater	<i>Merops viridis</i>	LC	0	x	0	x	0	x	0	0	2,9,1,3,8
66	Blue-throated blue-flycatcher	<i>Cyornis rubeculoides</i>	LC	0	0	0	0	0	0	x	x	14,7
67	Blue-winged leafbird	<i>Chloropsis moluccensis</i>	LC	x	x	x	x	x	x	x	0	2,5,9,1,3,8
68	Blue-winged minla	<i>Siva cyanouroptera</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
69	Blyth's kingfisher	<i>Alcedo hercules</i>	NT	0	x	0	0	x	x	x	x	2,9,1,3,6,14,7
70	Blyth's leaf warbler	<i>Phylloscopus reguloides</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
71	Bronzed drongo	<i>Dicrurus aeneus</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
72	Brown boobook	<i>Ninox scutulata</i>	LC	0	0	x	0	0	x	0	0	5,1,3,8,9
73	Brown dipper	<i>Cinclus pallasii</i>	LC	0	x	0	0	x	x	0	0	2,1,3,6,8
74	Brown grasshopper-warbler	<i>Locustella luteoventris</i>	LC	0	0	0	0	x	0	0	0	1
75	Brown shrike	<i>Lanius cristatus</i>	LC	0	x	0	x	x	x	x	0	2,1,3,6,8,14

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
76	Brown wood-owl	<i>Strix leptogrammica</i>	LC	0	0	0	0	x	x	0	0	1,3
77	Brown-backed needletail	<i>Hirundapus giganteus</i>	LC	0	x	x		x	x	0	x	2,5,1,3,6,8,9,7
78	Buff-breasted babbler	<i>Trichastoma tickelli</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
79	Buff-spotted flameback	<i>Chrysocolaptes lucidus</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,14,7
80	Burmese shrike	<i>Lanius colluriooides</i>	LC	0	0	0	0	x	x	0	0	1,3,9
81	Cattle egret	<i>Bubulcus ibis</i>	LC	0	x	0	0	0	x	0	0	2,1
82	Changeable hawk eagle	<i>Nisaetus cirrhatus</i>	LC	0	0	0		x	0	x	0	1,14
83	Chestnut bunting	<i>Emberiza rutila</i>	LC	0	x	0	x	x	x	0	0	2,1,3,8
84	Chestnut thrush	<i>Turdus rubrocanus</i>	LC	0	0	0	0	0	0	x	0	9,14
85	Chestnut-capped babbler	<i>Timalia pileata</i>	LC	0	x	0	0	x	0	x	x	2,1,14,7
86	Chestnut-crowned laughingthrush	<i>Trochalopteron erythrocephalus</i>	LC	0	0	0	0	0	x	0	0	1,3,8
87	Chestnut-crowned warbler	<i>Phylloscopus castaniceps</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
88	Chestnut-eared bunting	<i>Emberiza fucata</i>	LC	0	0	0	x	0	x	0	0	1,3,8
89	Chestnut-flanked white-eye	<i>Zosterops erythropleurus</i>	LC	0	0	0	0	0	x	0	0	1

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
90	Chestnut-fronted shrike babbler	<i>Pteruthius aenobarbus</i>	LC	0	x	0	x	x	x	0	0	2,9,1,3,6,8
91	Chestnut-headed bee-eater	<i>Merops leschenaulti</i>	LC	0	0	0	0	x	x	0	0	1,6
92	Chestnut-tailed starling	<i>Sturnus malabaricus</i>	LC	0	0	0	0	0	x	0	0	3,8
93	Chestnut-winged cuckoo	<i>Clamator coromandus</i>	LC	x	x	0	x	0	x	x	x	2,9,1,3,6,8,14,7
94	Chinese francolin	<i>Francolinus pintadeanus</i>	LC	0	0	0	x	0	x	x	0	1,3,8,9,14
95	Chinese hwamei	<i>Garrulax canorus</i>	LC	0	0	0	0	x	0	0	0	1
96	Chinese pond-heron	<i>Ardeola bacchus</i>	LC	x	0	0	0	x	x	x	x	1,6,14,7
97	Chinese sparrowhawk	<i>Accipiter soloensis</i>	LC	0	x	0	0	x	x	x	0	2,1,3,6,9,14
98	Cinnamon bittern	<i>Ixobrychus cinnamomeus</i>	LC	x	x	0	x	x	x	0	x	2,1,3,8,9,7
99	Collared owlet	<i>Glaucidium brodiei</i>	LC	x	x	x	x	x	x	x	x	2,5,1,3,6,8,9,14,7
100	Collared sand martin	<i>Riparia riparia</i>	LC	0	0	0	x	0	x	0	0	1,3,9
101	Collared scops-owl	<i>Otus lettia</i>	LC	x	x	0	0	0	x	0	0	2,3,9
102	Common buzzard	<i>Buteo buteo</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
103	Common cuckoo	<i>Cuculus canorus</i>	LC	0	x	0	x	x	x	0	x	2,1,3,6,8,7
104	Common flameback	<i>Dinopium javanense</i>	LC	0	0	0	0	0	0	0	x	7

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
105	Common green magpie	<i>Cissa chinensis</i>	LC	0	x	0	x	x	x	x	0	2,1,3,6,8,9,14
106	Common greenshank	<i>Tringa nebularia</i>	LC	0	0	0	0	0	x	0	0	1,3,9
107	Common hill myna	<i>Gracula religiosa</i>	LC	x	x	x	x	x	x	x	x	2,5,1,3,8,9,14,7
108	Common iora	<i>Aegithina tiphia</i>	LC	0	0	0	x	0	x	0	x	1,3,8,9,7
109	Common kestrel	<i>Falco tinnunculus</i>	LC	0	0	0	x	0	x	0	0	1,3,8
110	Common kingfisher	<i>Alcedo atthis</i>	LC	0	x	0	x	x	x	0	0	2,9,1,3,6,8
111	Common moorhen	<i>Gallinula chloropus</i>	LC	x	x	0	x	x	x	x	x	2,1,3,6,8,9,4,14,7
112	Common myna	<i>Acridotheres tristis</i>	LC	x	0	0	x	0	x	0	x	1,3,8,9,7
113	Common redshank	<i>Tringa totanus</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
114	Common sandpiper	<i>Actitis hypoleucos</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
115	Common snipe	<i>Gallinago gallinago</i>	LC	0	0	x	0	x	0	0	0	2,1
116	Common stonechat	<i>Saxicola torquata</i>	LC	0	x	x	x	x	x	0	x	2,5,1,3,6,8,9,7
117	Common tailorbird	<i>Orthotomus sutorius</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,4,14,7
118	Common teal	<i>Anas crecca</i>	LC	0	0	0	x	0	x	0	0	3,8
119	Common wood-shrike	<i>Tephrodornis pondicerianus</i>	LC	0	0	0	x	0	x	x	0	3,8,14

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
120	Coppersmith barbet	<i>Psilopogon haemacephala</i>	LC	0	x	x	x	0	x	x	x	2,5,9,1,3,6,8,14,7
121	Coral-billed ground-cuckoo	<i>Carpococcyx renauldi</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
122	Coral-billed scimitar-babbler	<i>Pomatorhinus ferruginosus</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
123	Crested argus	<i>Rheinardia ocellata</i>	NT	0	0	0	x	x	x	x	0	1,3,6,8,4,14
124	Crested goshawk	<i>Accipiter trivirgatus</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7
125	Crested kingfisher	<i>Megaceryle lugubris</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,14,7
126	Crested myna	<i>Acridotheres cristatellus</i>	LC	0	0	0	x	0	x	x	x	3,9,4,7
127	Crested serpent eagle	<i>Spilornis cheela</i>	LC	0	0	0	x	0	x	0	0	3,8,9
128	Crimson sunbird	<i>Aethopyga siparaja</i>	LC	0	x	x	x	x	x	x	0	2,5,1,3,6,8,9,14
129	Crow-billed drongo	<i>Dicrurus annectans</i>	LC	0	x	0	0	x	x	0	x	2,1,6,7
130	Dark-necked tailorbird	<i>Orthotomus atrogularis</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
131	Dark-sided flycatcher	<i>Muscicapa sibirica</i>	LC	0	x	0	x	x	x	0	x	2,1,3,8,7
132	Dark-sided thrush	<i>Zoothera marginata</i>	LC	0	x	0	0	0	x	0	x	2,9,1,3,8,7
133	Dusky broadbill	<i>Corydon sumatranus</i>	LC	0	x	0	0	0	x	x	x	2,1,3,8,14,7
134	Dusky crag martin	<i>Ptyonoprogne concolor</i>	LC	0	x	0	0	0	0	0	0	9

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
135	Dusky fulvetta	<i>Schoeniparus brunnea</i>	LC	0	0	0	0	0	x	0	0	3
136	Dusky warbler	<i>Phylloscopus fuscatus</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,7
137	Eared pitta	<i>Pitta phayrei</i>	LC	0	x	0	0	0	0	x	0	2,4,14
138	Eastern crowned warbler	<i>Phylloscopus coronatus</i>	LC	0	x	0	x	x	x	0	0	2,1,3,9
139	Eastern spotted dove	<i>Spilopelia chinensis</i>	LC	x	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7
140	Eurasian blackbird	<i>Turdus merula</i>	LC	0	x	0	x	0	x	x	0	2,1,3,8,9,4,14,7
141	Eurasian jay	<i>Garrulus glandarius</i>	LC	0	0	0	x	0	x	x	0	1,3,8,9,14
142	Eurasian scops-owl	<i>Otus scops</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7
143	Eurasian sparrowhawk	<i>Accipiter nisus</i>	LC	0	x	0	0	0	x	0	0	2,3,9
144	Eurasian tree sparrow	<i>Passer montanus</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,4,14,7
145	Eurasian woodcock	<i>Scolopax rusticola</i>	LC	0	x	0	x	0	x	x	0	2,1,3,8,9,14
146	Eyebrowed thrush	<i>Turdus obscurus</i>	LC	0	x	0	0	x	x	0	0	2,1,3,6,8,9
147	Eyebrowed wren babbler	<i>Napothera epilepidota</i>	LC	0	x	0	0	x	x	x	0	2,1,3,6,8,9,4,14
148	Fairy pitta	<i>Pitta nympha</i>	VU	0	0	0	0	0	0	x	0	13
149	Ferruginous flycatcher	<i>Muscicapa ferruginea</i>	LC	0	0	0	0	0	0	x	0	14

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
150	Fire-breasted flowerpecker	<i>Dicaeum ignipectus</i>	LC	0	0	0	x	x	x	0	0	1,6,8
151	Flavescent bulbul	<i>Pycnonotus flavescens</i>	LC	0	0	0	x	x	0	0	0	1
152	Forest wagtail	<i>Dendronanthus indicus</i>	LC	0	x	0	x	x	x	0	x	2,1,3,6,8,7
153	Fork-tailed sunbird	<i>Aethopyga latouchii</i>	LC	0	0	0	x	x	x	x	0	1,3,6,8,4,14
154	Fujian niltava	<i>Niltava davidi</i>	LC	0	x	0	x	x	x	0	0	2,1,3,9
155	Fulvous-breasted woodpecker	<i>Dendrocopos macei</i>	LC	0	x	x	x	x	x	0	0	2,5,9,1,3,6,8
156	Garganey	<i>Spatula querquedula</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
157	Golden babbler	<i>Cyanoderma chrysaeum</i>	LC	0	x	x	x	x	x	0	0	2,9,1,3,6,8
158	Golden parrotbill	<i>Suthora verreauxi</i>	LC	0	0	0	0	0	0	0	0	8
159	Golden-crested myna	<i>Ampeliceps coronatus</i>	LC	0	0	0	x	x	x	0	x	1,3,8,7
160	Golden-fronted leafbird	<i>Chloropsis aurifrons</i>	LC	0	0	0	x	0	x	x	0	1,3,8,9,14
161	Golden-spectacled warbler	<i>Phylloscopus burkii</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
162	Golden-throated barbet	<i>Psilopogon franklinii</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,8,4,14,7
163	Gould's sunbird	<i>Aethopyga gouldiae</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
164	Great barbet	<i>Psilopogon virens</i>	LC	0	x	0	x	0	x	x	0	2,9,1,3,8,4,14

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
165	Great eared-nightjar	<i>Lyncornis macrotis</i>	LC	0	0	0	x	0	x	0	0	1,8
166	Great hornbill	<i>Buceros bicornis</i>	NT	0	x	x	x	0	x	x	x	2,5,9,1,3,8,4,14,7
167	Great iora	<i>Aegithina lafresnayei</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
168	Great slaty woodpecker	<i>Mulleripicus pulverulentus</i>	VU	0	x	x	x	0	x	x	x	2,5,1,3,8,9,4,14,7
169	Great white egret	<i>Ardea alba</i>	LC	0	0	0	0	x	0	0	0	1
170	Greater coucal	<i>Centropus sinensis</i>	LC	x	x	0	x	x	x	x	0	2,1,3,6,8,9,14
171	Greater necklaced laughingthrush	<i>Garrulax pectoralis</i>	LC	0	0	0	x	x	x	x	0	1,3,6,8,9,14
172	Greater racquet-tailed drongo	<i>Dicrurus paradiseus</i>	LC	x	x	x	x	x	x	x	x	2,5,1,3,6,8,4,14,7
173	Greater spotted eagle	<i>Clanga clanga</i>	VU	0	0	0	x	x	x	0	0	1,8
174	Greater yellownape	<i>Chrysophegma flavinucha</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7
175	Green bee-eater	<i>Merops orientalis</i>	LC	0	x	x	x	x	x	x	x	2,9,1,3,6,8,14
176	Green cochoa	<i>Cochoa viridis</i>	LC	0	x	0	x	x	x	x	0	2,1,3,8,14
177	Green imperial pigeon	<i>Ducula aenea</i>	LC	0	x	0	0	0	0	0	0	2
178	Green peafowl	<i>Pavo muticus</i>	EN	0	x	0	x	0	x	x	0	2,3,8,14

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
179	Green sandpiper	<i>Tringa ochropus</i>	LC	0	0	x	x	0	x	0	0	2,1,3,8,9
180	Green-backed heron	<i>Butorides striatus</i>	LC	x	x	x	x	x	x	x	x	5,1,3,6,9,4,14,7
181	Green-backed tit	<i>Parus monticolus</i>	LC	0	0	0	0	0	0	x	0	14
182	Green-billed malkoha	<i>Phaenicophaeus tristis</i>	LC	x	0	0	x	0	x	0	x	9,1,3,8,7
183	Green-eared barbet	<i>Psilopogon faiostricta</i>	LC	x	x	x	x	0	x	x	x	2,5,9,1,3,8,14,7
184	Greenish warbler	<i>Phylloscopus trochiloides</i>	LC	0	0	0	x	x	x	0	x	1,8,9,7
185	Green-tailed sunbird	<i>Aethopyga nipalensis</i>	LC	0	0	0	0	0	x	0	0	1,3,8
186	Grey bushchat	<i>Saxicola ferreus</i>	LC	0	x	x	0	0	x	0	0	2,5,1,3,8,9
187	Grey heron	<i>Ardea cinerea</i>	LC	0	0	0	x	0	x	0	x	1,3,8,9,7
188	Grey laughingthrush	<i>Garrulax maesi</i>	LC	0	x	0	x	x	x	0	0	2,1,3,6,8,9
189	Grey peacock pheasant	<i>Polyplectron icalcaratum</i>	LC	0	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7
190	Grey treepie	<i>Dendrocitta formosae</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8,9
191	Grey wagtail	<i>Motacilla cinerea</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,8,9,4,14,7
192	Grey-backed shrike	<i>Lanius tephronotus</i>	LC	0	x	0	0	x	x	0	0	2,1,3,8,9
193	Grey-breasted prinia	<i>Prinia hodgsonii</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
194	Grey-capped woodpecker	<i>Picoides canicapillus</i>	LC	0	x	0	x	x	x	x	x	2,1,3,8,9,14,7
195	Grey-capped emerald dove	<i>Chalcophaps indica</i>	LC	x	x	0	x	x	x	x	0	2,9,1,3,8,,4,14
196	Grey-cheeked fulvetta	<i>Alcippe morrisonia</i>	LC	0	0	0	x	x	x	0	0	1,6,8,9
197	Grey-cheeked warbler	<i>Phylloscopus poliogenys</i>	LC	0	0	0	x	x	x	0	0	1,3,8
198	Grey-chinned minivet	<i>Pericrocotus solaris</i>	LC	0	0	0	0	x	x	0	0	1,3,6,8
199	Grey-eyed bulbul	<i>Iole propinqua</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7
200	Grey-faced woodpecker	<i>Picus canus</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,8,9,14,7
201	Grey-faced buzzard	<i>Butastur indicus</i>	LC	0	0	0	x	x	x	0	0	1,3,8,9
202	Grey-faced tit babbler	<i>Macronos kelleyi</i>	LC	0	0	x	0	0	0	0	x	5,7
203	Grey-headed canary-flycatcher	<i>Culicicapa ceylonensis</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7
204	Grey-headed fish-eagle	<i>Ichthyophaga ichthyaetus</i>	NT	0	x	0	x	x	x	x	0	2,1,3,8,9,4,14
205	Grey-headed lapwing	<i>Vanellus cinereus</i>	LC	0	x	x	x	0	x	x	0	2,1,3,6,8,9,14
206	Grey-headed parakeet	<i>Psittacula finschii</i>	NT	0	x	x	x	0	x	x	x	2,5,1,3,8,9,4,14,7
207	Grey-headed parrotbill	<i>Paradoxornis gularis</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
208	Greylag goose	<i>Anser anser</i>	LC	0	0	0	x	0	x	0	0	3,8

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
209	Grey-sided thrush	<i>Turdus feae</i>	VU	0	0	0	0	0	x	0	0	1,3,9
210	Grey-throated babbler	<i>Stachyris nigriceps</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,4,14,7
211	Hainan blue-flycatcher	<i>Cyornis hainanus</i>	LC	x	x	x	x	x	x	x	x	2,9,1,3,6,8,14,7
212	Hair-crested drongo	<i>Dicrurus hottentottus</i>	LC	x	x	x	x	x	x	x	x	2,5,1,3,6,8,9,14,7
213	Heart-spotted woodpecker	<i>Hemicircus canente</i>	LC	0	x	0	x	0	x	0	x	2,1,3,8,9,7
214	Hen harrier	<i>Circus cyaneus</i>	LC	0	0	0	x	0	0	0	0	8
215	Hill blue-flycatcher	<i>Cyornis banyumas</i>	LC	x	x	x	x	x	x	x		2,9,1,3,8,4,14
216	Hill prinia	<i>Prinia superciliaris</i>	LC	0	x	0	0	x	x	0	0	2,1,3,6
217	Himalayan cutia	<i>Cutia nipalensis</i>	LC	0	0	0	0	0	x	0	0	1,3
218	Hodgson's frogmouth	<i>Batrachostomus hodgsoni</i>	LC	0	0	0	0	0	0	0	x	7
219	Indian cuckoo	<i>Cuculus micropterus</i>	LC	0	x	0		x	x	x	0	2,1,6,14
220	Indian cuckoo-shrike	<i>Coracina macei</i>	LC	0	x	x	x	x	x	x	0	2,5,1,3,6,8,9,4,14
221	Indian nuthatch	<i>Sitta castanea</i>	LC	0	x	0	x	x	x	0	x	2,1,3,8,9,7
222	Indian paradise-flycatcher	<i>Terpsiphone paradisi</i>	LC	0	x	x	0	x	x	0	x	2,9,1,3,6,8,7
223	Indian roller	<i>Coracias benghalensis</i>	LC	x	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
224	Indochinese green magpie	<i>Cissa hypoleuca</i>	LC	0	0	0	0	x	x	x	0	1,14
225	Intermediate egret	<i>Ardea intermedia</i>	LC	0	0	x	0	0	0	0	0	2
226	Japanese robin	<i>Lavivora akahige</i>	LC	0	0	0	0	0	x	0	0	11
227	Japanese sparrowhawk	<i>Accipiter gularis</i>	LC	x	0	0	0	x	0	0	0	2,1
228	Japanese thrush	<i>Turdus cardis</i>	LC	x	0	0	0	x	x	0	0	1,3,8
229	Japanese white-eye	<i>Zosterops japonicus</i>	LC	0	0	0	x	x	x	x	0	1,14
230	Japanees paradise-flycatcher	<i>Terpsiphone atrocaudata</i>	NT	0	0	0	0	0	x	0		1,3
231	Java frogmouth	<i>Batrachostomus javensis</i>	LC	0	0	0	0	x	x	0	0	1,6,8,9
232	Javan broadbill	<i>Eurylaimus javanicus</i>	NT	0	x	0	0	0	x	x	x	2,1,3,8,14,7
233	Jerdon's baza	<i>Aviceda jerdoni</i>	LC	0	0	x	0	0	0	0	0	2
234	Jerdon's bushchat	<i>Saxicola jerdoni</i>	LC	0	0	0	0	x	0	0	0	1
235	Jungle nightjar	<i>Caprimulgus indicus</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,14,7
236	Kentish plover	<i>Charadrius alexandrinus</i>	LC	0	0	x	x	0	x	0	0	2,1,3,8,9
237	Kittlitz's murrelet	<i>Brachyramphus brevirostris</i>	NT	0	0	0	0	0	0	0	x	7
238	Laced woodpecker	<i>Picus vittatus</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
239	Lanceolated warbler	<i>Locustella lanceolata</i>	LC	0	x	0	x	x	x	0	x	2,1,3,6,8,9,7
240	Large hawk cuckoo	<i>Hierococcyx sparverioides</i>	LC	0	0	0	0	x	0	0	x	1,7
241	Large niltava	<i>Niltava grandis</i>	LC	0	0	0	0	0	x	0	0	1,3,8
242	Large scimitar-babbler	<i>Pomatorhinus hypoleucos</i>	LC	x	x	x	x	x	x	x	x	2,5,1,3,8,9,4,14,7
243	Large wood-shrike	<i>Tephrodornis virgatus</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,8,4,14,7
244	Large-billed crow	<i>Corvus macrorhynchos</i>	LC	0	x	0	x	x	x	x	0	2,1,3,6,8,9,14
245	Large-tailed nightjar	<i>Caprimulgus macrurus</i>	LC	0	x	0	0	0	0	x	0	2,14
246	Lemon-rumped leaf-warbler	<i>Phylloscopus chloronotus</i>	LC	0	x	0	x	x	x	0	0	2,1,3
247	Lesser coucal	<i>Centropus bengalensis</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
248	Lesser fish-eagle	<i>Ichthyophaga humilis</i>	NT	0	0	0	x	0	x	0	0	3,8
249	Lesser necklaced laughingthrush	<i>Garrulax monileger</i>	LC	0	0	x	x	x	x	x	x	5,1,3,8,9,4,14,7
250	Lesser racquet-tailed drongo	<i>Dicrurus remifer</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,4,14,7
251	Lesser shortwing	<i>Brachypteryx leucophrys</i>	LC	0	0	0	0	x	x	0	0	1,3,8
252	Lesser whistling-duck	<i>Dendrocygna javanica</i>	LC	x	0	0	x	0	x	x	0	3,8,14
253	Lesser yellownape	<i>Picus chlorolophus</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
254	Limestone leaf-warbler	<i>Phylloscopus calciatilis</i>	LC	0	x	0	0	0	0	x	0	10
255	Lineated barbet	<i>Psilopogon lineata</i>	LC	x	x	x	x	x	x	x	x	2,5,9,1,3,6,8,,4,14,7
256	Little bunting	<i>Emberiza pusilla</i>	LC	0	0	0	0	0	x	0	0	1,3,8
257	Little egret	<i>Egretta garzetta</i>	LC	x	x	x		x	x	0	0	2,1,3,6,8
258	Little grebe	<i>Tachybaptus ruficollis</i>	LC	0	x	x	x	0	x	0	0	2,1,3,8,9
259	Little pied flycatcher	<i>Ficedula westermanni</i>	LC	0	0	0	0	0	x	0	0	1,3,8
260	Little pratincole	<i>Glareola lactea</i>	LC	0	0	0	0	0	x	0	0	1
261	Little ringed plover	<i>Charadrius dubius</i>	LC	0	0	0	0	0	x	0	0	1,3,9
262	Little spiderhunter	<i>Arachnothera longirostra</i>	LC	x	x	x	x	x	x	x	x	2,5,1,3,8,4,14,7
263	Little swift	<i>Apus affinis</i>	LC	0	0	0	x	x	x	x	x	1,3,6,8,14,7
264	Long-billed plover	<i>Charadrius placidus</i>	LC	0	0	x	0	0	x	0	0	2,1,3,9
265	Long-tailed broadbill	<i>Psarisomus dalhousiae</i>	LC	x	x	x	x	x	x	x	x	2,5,9,1,3,8,,14,7
266	Long-tailed shrike	<i>Lanius schach</i>	LC	0	0	0	x	0	x	x	0	1,8,14
267	Long-tailed sibia	<i>Heterophasia picaoides</i>	LC	0	0	0	0	0	x	0	0	1,3,8
268	Malay hawk cuckoo	<i>Hierococcyx fugax</i>	LC	0	x	0	x	x	x	0	0	2,9,1,3,6,8

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
269	Malayan night-heron	<i>Gorsachius melanolophus</i>	LC	0	0	0	0	x	x	0	0	1,6
270	Manchurian bush-warbler	<i>Horornis canturians</i>	LC	0	0	0	0	0	x	0	0	3
271	Maroon oriole	<i>Oriolus traillii</i>	LC	0	x	0	x	x	x	x	0	2,1,3,6,8,9,14
272	Marsh sandpiper	<i>Tringa stagnatilis</i>	LC	0	0	0	0	0	x	0	0	1,3,9
273	Mountain bulbul	<i>Ixos maclellandii</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
274	Mountain fulvetta	<i>Alcippe peracensis</i>	LC	0	0	0	0	0	0	0	x	7
275	Mountain hawk-eagle	<i>Nisaetus nipalensis</i>	LC	0	0	0	x	x	x	x	0	1,3,8,9,14
276	Mountain imperial-pigeon	<i>Ducula badia</i>	LC	0	0	0	x	x	x	0	0	1,3,8,9
277	Mountain scops-owl	<i>Otus spilocephalus</i>	LC	0	x	0	0	0	x	x	0	2,1,3,8,14
278	Mountain tailorbird	<i>Phyllergates cuculatus</i>	LC	0	0	0	x	x	x	0	0	1,3,8
279	Moustached barbet	<i>Psilopogon incognita</i>	LC	x	0	0	0	x	x	0	0	1,6,4
280	Mugimaki flycatcher	<i>Ficedula mugimaki</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8,9
281	Napal house-martin	<i>Delichon nipalense</i>	LC	0	x	0	0	0	0	0	0	2
282	Nilgiri flowerpecker	<i>Dicaeum concolor</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7
283	Northern house martin	<i>Delichon urbicum</i>	LC	0	0	0	x	0	0	0	0	9

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
284	Northern pintail	<i>Anas acuta</i>	LC	0	0	0	x	0	x	0	0	3,8
285	Olive-backed pipit	<i>Anthus hodgsoni</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
286	Olive-backed sunbird	<i>Cinnyris jugularis</i>	LC	0	0	0	0	0	0	0	x	7
287	Orange-bellied leafbird	<i>Chloropsis hardwickii</i>	LC	x	x	x	0	x	x	x	0	2,9,,1,3,6,8,14
288	Orange-breasted trogon	<i>Harpactes oreskios</i>	LC	0	x	x	x	x	x	x	0	2,5,1,3,8,4,14
289	Orange-flanked bush robin	<i>Tarsiger cyanurus</i>	LC	0	x	0	x	0	x	x	0	2,1,3,8,9,14
290	Orange-headed-thrush	<i>Geokichla citrina</i>	LC	0	0	0	0	0	x	0	0	1,3,8
291	Oriental bay-owl	<i>Phodilus badius</i>	LC	x	0	0	x	x	x	x	x	1,8,9,14,7
292	Oriental cuckoo	<i>Cuculus saturatus</i>	LC	0	0	x	0	0	0	0	0	9
293	Oriental darter	<i>Anhinga melanogaster</i>	NT	0	x	0	0	0	0	0	0	2
294	Oriental dollarbird	<i>Eurystomus orientalis</i>	LC	0	x	0	x	0	x	x	x	2,9,1,3,6,8,14,7
295	Oriental dwarf kingfisher	<i>Ceyx erithacus</i>	LC	0	x	0	x	x	x	0	x	2,9,1,3,8,7
296	Oriental hobby	<i>Falco severus</i>	LC	0	x	0	0	0	x	x	0	1,3,9,14
297	Oriental honey-buzzard	<i>Pernis ptilorhynchus</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7
298	Oriental magpie robin	<i>Copsychus saularis</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
299	Oriental pied hornbill	<i>Anthracoceros albirostris</i>	LC	0	0	x	x	0	x	x	x	2,5,9,1,8,14,7
300	Oriental pratincole	<i>Glareola maldivarum</i>	LC	0	0	0	x	0	x	0	x	1,3,8,9,7
301	Oriental reed-warbler	<i>Acrocephalus orientalis</i>	LC	0	0	0	0	x	x	0	0	1
302	Oriental scops-owl	<i>Otus sunia</i>	LC	x	x	0	0	0	0	0	0	2
303	Oriental skylark	<i>Alauda gulgula</i>	LC	0	0	0	0	x	0	0	0	8
304	Oriental turtle-dove	<i>Streptopelia orientalis</i>	LC	x	x	0	x	0	x	x	x	2,1,3,8,9,14,7
305	Oriental white-eye	<i>Zosterops palpebrosus</i>	LC	0	0	0	0	x	x	x	0	1,14
306	Pacific swift	<i>Apus pacificus</i>	LC	0	x	0	0	0	0	0	0	2,9
307	Paddyfield pipit	<i>Anthus rufulus</i>	LC	0	0	0	0	x	x	0	0	1,3,8
308	Pale blue-flycatcher	<i>Cyornis unicolor</i>	LC	0	x	x	x	x	x	0	0	2,9,1,3,8,9
309	Pale-bellied myna	<i>Acridotheres cinereus</i>	LC	0	x	0	x	0	x	0	x	2,1,3,6,8,9,7
310	Pale-capped pigeon	<i>Columba punicea</i>	VU	0	0	0	x	0	x	0	0	1,3,8,9
311	Pale-headed woodpecker	<i>Gecinulus grantia</i>	LC	0	x	0	x	x	x	x	x	2,1,3,8,9,4,14,7
312	Pale-legged leaf-warbler	<i>Phylloscopus tenellipes</i>	LC	0	x	0	x	0	x	x	x	2,1,3,8,9,14,7
313	Pallas's grasshopper-warbler	<i>Locustella certhiola</i>	LC	0	0	0	0	0	x	0	0	1,6

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
314	Peregrine falcon	<i>Falco peregrinus</i>	LC	0	x	0	0	0	0	x	0	2,14
315	Pheasant-tailed jacana	<i>Hydrophasianus chirurgus</i>	LC	0	x	x	x	0	x	0	x	2,1,8,9,7
316	Pied falconet	<i>Microhierax melanoleucos</i>	LC	0	0	0	x	x	x	x	0	1,3,8,9,4,14
317	Pied harrier	<i>Circus melanoleucos</i>	LC	0	0	0	0	x	x	0	0	1,3,9
318	Pink-necked green pigeon	<i>Treron vernans</i>	LC	0	x	x	x	x	x	x	x	2,9,5,1,3,8,14,7
319	Pin-striped tit-babbler	<i>Macronos gularis</i>	LC	x	x	x	x	x	x	x	0	2,9,5,1,3,6,8,4,14
320	Pintail snipe	<i>Gallinago stenura</i>	LC	0	0	0	0	0	x	0	0	1,3,9
321	Pin-tailed green pigeon	<i>Treron apicauda</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,14,7
322	Pin-tailed parrotfinch	<i>Erythrura prasina</i>	LC	0	x	x	0	0	x	0	0	2,1
323	Plain prinia	<i>Prinia inornata</i>	LC	0	0	0	x	0	x	0	0	3,8
324	Plain-backed sparrow	<i>Passer flaveolus</i>	LC	0	0	0	x	0	x	0	0	3,8
325	Plaintive cuckoo	<i>Cacomantis merulinus</i>	LC	0	x	x	x	x	x	x	x	2,9,1,3,8,14,7
326	Plumbeous water-redstart	<i>Phoenicurus fuliginosus</i>	LC	0	x	0	x	x	x	0	0	2,1,3,8,9
327	Puff-throated babbler	<i>Pellorneum ruficeps</i>	LC	x	x	x	x	0	x	x	x	2,5,1,3,6,8,9,4,14,7
328	Puff-throated bulbul	<i>Alophoixus pallidus</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
329	Purple cochoa	<i>Cochoa purpurea</i>	LC	0	0	0	0	0	x	0	0	3
330	Purple heron	<i>Ardea purpurea</i>	LC	x	0	0	0	x	x	0	x	1,3,6,9,7
331	Purple sunbird	<i>Cinnyris asiatica</i>	LC	0	0	0	0	0	0	0	x	7
332	Purple-naped spiderhunter	<i>Arachnothera hypogrammicum</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
333	Pygmy blue flycatcher	<i>Ficedula hodgsoni</i>	LC	x	0	0	0	0	x	0	0	1,3,8
334	Pygmy wren-babbler	<i>Pnoepyga pusilla</i>	LC	0	0	0	0	0	x	0	0	1,3,8
335	Racket-tailed treepie	<i>Crypsirina temia</i>	LC	0	x	0	x	0	x	x	0	2,1,3,8,9,4,14
336	Radde's warbler	<i>Phylloscopus schwarzi</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7
337	Ratchet-tailed treepie	<i>Temnurus temnurus</i>	LC	0	x	x	x	x	x	x	0	2,9,5,1,3,6,8,4,14
338	Red junglefowl	<i>Gallus gallus</i>	LC	x	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7
339	Red-billed blue magpie	<i>Urocissa erythrorhyncha</i>	LC	0	x	0	x	x	x	0	0	2,1,3,6,8
340	Red-billed scimitar-babbler	<i>Pomatorhinus ochraceiceps</i>	LC	0	x	x	x	x	x	0	0	2,1,3,6,8,9
341	Red-breasted parakeet	<i>Psittacula alexandri</i>	NT	0	0	0	x	x	x	x	x	1,3,6,8,9,14,7
342	Red-collared woodpecker	<i>Picus rabieri</i>	NT	0	x		x	x	x	x	x	2,1,3,8,9,14,7
343	Red-headed trogon	<i>Harpactes erythrocephalus</i>	LC	0	x	x	x	0	x	0	x	2,5,9,1,3,8,7

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
344	Red-rumped swallow	<i>Cecropis daurica</i>	LC	0	x	0	x	x	x	0	0	2,1,3,6,9
345	Red-tailed laughingthrush	<i>Trochalopteron milnei</i>	LC	0	0	0	x	x	x	0	0	1,3,8
346	Red-tailed minla	<i>Minla ignotincta</i>	LC	0	0	0	0	0	x	0	0	1,3,8
347	Red-throated flycatcher	<i>Ficedula parva</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,14
348	Red-throated pipit	<i>Anthus cervinus</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
349	Red-vented barbet	<i>Psilopogon lagrandieri</i>	LC	0	x	x	0	0	x	0	0	2,9,1,3
350	Red-wattled lapwing	<i>Vanellus indicus</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
351	Red-whiskered bulbul	<i>Pycnonotus jocosus</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,14,7
352	Richard's pipit	<i>Anthus richardi</i>	LC	0	0	0	x	0	x	0	x	1,3,8,9,7
353	River lapwing	<i>Vanellus duvaucelii</i>	NT	0	x	0	0	0	0	0	0	2
354	Ruby-cheeked sunbird	<i>Chalcoparia singalensis</i>	LC	0	x	0	x	0	x	x	x	2,1,3,8,14,7
355	Ruddy kingfisher	<i>Halcyon coromanda</i>	LC	0	x	x	x	0	x	0	x	2,5,9,1,3,8,7
356	Rufescent prinia	<i>Prinia rufescens</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,14,7
357	Rufous woodpecker	<i>Micropternus brachyurus</i>	LC	x	0	0	0	0	x	0	0	1,3,6,8
358	Rufous-backed sibia	<i>Leioptila annectans</i>	LC	0	0	0	x	x	0	0	0	1

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
359	Rufous-bellied eagle	<i>Lophotriorchis kienerii</i>	LC	0	0	x	x	x	x	x	0	5,1,3,8,9,14
360	Rufous-bellied niltava	<i>Niltava sundara</i>	LC	0	0	0	0	0	x	x	0	1,4
361	Rufous-chested flycatcher	<i>Ficedula dumetoria</i>	LC	0	x	0	0	0	0	0	0	2
362	Rufous-faced warbler	<i>Abroscopus albogularis</i>	LC	0	x	0	x	x	x	0	0	1,3,6,8
363	Rufous-fronted babbler	<i>Cyanoderma rufifrons</i>	LC	x	0	0	0	x	x	x	0	1,14
364	Rufous-necked hornbill	<i>Aceros nipalensis</i>	VU	0	x	0	x	x	x	x	x	2,9,1,3,6,8,4,14,7
365	Rufous-tailed robin	<i>Luscinia sibilans</i>	LC	0	x	x	x	x	x	x	0	2,5,1,38,9,14
366	Rufous-throated fulvetta	<i>Schoeniparus rufogularis</i>	LC	0	x	0	x	x	x	x	0	2,1,3,8,9,14
367	Rufous-throated partridge	<i>Arborophila rufogularis</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
368	Rufous-winged buzzard	<i>Butastur liventer</i>	LC	x	0	0	0	0	0	x	x	14,7
369	Rufous-winged fulvetta	<i>Schoeniparus castaneiceps</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
370	Rusty-capped fulvetta	<i>Schoeniparus dubia</i>	LC	0	0	0	0	0	x	0	0	1,8
371	Rusty-naped pitta	<i>Pitta oatesi</i>	LC	0	0	0	0	0	x	0	0	1,3,8
372	Sapphire flycatcher	<i>Ficedula sapphira</i>	LC	0	0	0	0	0	x	0	0	1
373	Scaly thrush	<i>Zoothera dauma</i>	LC	0	x	x	x	0	x	x	x	2,5,1,3,8,9,14,7

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No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
374	Scaly-breasted munia	<i>Lonchura punctulata</i>	LC	x	x	0	0	x	x	0	0	2,1,6
375	Scaly-breasted partridge	<i>Arborophila chloropus</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,8,4,14,7
376	Scaly-crowned babbler	<i>Malacopteron cinereum</i>	LC	0	x	x	0	0	x	x	x	2,1,3,8,4,14,7
377	Scarlet minivet	<i>Pericrocotus flammeus</i>	LC	0	x	x	x	x	x	x	0	2,9,5,1,36,8,4,14
378	Scarlet-backed flowerpecker	<i>Dicaeum cruentatum</i>	LC	0	0	0	x	x	x	0	x	1,3,8,7
379	Schrenck's bittern	<i>Ixobrychus eurhythmus</i>	LC	0	0	0	0	x	0	0	0	1
380	Shikra	<i>Accipiter badius</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,14,7
381	Short-billed minivet	<i>Pericrocotus brevirostris</i>	LC	0	0	0	0	x	x	0	0	1,3,8
382	Short-tailed scimitar-babbler	<i>Jabouilleia danjoui</i>	NT	0	0	0	0	x	x	0	0	1,3,8
383	Siamese fireback	<i>Lophura diardi</i>	LC	x	x	x	x	0	x	x	x	2,1,3,8,4,14,7
384	Siberian blue robin	<i>Lavivora cyane</i>	LC	x	x	x	x	x	x	0	x	2,5,13,8,7
385	Siberian rubythroat	<i>Calliope calliope</i>	LC	x	x	0	x	0	x	0	0	2,1,3,9
386	Siberian thrush	<i>Geokichla sibirica</i>	LC	0	x	0	0	0	x	x	x	2,1,3,8,14,7
387	Silver pheasant	<i>Lophura nycthemera</i>	LC	x	x	0	x	x	x	x	0	2,9,1,3,6,8,4,14
388	Silver-backed needletail	<i>Hirundapus cochinchinensis</i>	LC	0	x	0	x	x	x	0	0	2,1,3,6

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
389	Silver-breasted broadbill	<i>Serilophus lunatus</i>	LC	0	x	x	x	x	x	x	x	2,9,1,3,8,4,14,7
390	Silver-eared mesia	<i>Leiothrix argentauris</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
391	Slaty-backed flycatcher	<i>Ficedula erithacus</i>	LC	x	0	0	0	0	0	0	0	
392	Slaty-backed forktail	<i>Enicurus schistaceus</i>	LC	0	x	0	x	x	x	x	0	2,1,3,6,8,914
393	Slaty-bellied tesia	<i>Tesia olivea</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
394	Small minivet	<i>Pericrocotus cinnamomeus</i>	LC	0	0	0	x	x	x	0	0	1,3,8,9
395	Small niltava	<i>Niltava macgrigoriae</i>	LC	0	x	0	x	x	x	0	0	2,1,3,6,8
396	Snowy-browed flycatcher	<i>Ficedula hyperythra</i>	LC	0	x	0	0	0	x	0	0	2,1,3,8
397	Sooty babbler	<i>Stachyris herbeti</i>	LC	0	0	x	0	0	0	x	0	2,5,9,14,4
398	Sooty-headed bulbul	<i>Pycnonotus aurigaster</i>	LC	0	0	0	x	0	x	0	0	1,3,8,9
399	Speckled piculet	<i>Picumnus innominatus</i>	LC	0	0	0	x	0	x	0	x	3,8,7
400	Spectacled fulvetta	<i>Fulvetta ruficapilla</i>	LC	0	0	0	0	0	x	0	0	1,3,8
401	Spot-bellied eagle-owl	<i>Bubo nipalensis</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
402	Spot-billed pelican	<i>Pelecanus philippensis</i>	NT	0	0	0	0	0	0	x	0	14
403	Spot-necked babbler	<i>Stachyris striolata</i>	LC	0	x	0	x	x	x	x	0	2,1,3,6,8,14

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
404	Spotted owlet	<i>Athene brama</i>	LC	x	x	x	x	x	x	x	x	2,9,5,1,3,6,8,4,14,7
405	Spotted redshank	<i>Tringa erythropus</i>	LC	0	0	0	x	0	x	0	x	1,3,8,9,7
406	Spotted wren babbler	<i>Spelaeoris formosus</i>	LC	0	0	0	0	x	0	0	0	1,8
407	Spot-throated babbler	<i>Pellorneum albiventre</i>	LC	0	0	0	x	x	0	0	0	1
408	Square-tailed drongo-cuckoo	<i>Surniculus lugubris</i>	LC	0	x	0	0	0	0	0	0	2
409	Stork-billed kingfisher	<i>Pelargopsis capensis</i>	LC	0	x	x	x	0	x	x	x	2,9,1,8,14,7
410	Streak-breasted scimitar babbler	<i>Pomatorhinus ruficollis</i>	LC	0	0	0	0	x	x	0	0	1,3
411	Streak-eared bulbul	<i>Pycnonotus blanfordi</i>	LC	x	0	0	0	0	0	0	x	7
412	Streaked spiderhunter	<i>Arachnothera magna</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
413	Streaked wren babbler	<i>Napothera brevicaudata</i>	LC	0	x	x	x	x	x	x	0	2,9,5,1,3,6,8,4,14
414	Striated bulbul	<i>Pycnonotus striatus</i>	LC	0	0	0	0	0	x	0	0	1
415	Striated swallow	<i>Hirundo striolata</i>	LC	0	x	0	0	0	0	x	x	2,14,7
416	Striated yuhina	<i>Yuhina castaniceps</i>	LC	0	x	0	x	x	x	x	0	2,1,3,6,8,9,4,14
417	Stripe-breasted woodpecker	<i>Dendrocopos atratus</i>	LC	0	0	0	0	0	0	x	0	14
418	Stripe-throated bulbul	<i>Pycnonotus finlaysoni</i>	LC	x	x	x	x	0	x	x	x	2,5,1,3,8,9,4,14,7

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
419	Stub-tailed bush-warbler	<i>Horornis squameiceps</i>	LC	0	0	x	0	0	x	x	0	5,3,4
420	Sulphur-breasted warbler	<i>Phylloscopus ricketti</i>	LC	0	x	0	0	x	x	0	0	2,1,3,8
421	Sultan tit	<i>Melanochlora sultanea</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
422	Swinhoe's minivet	<i>Pericrocotus cantonensis</i>	LC	0	0	0	0	x	x	0	0	1,9
423	Tawny fish owl	<i>Ketupa flavipes</i>	LC	0	0	0	0	x	0	0	0	1
424	Thick-billed flowerpecker	<i>Dicaeum agile</i>	LC	0	x	0	x	x	x	0	x	2,1,3,6,7
425	Thick-billed green pigeon	<i>Treron curvirostra</i>	LC	x	0	0	0	0	0	0	0	9
426	Thick-billed warbler	<i>Arundinax aedon</i>	LC	0	x	0	x	0	x	0	x	2,3,8,7
427	Tickell's blue flycatcher	<i>Cyornis tickelliae</i>	LC	0	0	0	x	0	x	0	0	8
428	Tickell's brown hornbill	<i>Anorrhinus tickelli</i>	NT	0	x	0	0	x	x	x		2,1,3,6,8,4,14
429	Velvet-fronted nuthatch	<i>Sitta frontalis</i>	LC	0	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
430	Verditer flycatcher	<i>Eumyias thalassina</i>	LC	x	x	x	x	x	x	x		2,1,3,8,9,4,14
431	Vernal hanging-parrot	<i>Loriculus vernalis</i>	LC	x	0	0	x	0	x	x	x	1,3,8,9,14,7
432	Violet cuckoo	<i>Chrysococcyx xanthorhynchus</i>	LC	0	x	0	x	0	x	x	0	2,9,1,3,8,4,14
433	Wastern koel	<i>Eudynamys scolopaceus</i>	LC	0	x	0	x	x	x	x	x	2,9,1,3,6,8,14,7

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
434	Western marsh-harrier	<i>Circus aeruginosus</i>	LC	0	x	0	x	x	x	x	x	2,1,3,6,8,9,4,14,7
435	Western spectacled barwing	<i>Actinodura ramsayi</i>	LC	0	0	0	0	0	x	0	0	1,3,8
436	Western yellow wagtail	<i>Motacilla flava</i>	LC	0	0	0	x	0	x	0	x	1,3,8,9,7
437	Whiskered yuhina	<i>Yuhina flavicollis</i>	LC	0	0	0	0	0	x	0	0	1,3,8
438	White wagtail	<i>Motacilla alba</i>	LC	0	x	x	x	0	x	0	0	2,1,3,8,9
439	White-bellied green-pigeon	<i>Treron seiboldii</i>	LC	0	x	x	x	x	x	x	0	2,9,1,3,6,4,14
440	White-bellied yuhina	<i>Erpornis zantholeuca</i>	LC	0	x	x	x	x	x	x	x	2,9,5,1,36,8,4,14,7
441	White-breasted kingfisher	<i>Halcyon smyrnensis</i>	LC	0	0	0	0	x	0	0	x	1,7
442	White-breasted waterhen	<i>Amaurornis phoenicurus</i>	LC	x	x	0	x	x	x	0	x	2,1,3,6,8,9,7
443	White-browed piculet	<i>Sasia ochracea</i>	LC	0	x	0	x	x	x	0	0	2,1,3,6,8
444	White-browed scimitar-babbler	<i>Pomatorhinus schisticeps</i>	LC	x	x	0	0	x	x	x	x	2,1,3,6,8,9,14,7
445	White-browed shrike babbler	<i>Pteruthius flaviscapis</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
446	White-capped water-redstart	<i>Phoenicurus leucocephalus</i>	LC	0	0	0	0	x	x	0	0	1,8
447	White-crested laughingthrush	<i>Garrulax leucolophus</i>	LC	x	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
448	White-crowned forktail	<i>Enicurus leschenaulti</i>	LC	0	x	0		x	x	x	x	2,1,3,6,8,4,14,7

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
449	White-gorgeted flycatcher	<i>Ficedula monileger</i>	LC	0	0	0	0	x	x	0	0	1,3,8
450	White-hooded babbler	<i>Gampsorhynchus rufulus</i>	LC	0	0	x	x	x	x	0	0	5,9,1,3,6,8
451	White-rumped munia	<i>Lonchura striata</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,14,7
452	white-rumped shama	<i>Kittacincla malabaricus</i>	LC	x	x	x	x	x	x	x	x	2,5,9,1,3,6,8,4,14,7
453	White-shouldered starling	<i>Sturnus sinensis</i>	LC	0	0	0	0	0	x	x	0	3,8,14
454	White-tailed blue robin	<i>Myiomela leucura</i>	LC	0	x	0	x	x	x	0	0	2,1,3,8
455	White-tailed flycatcher	<i>Cyornis concretus</i>	LC	0	x	0	0	x	x	x	x	2,1,3,8,4,14,7
456	White-tailed leaf-warbler	<i>Phylloscopus intensor</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8
457	White-throated fantail	<i>Rhipidura albicollis</i>	LC	0	x	x	0	x	x	x	0	9,2,1,6,8,14
458	White-throated needletail	<i>Hirundapus caudacutus</i>	LC	0	0	0	0	0	0	x	0	14
459	White-throated rock-thrush	<i>Monticola gularis</i>	LC	x	x	x	0	x	x	0	0	2,5,1,6
460	White-winged duck	<i>Asarcornis scutulata</i>	EN	0	0	0	x	0	x	0	0	1,3,8,9
461	White-winged magpie	<i>Urocissa whiteheadi</i>	NT	0	0	0	x	x	x	x	0	2,1,3,6,8,9,4,14
462	Wire-tailed swallow	<i>Hirundo smithii</i>	VU	0	x	x	0	0	0	0	0	2
463	Wood sandpiper	<i>Tringa glareola</i>	LC	0	x	x	x	0	x	0	x	2,13,8,97

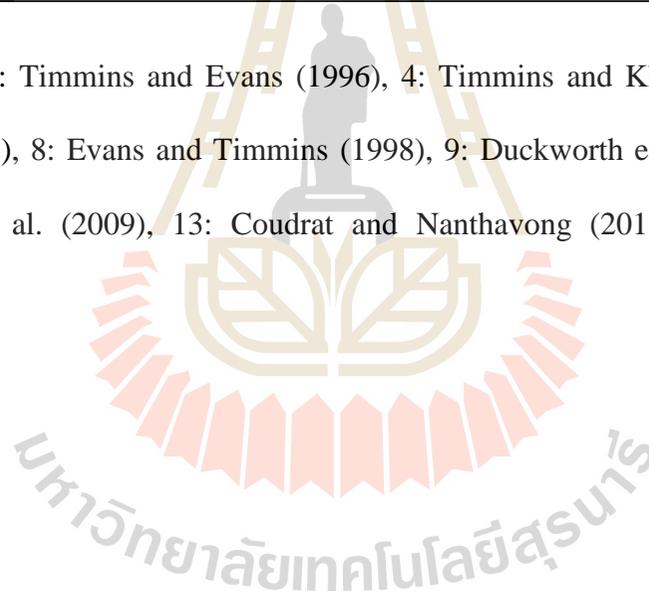
Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
464	Wood snipe	<i>Gallinago nemoricola</i>	VU	0	x	0	x	0	x	x	0	2,1,3,8,914
465	Wreathed hornbill	<i>Rhyticeros undulatus</i>	LC	0	0	0	0	x	x	x	0	1,3,8,14
466	Yellow-bellied prinia	<i>Prinia flaviventris</i>	LC	0	0	0	x	x	x	0	0	1,3,8
467	Yellow-bellied warbler	<i>Abroscopus superciliaris</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
468	Yellow-breasted bunting	<i>Emberiza aureola</i>	EN	0	0	0	x	x	x	0	0	1,3,8
469	Yellow-browed warbler	<i>Phylloscopus inornatus</i>	LC	0	x	x	x	x	x	x	x	2,5,1,3,6,8,9,4,14,7
470	Yellow-cheeked tit	<i>Melanochlora spilonotus</i>	LC	0	0	0	x	x	x	0	0	1,3,8
471	Yellow-eyed babbler	<i>Chrysomma sinense</i>	LC	0	0	0	0	x	0	0	0	1
472	Yellow-legged buttonquail	<i>Turnix tanki</i>	LC	x	x	0	x	x	x	x	0	2,1,3,8,4,14
473	Yellow-rumped flycatcher	<i>Ficedula zanthopygia</i>	LC	x	x	0	0	x	0	0	0	2,1
474	Yellow-throated fulvetta	<i>Schoenioparus cinerea</i>	LC	0	0	0	0	0	0	0	x	7
475	Yellow-vented flowerpecker	<i>Dicaeum chrysorrheum</i>	LC	0	x	0	x	0	x	x	0	2,1,3,8,914
476	Yellow-vented green-pigeon	<i>Treron seimundi</i>	LC	x	x	0	x	x	x	x	0	2,1,3,8,14
477	Yellow-vented warbler	<i>Phylloscopus cantator</i>	LC	0	0	0	x	x	x	0	0	1,3,6,8

Table 4.1 Checklist of birds in five National Biodiversity Conservation Areas nearby compared with this study. Conservation Status (CS), This study (TS), Nam Kading (NKD), Phou Hin Poun (PHP), Nakai-Nam Theun (NNT), Hin Namno (HNN), Phou Xang He (PXH), Zero (O) and Present (X) (Continued).

No	Common Name	Scientific Name	CS	TS	NKD	PHP	NP	NTX	NNT	HNN	PXH	References
478	Zitting cisticola	<i>Cisticola juncidis</i>	LC	0	0	0	0	0	x	0	0	1,3,8

1: Tobias (1997), 2: WCS (1995a), 3: Timmins and Evans (1996), 4: Timmins and Khounboline (1996), 5: Timmins (1997), 6: Tizard (1996), 7: Thewlis et al. (1995), 8: Evans and Timmins (1998), 9: Duckworth et al. (1998), 10: Alstrom et al. (2010), 11: Duckworth (2009), 12: Woxvold et al. (2009), 13: Coudrat and Nanthavong (2016) and 14: Walston and Vinton (1999).



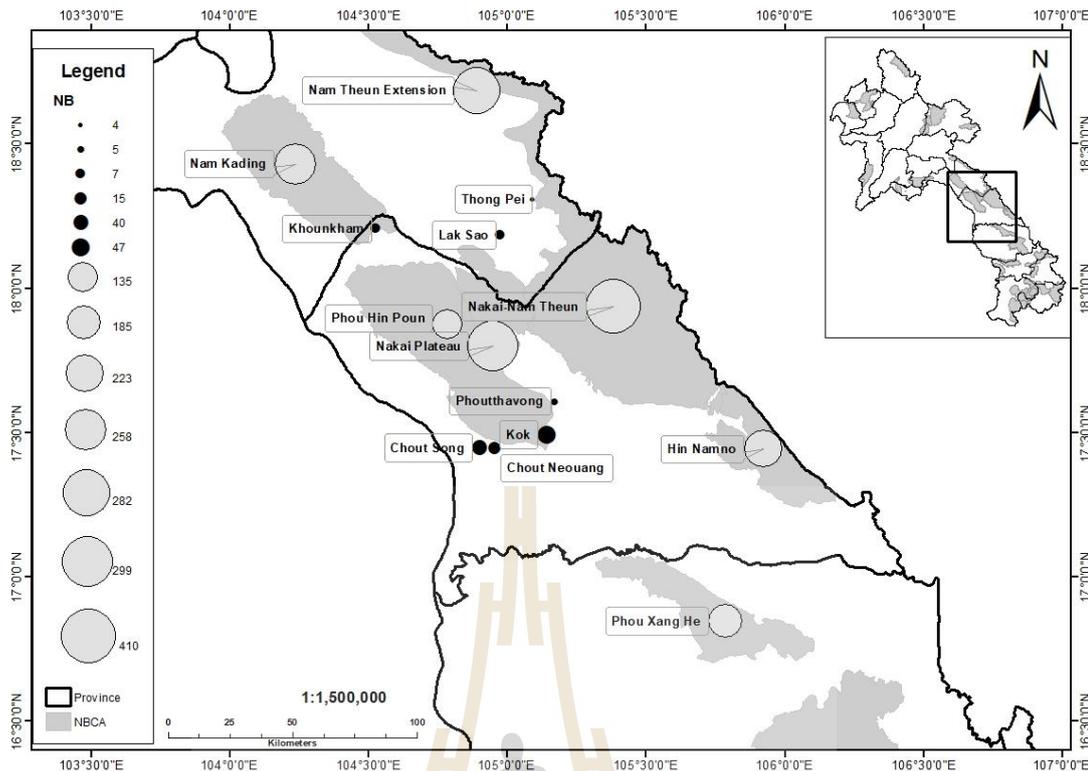


Figure 4.1 Hotspot of bird species found this study compare with NBCAs nearby.

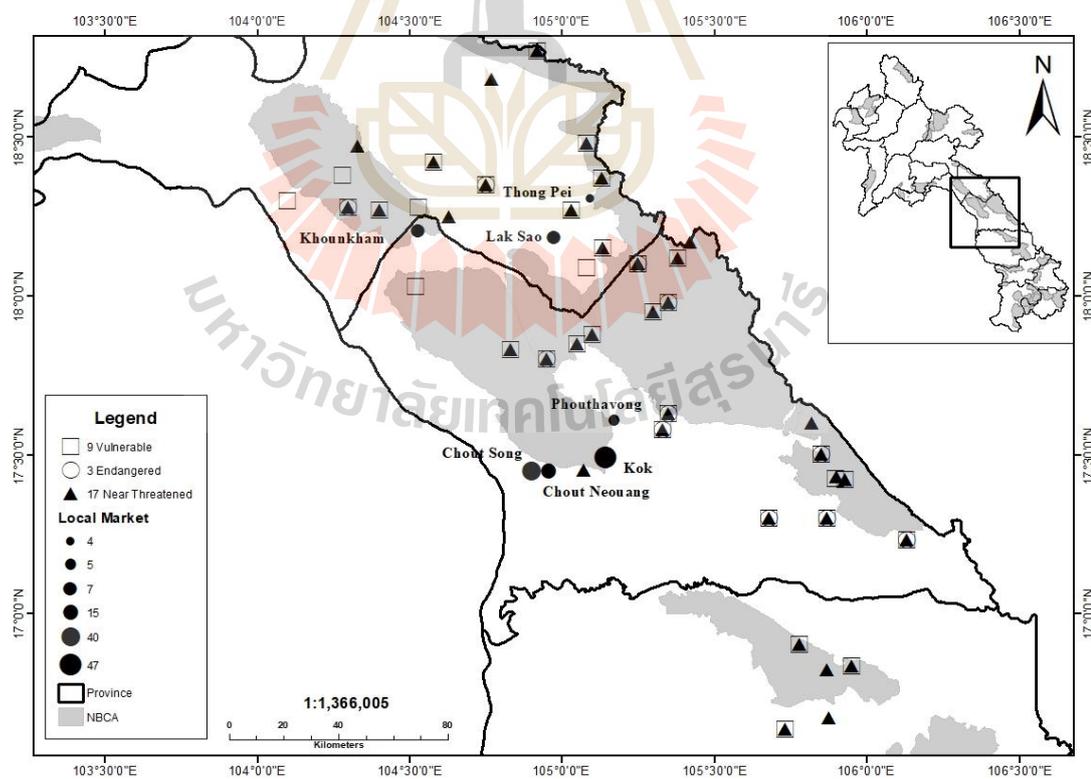


Figure 4.2 Hotspot of Endangered, Vuulnerable, and Near Threatened species near the study area.

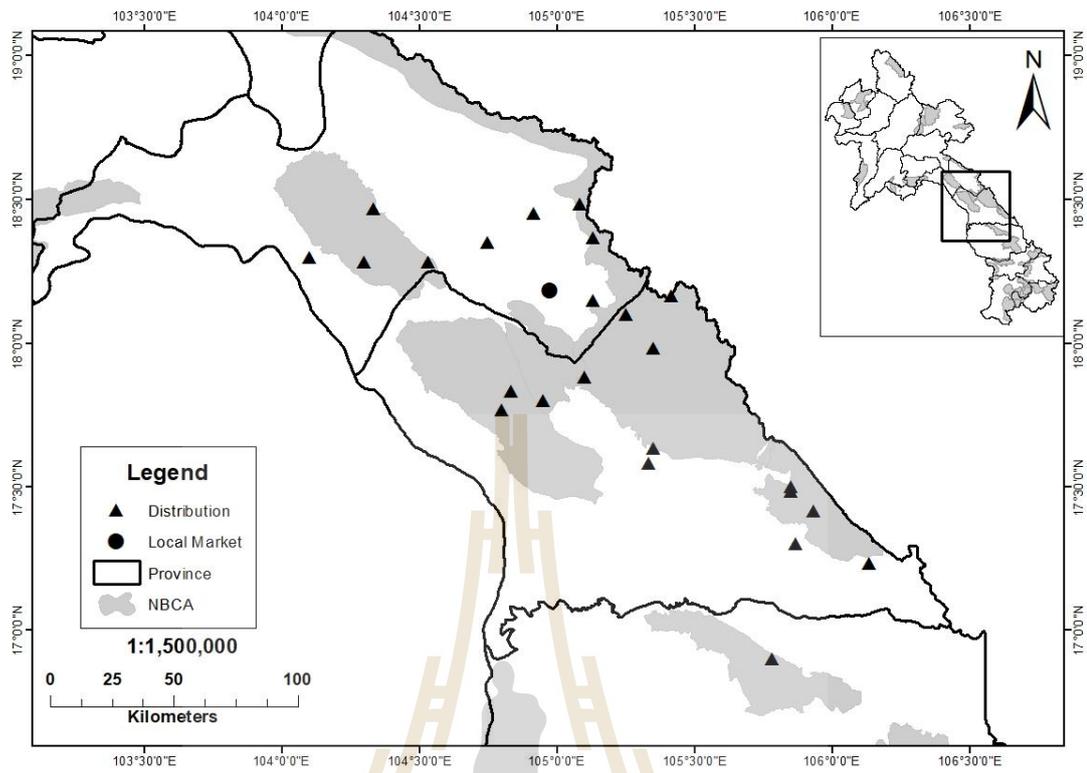


Figure 4.3 The distributions of scaly-breasted partridge.

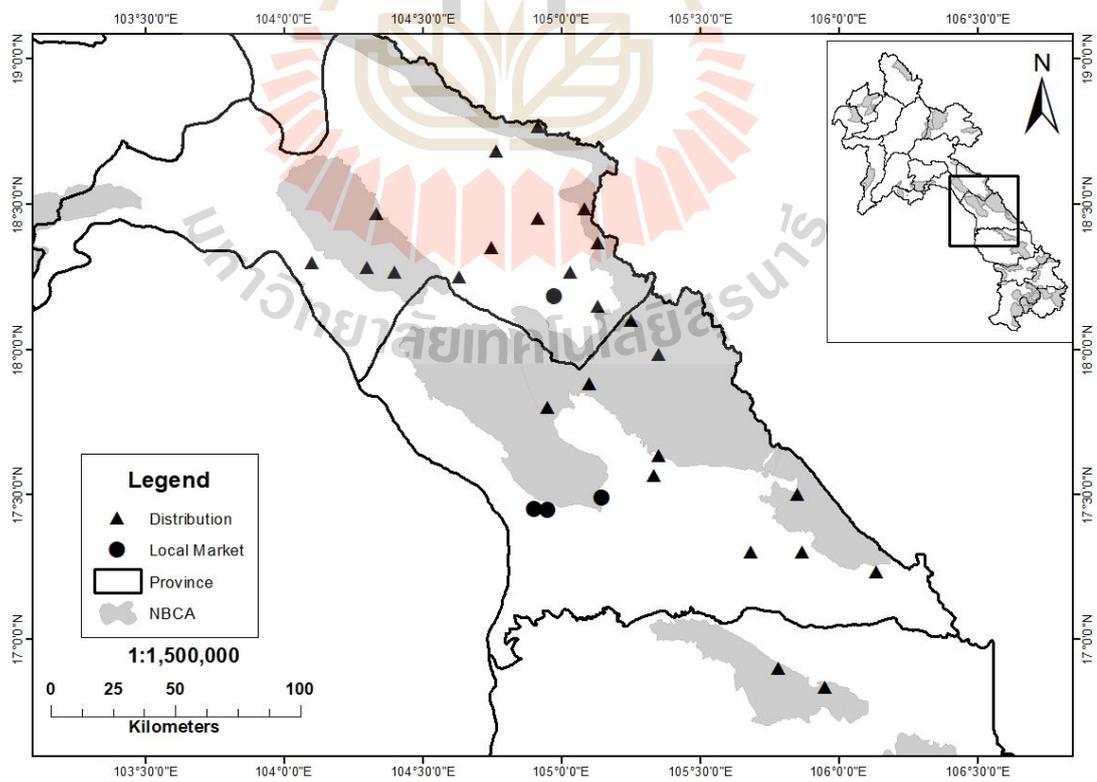


Figure 4.4 The distributions of red junglefowl.

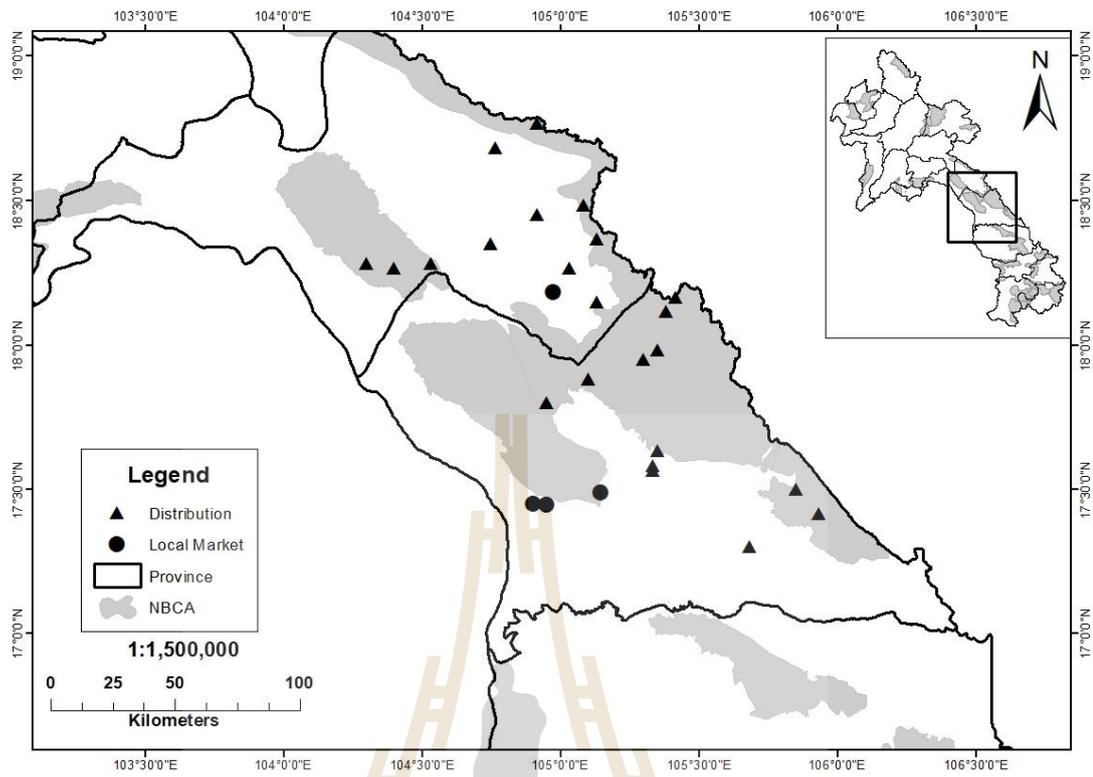


Figure 4.5 The distributions of silver pheasant.

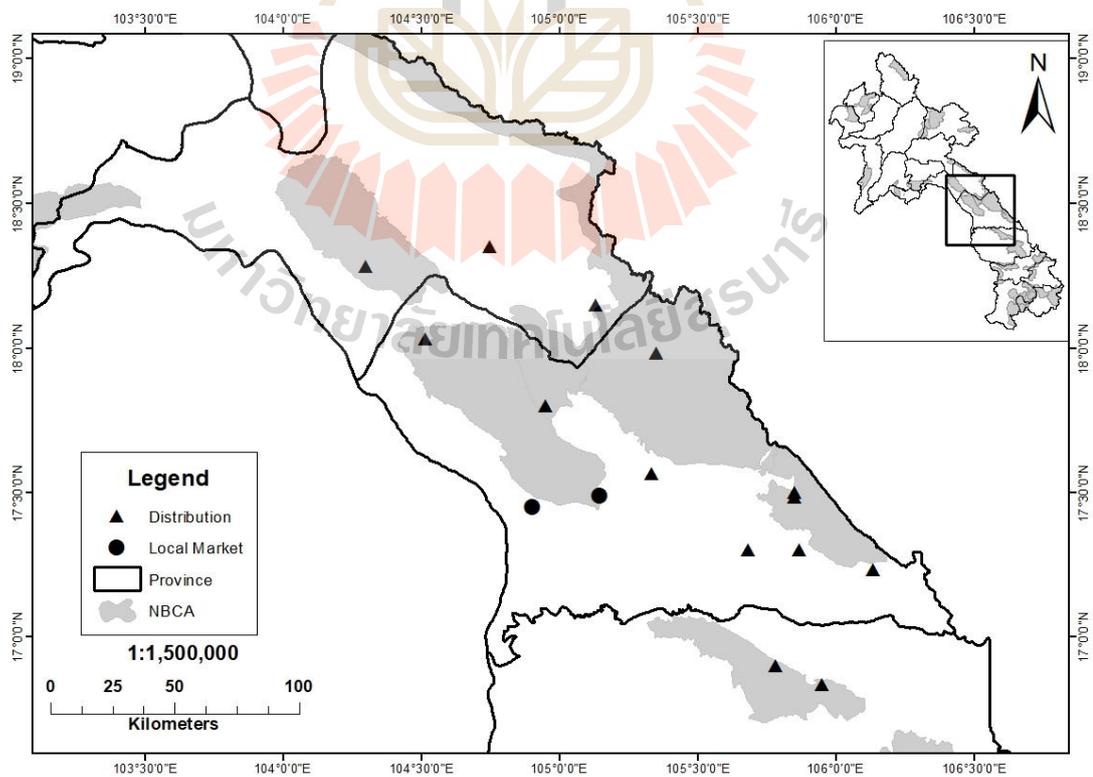


Figure 4.6 The distributions of Siamese fireback.

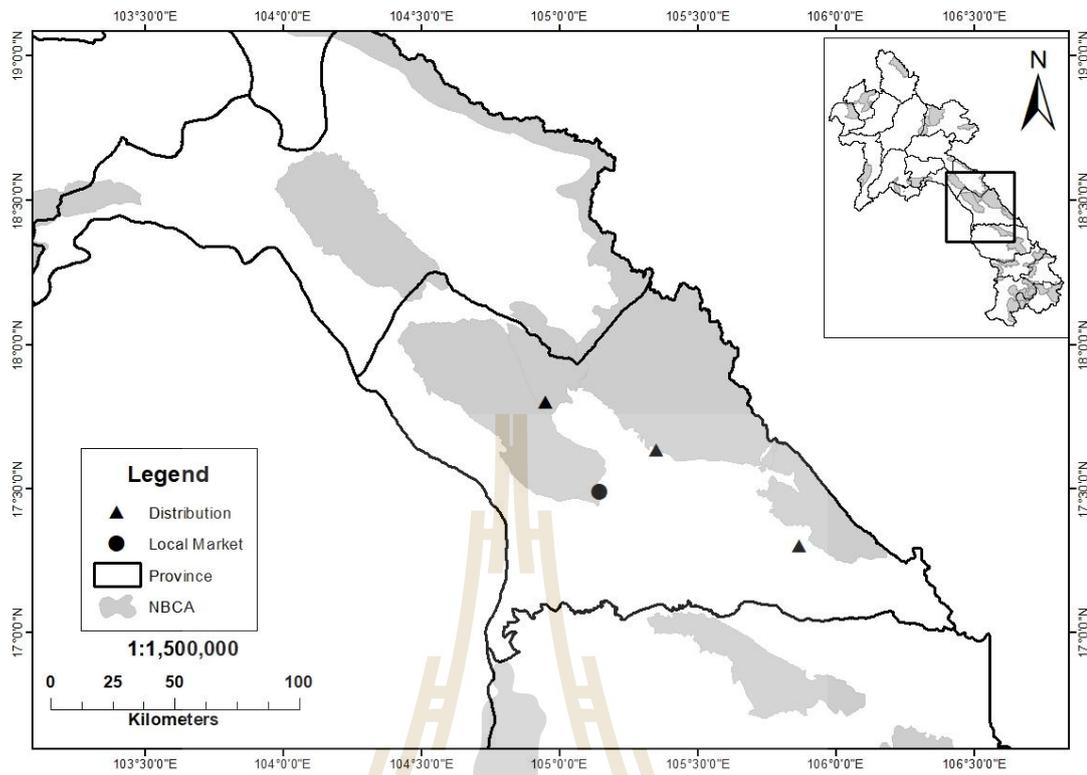


Figure 4.7 The distributions of lesser whistling-duck.

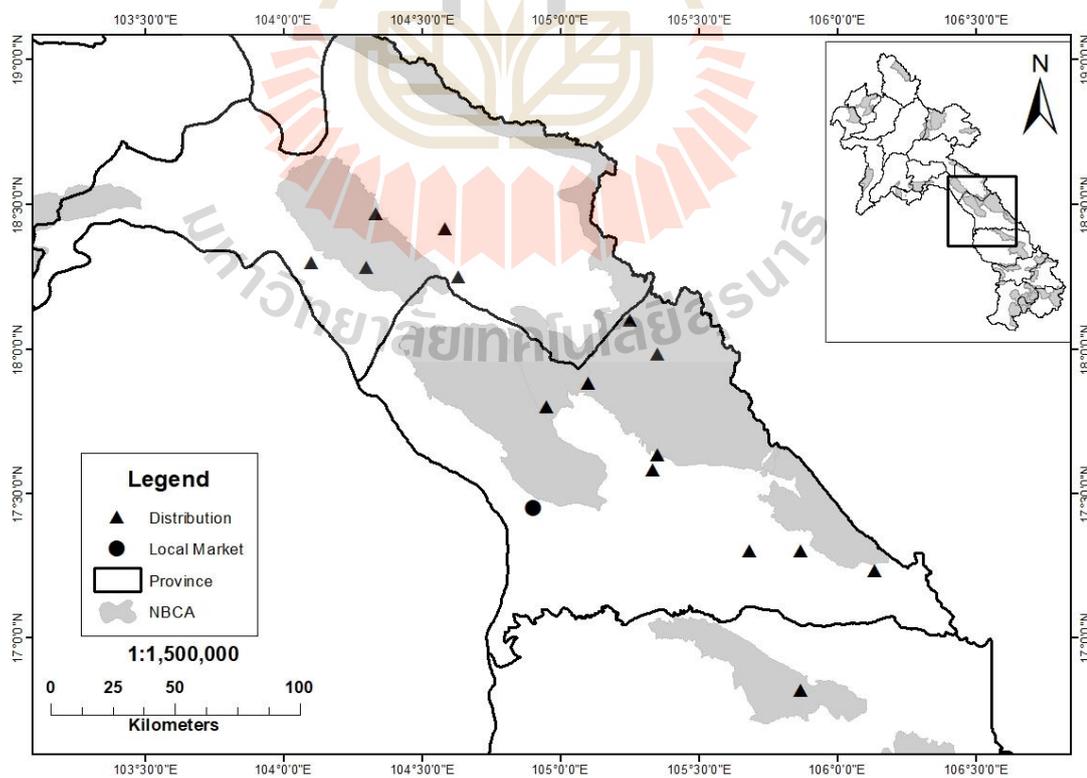


Figure 4.8 The distributions of chestnut-winged cuckoo.

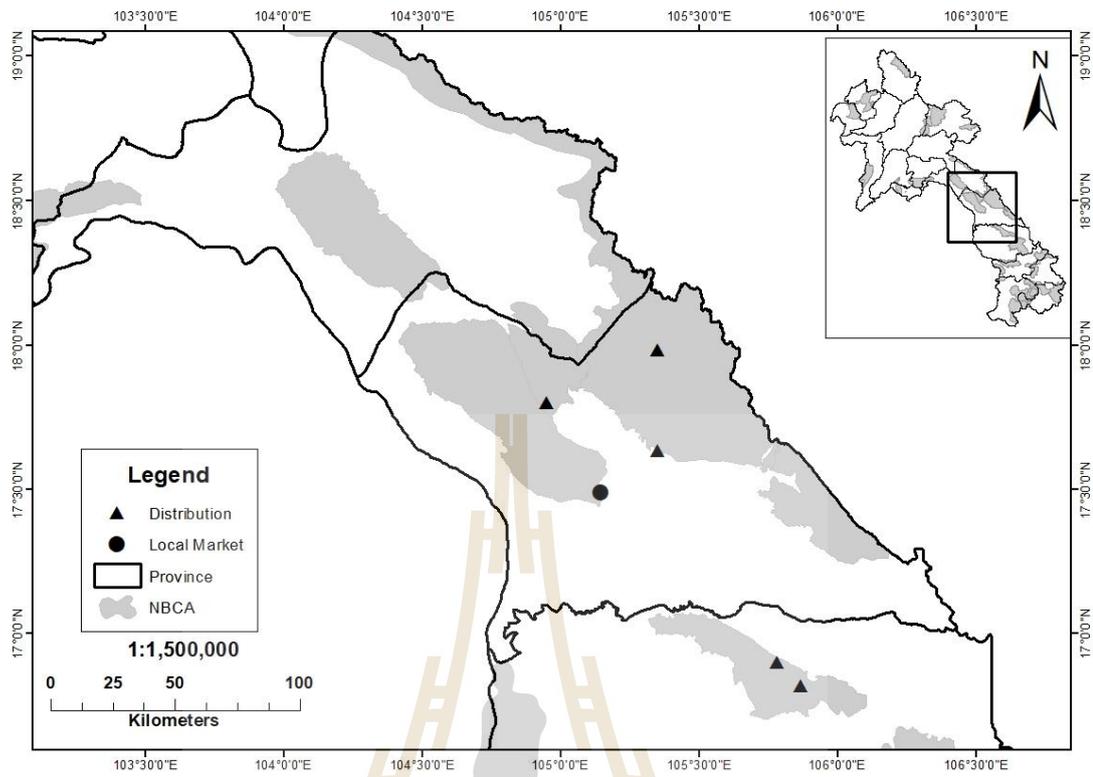


Figure 4.9 The distributions of green-billed malkoha.

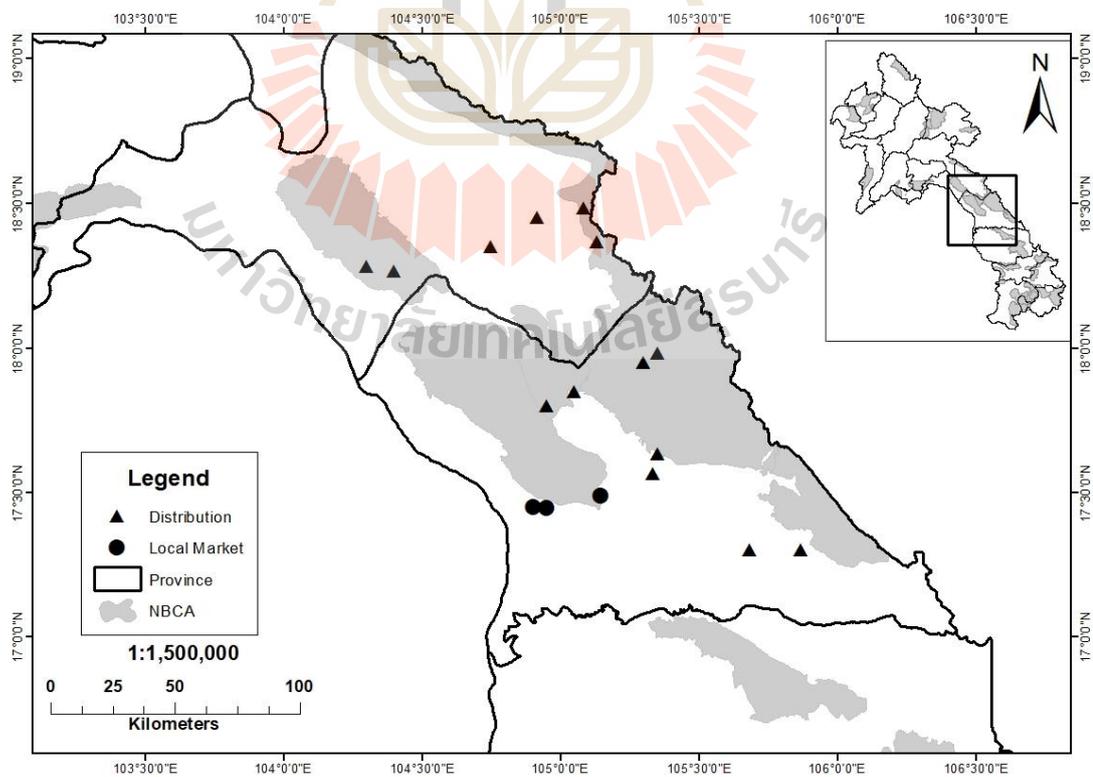


Figure 4.10 The distributions of greater coucal.

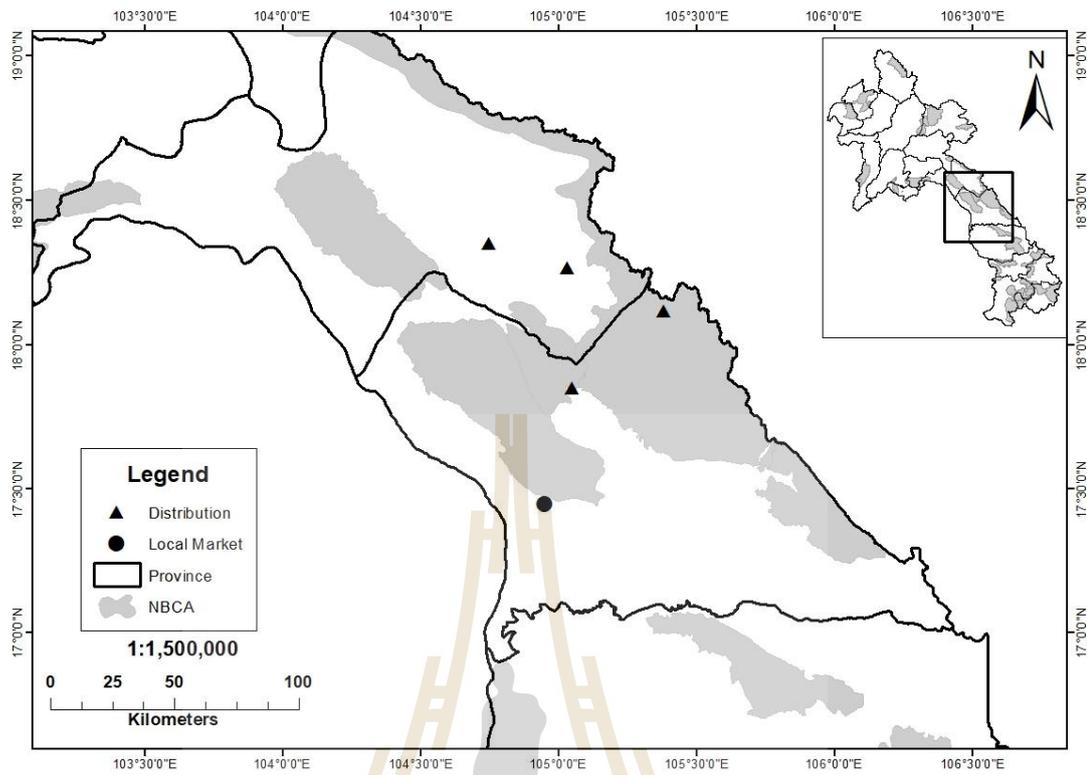


Figure 4.11 The distributions of rufous woodpecker.

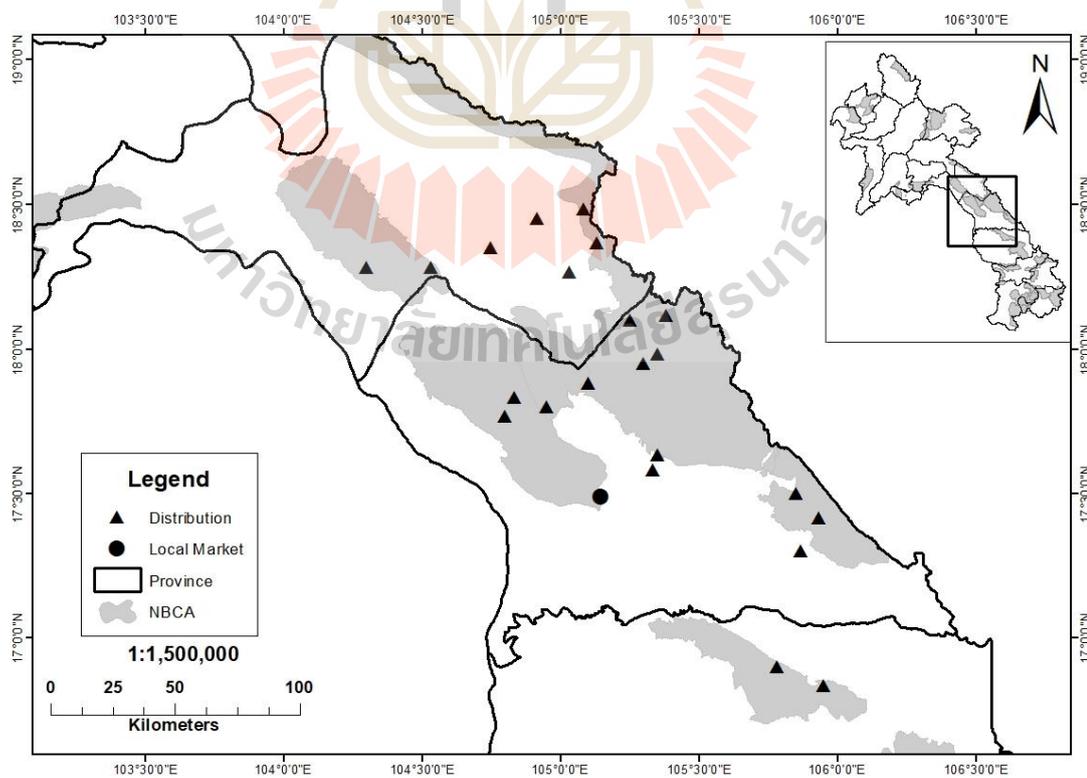


Figure 4.12 The distributions of greater yellownappe.

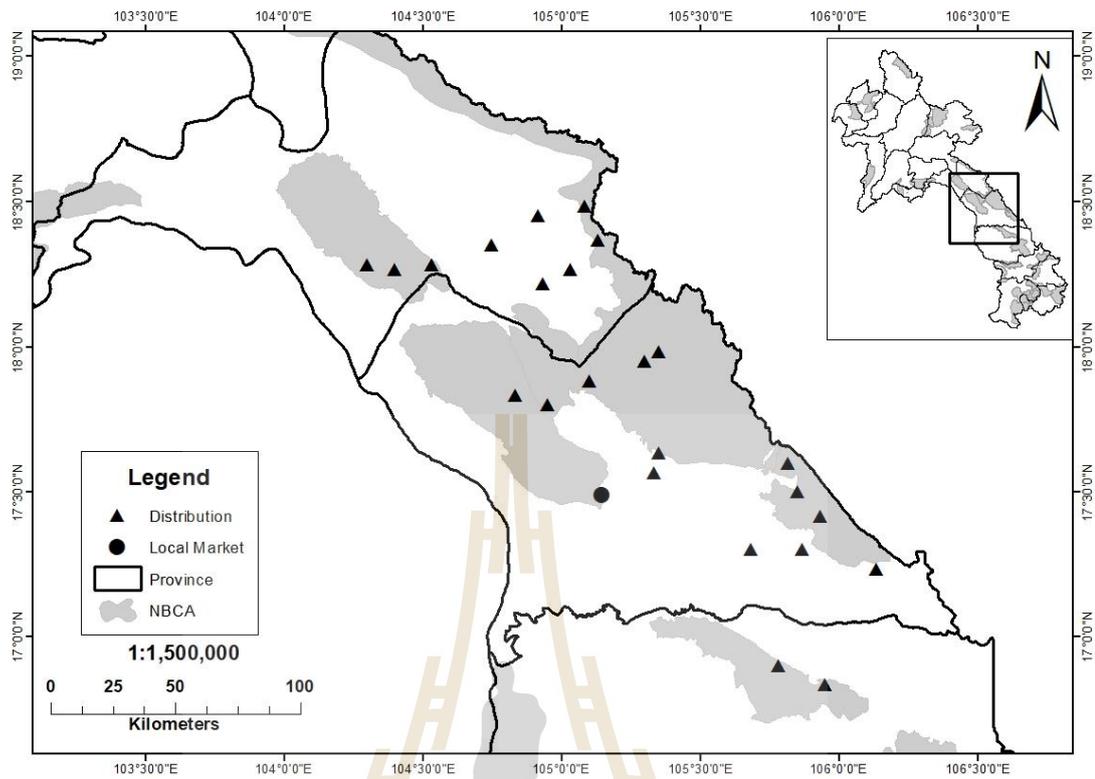


Figure 4.13 The distributions of laced woodpecker.

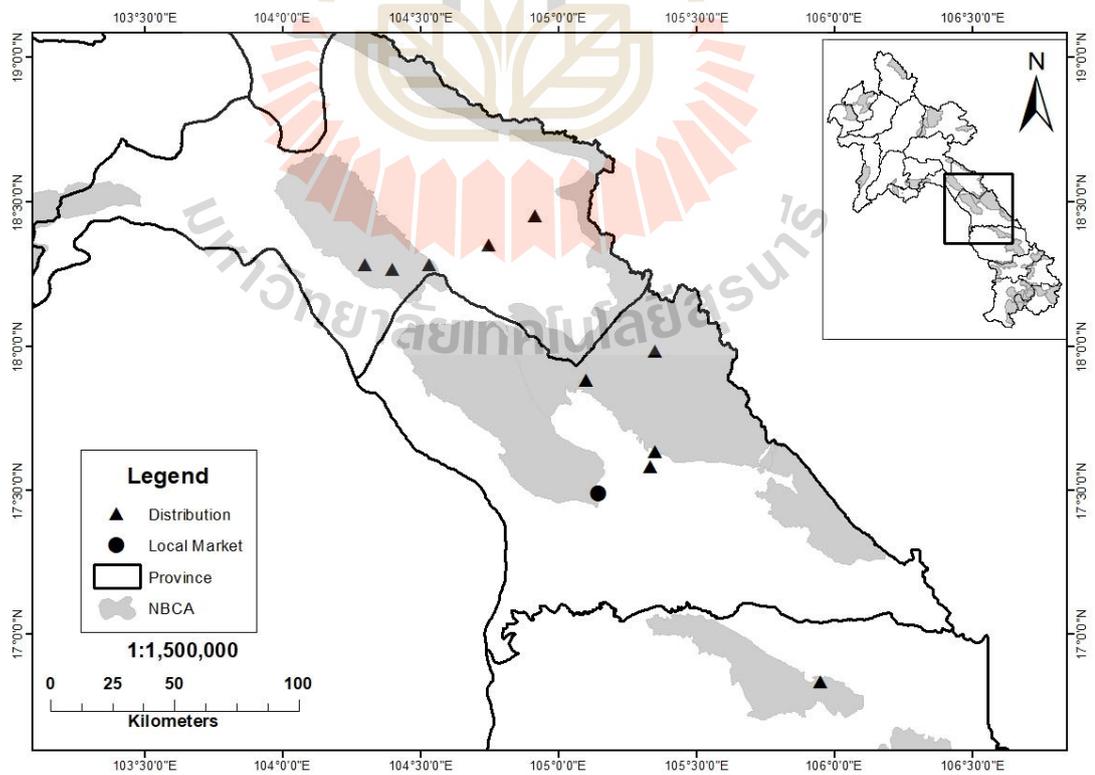


Figure 4.14 The distributions of bay woodpecker.

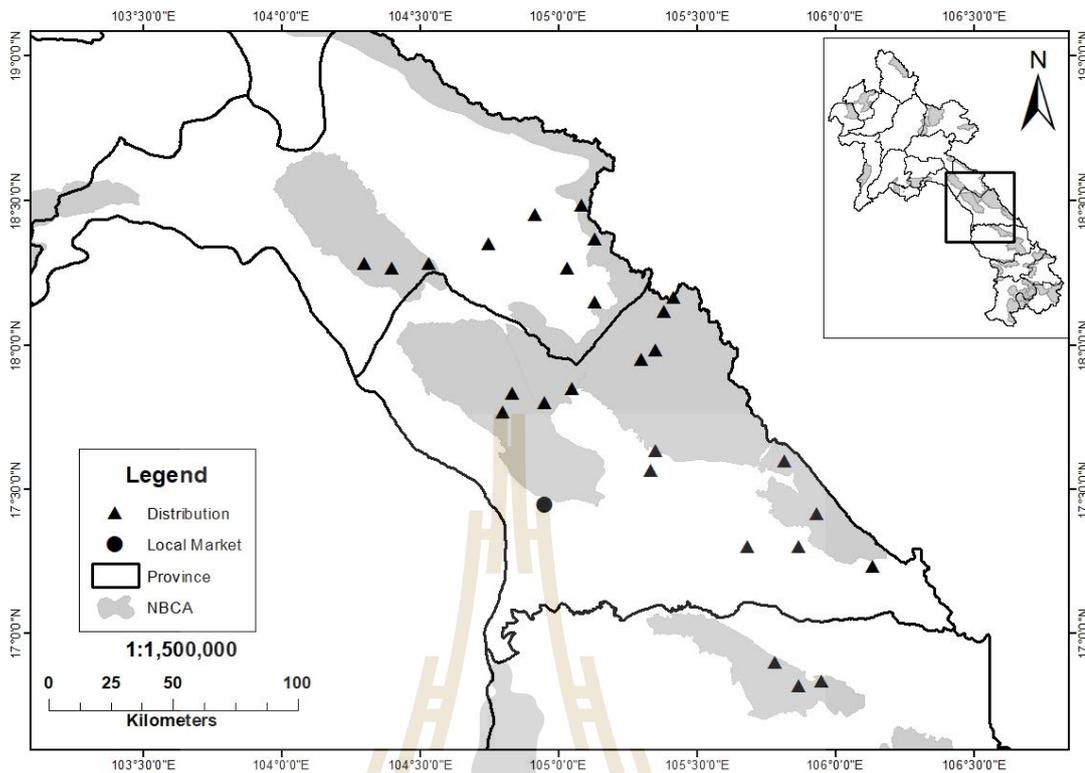


Figure 4.15 The distributions of linedate barbet.

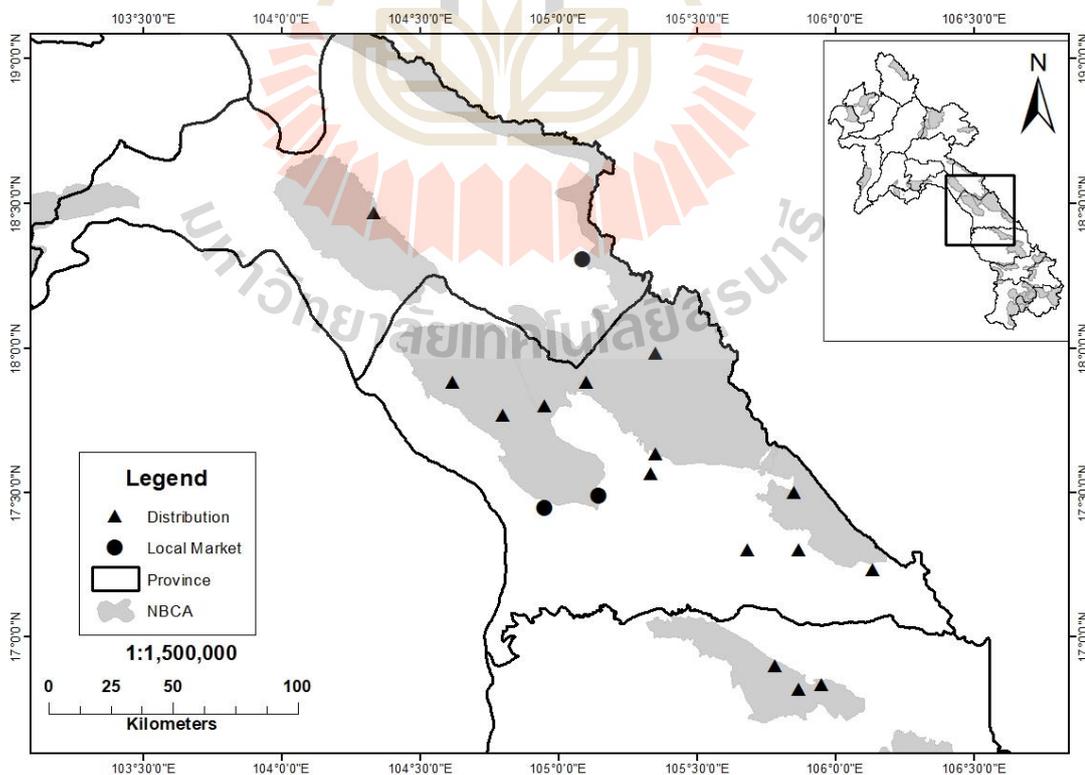


Figure 4.16 The distributions of green-eared barbet.

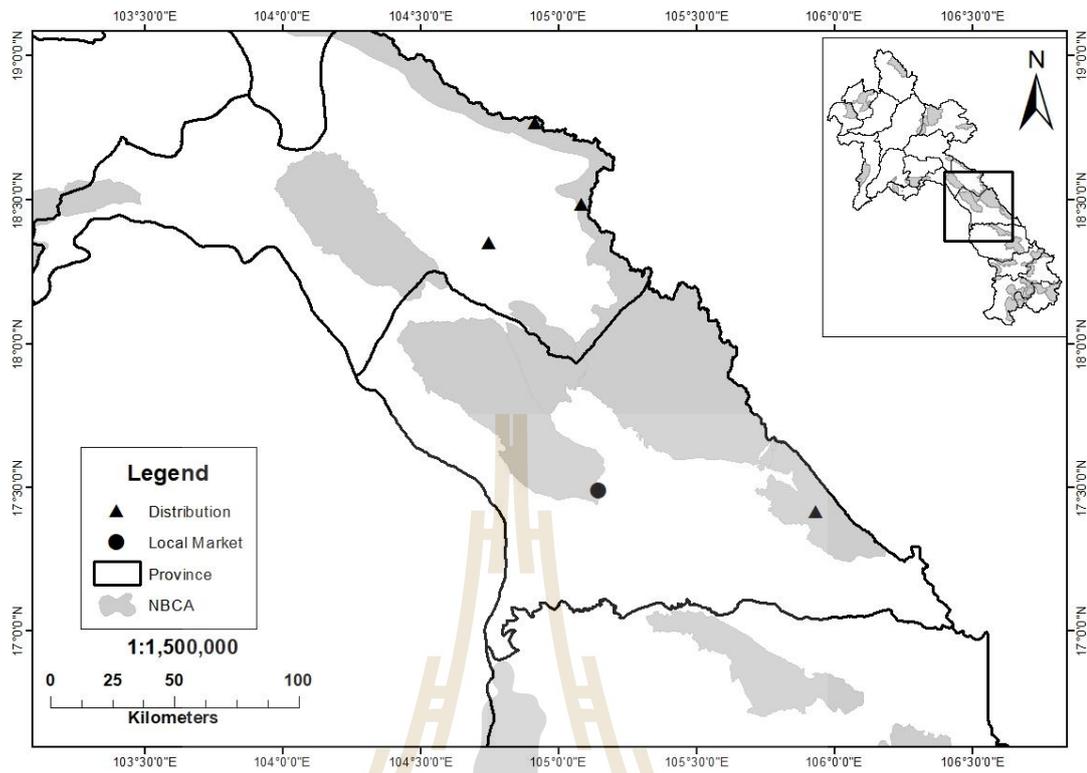


Figure 4.17 The distributions of moustached barbet.

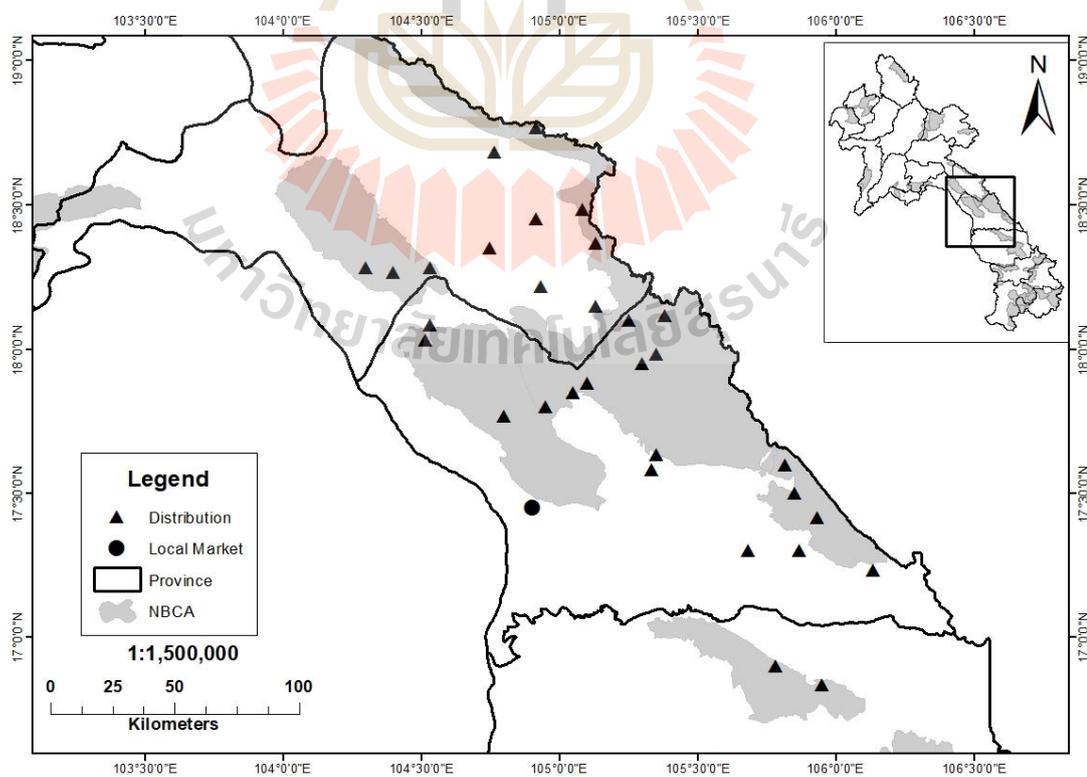


Figure 4.18 The distributions of Indian roller.

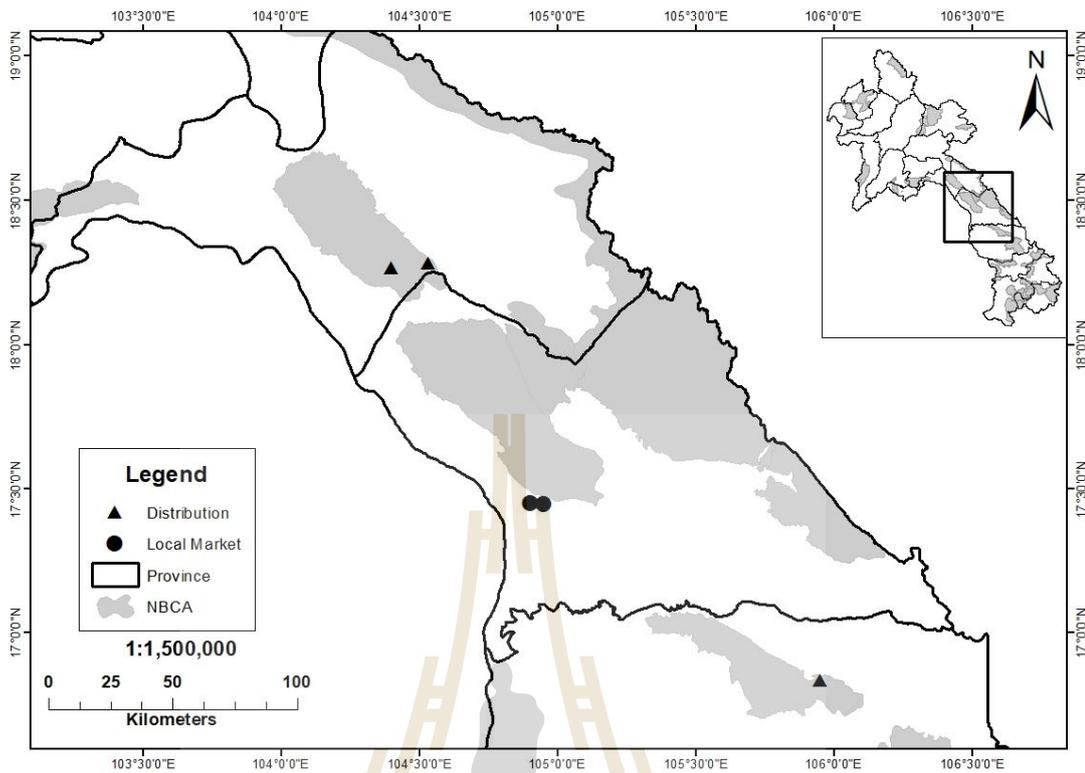


Figure 4.19 The distributions of banded kingfisher.

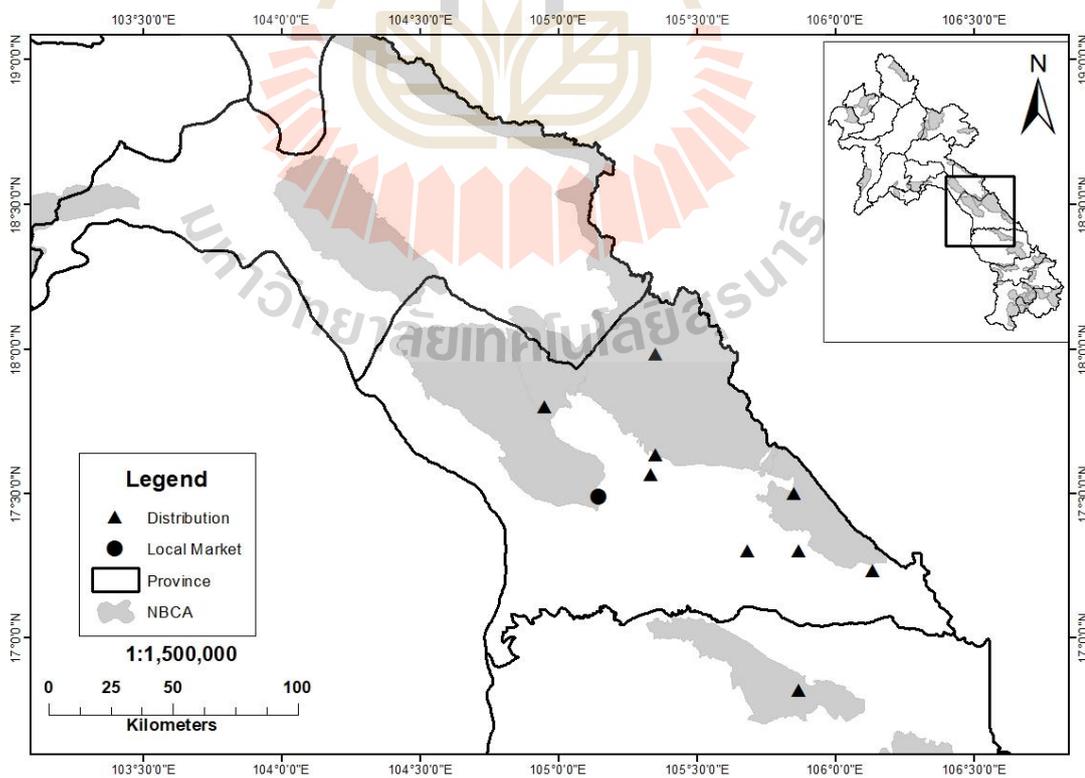


Figure 4.20 The distributions of vernal hanging-parrot.

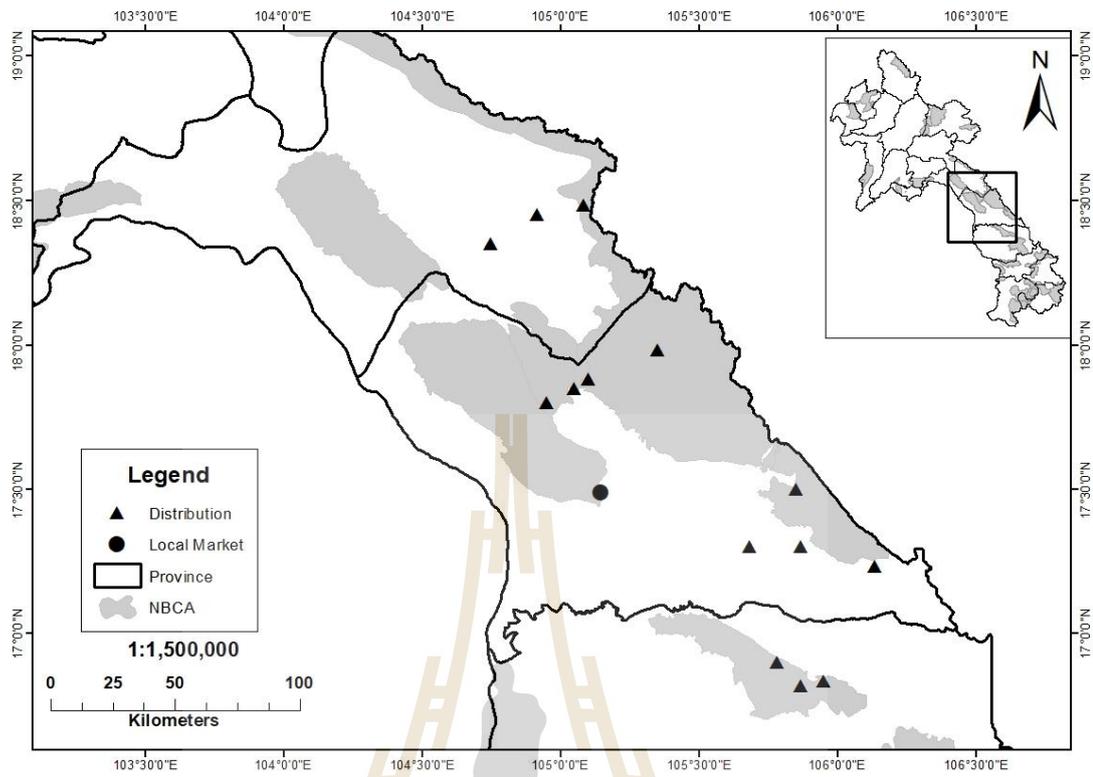


Figure 4.21 The distributions of oriental bay-owl.

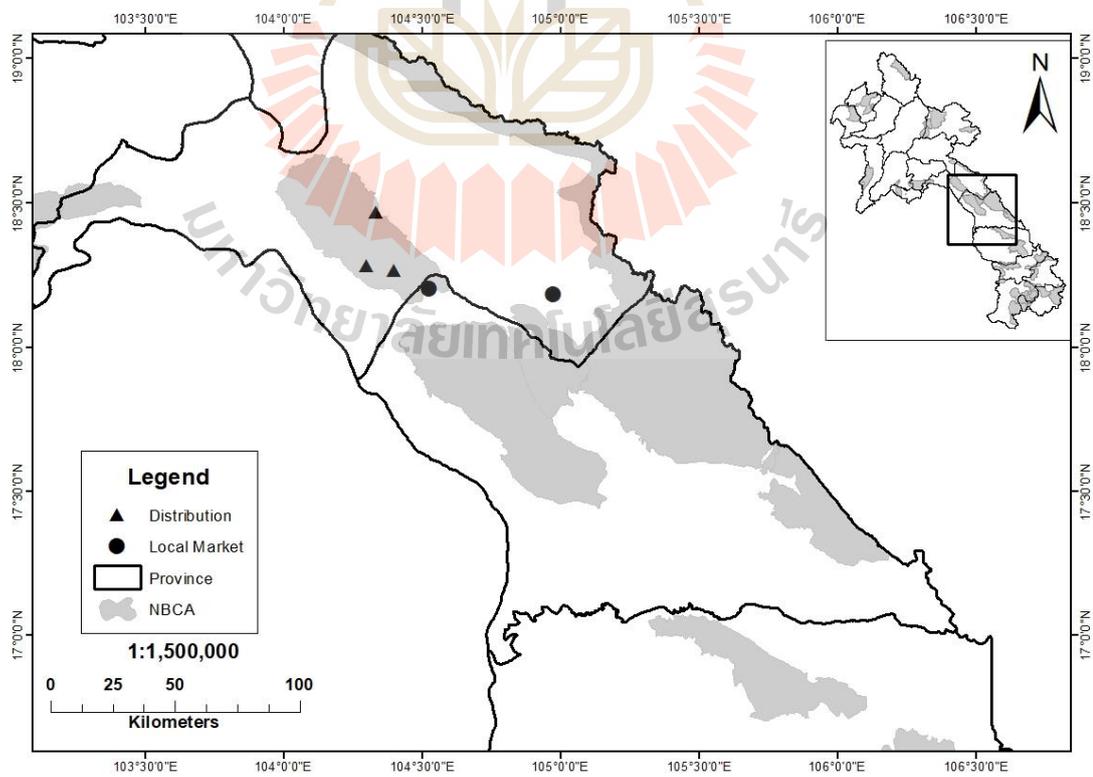


Figure 4.22 The distributions of oriental scops-owl.

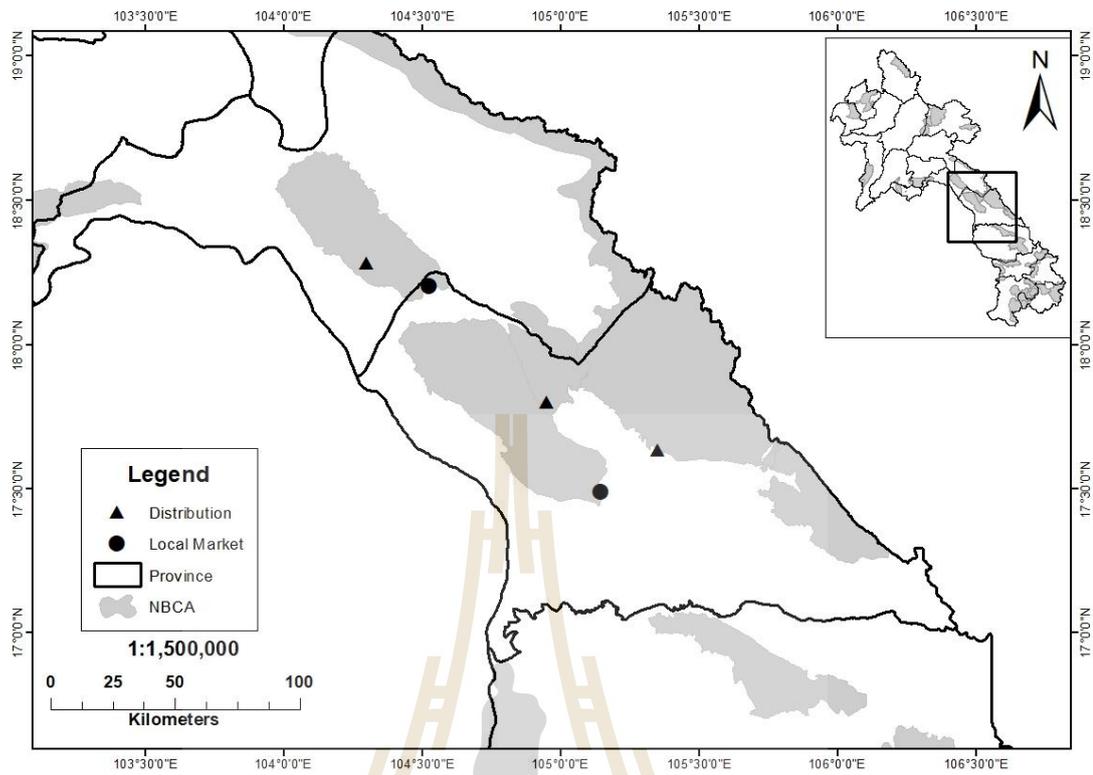


Figure 4.23 The distributions of collared scops-owl.

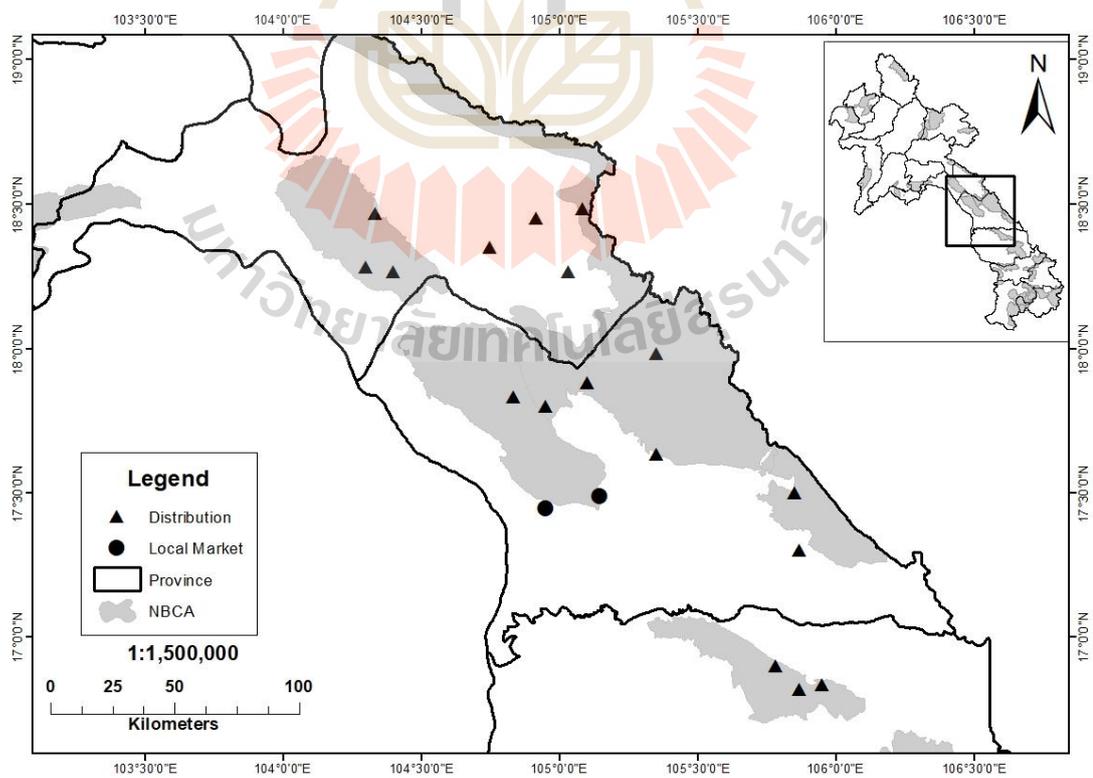


Figure 4.24 The distributions of collared owl.

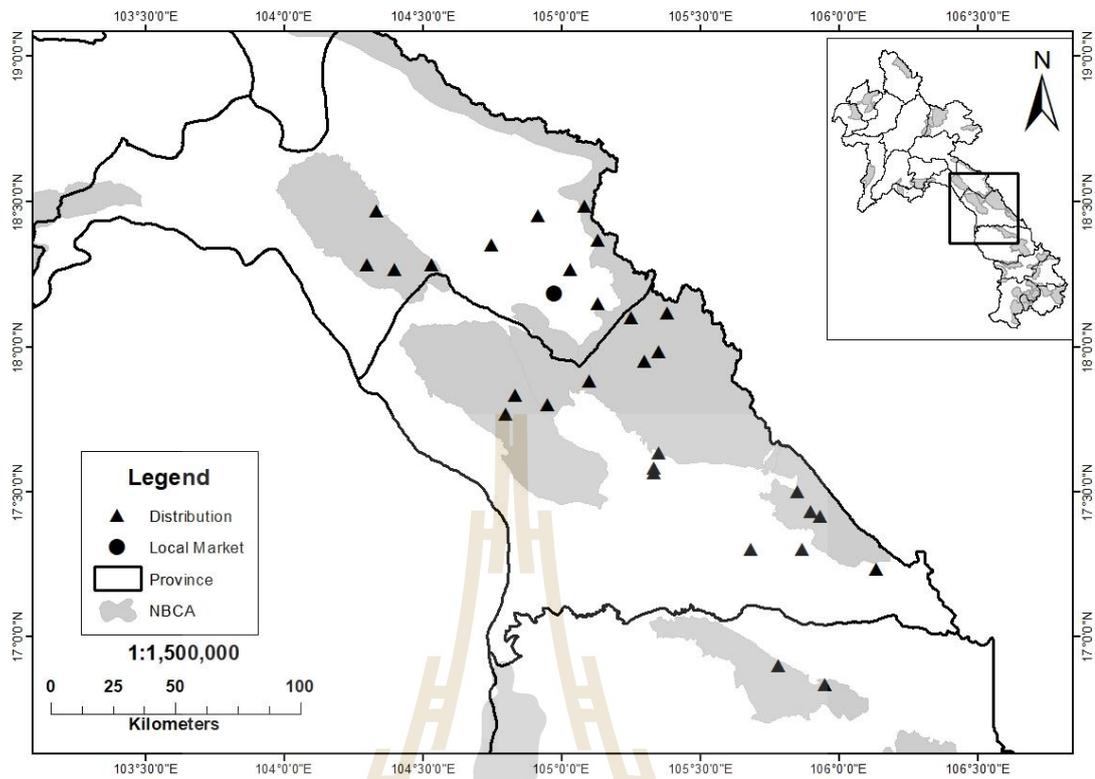


Figure 4.25 The distributions of Asian barred owlet.

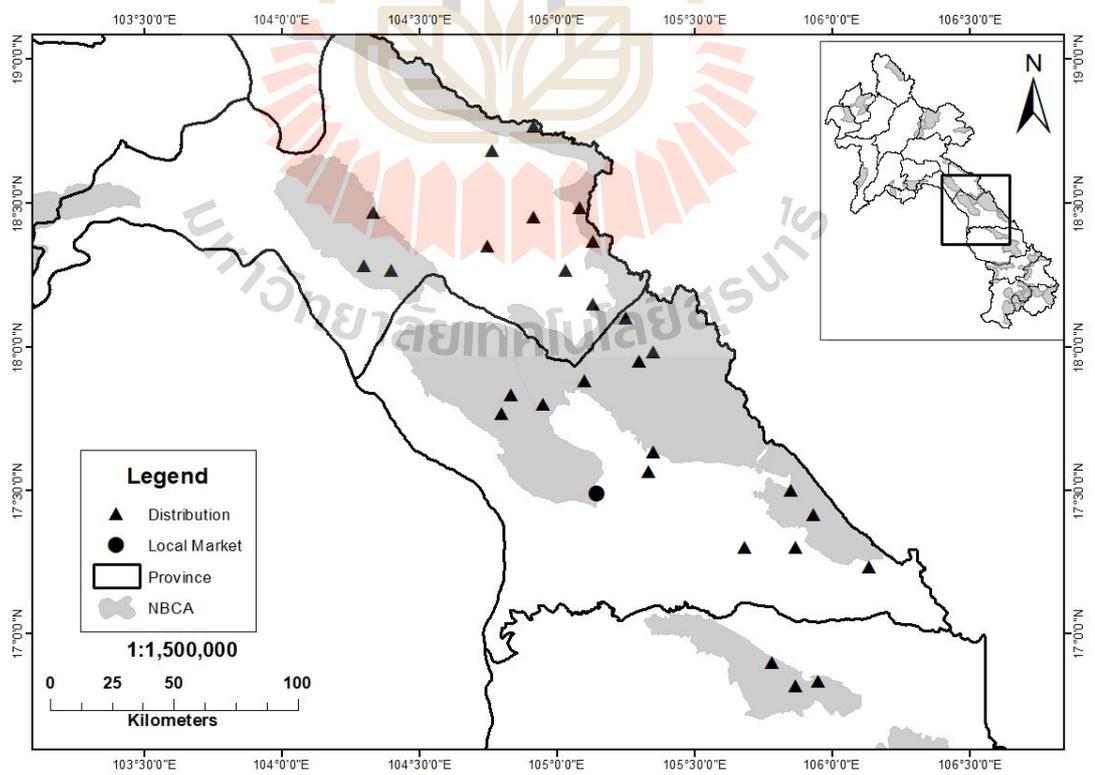


Figure 4.26 The distributions of spotted owlet.

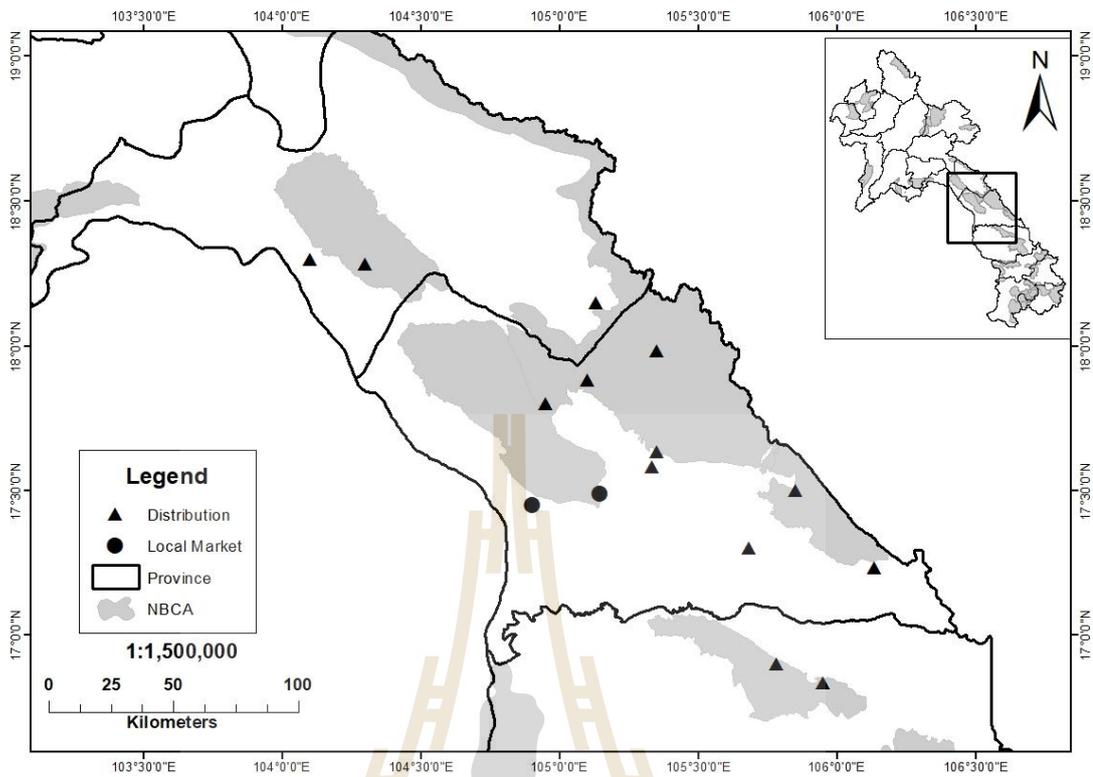


Figure 4.27 The distributions of oriental turtle-dove.

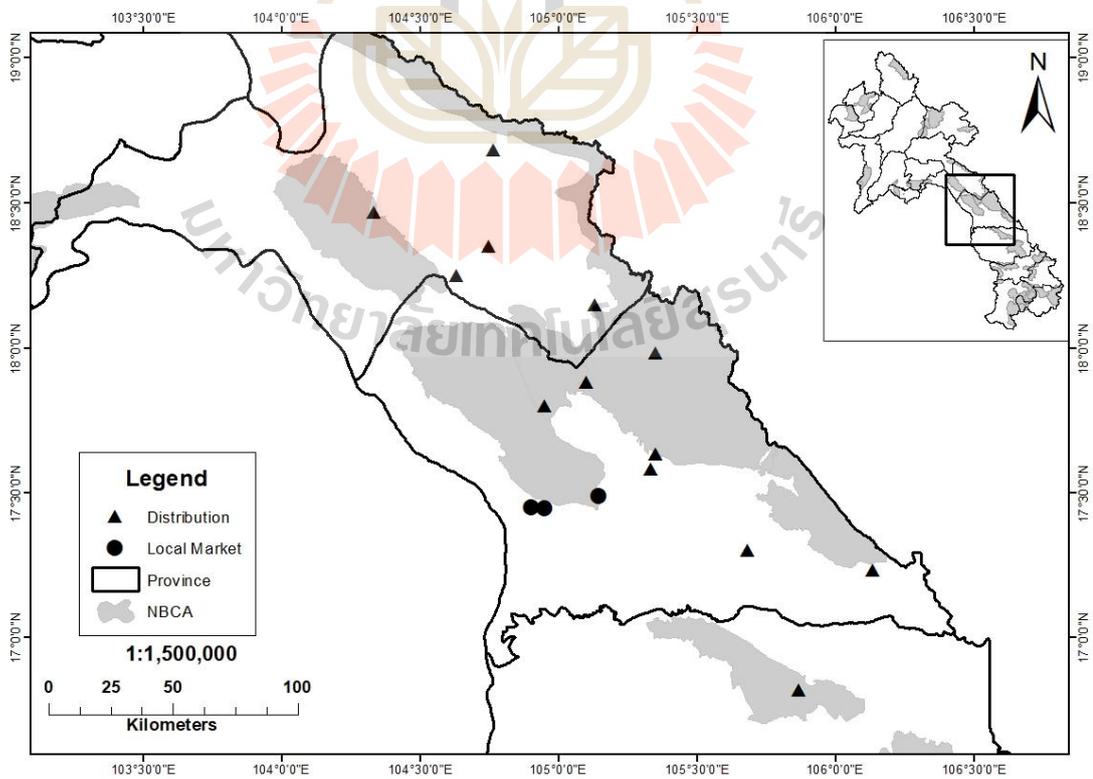


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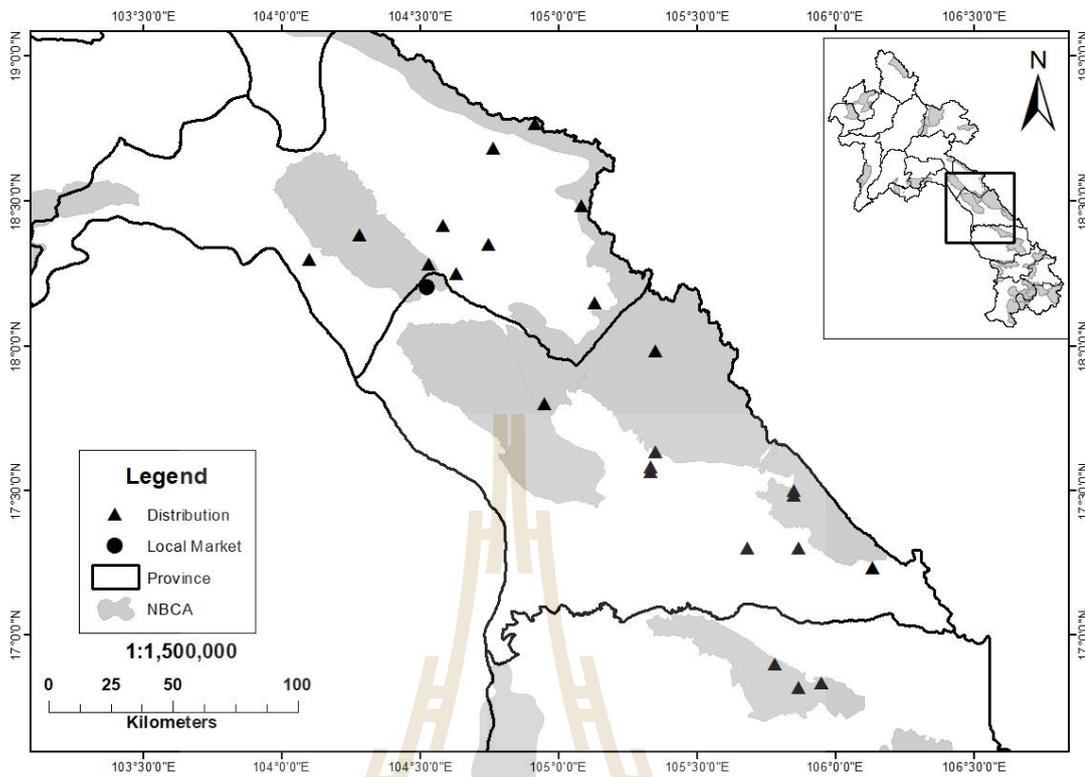


Figure 4.29 The distributions of barred cuckoo-dove.

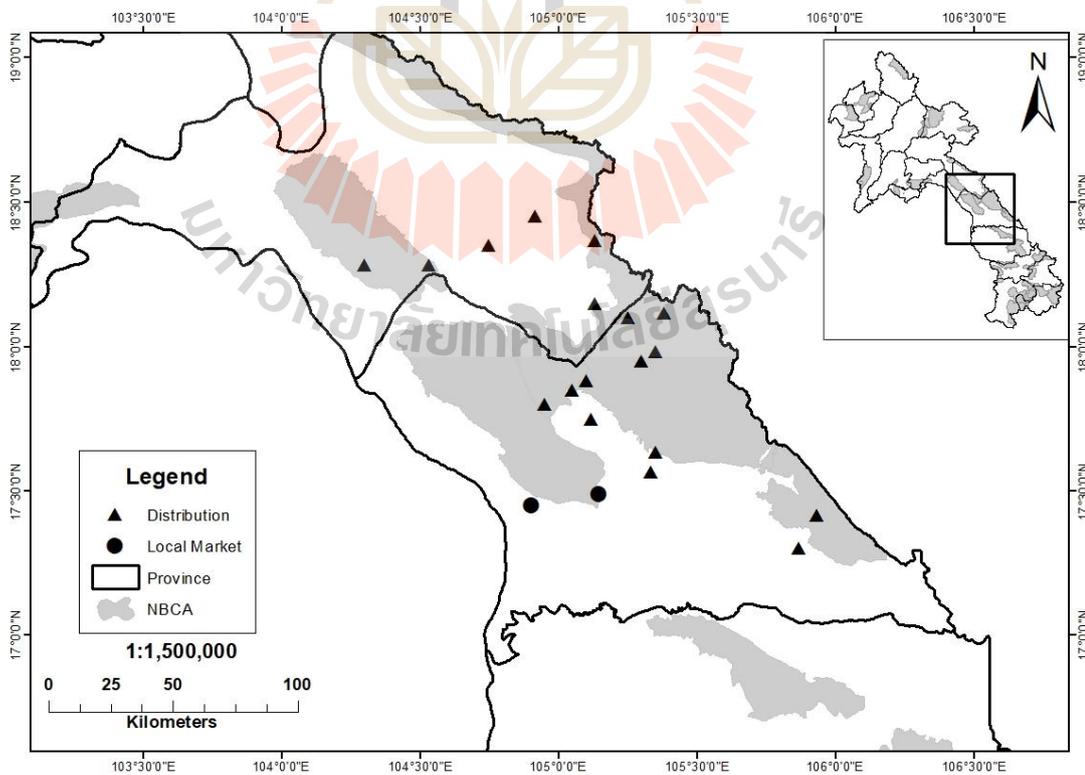


Figure 4.30 The distributions of grey-capped emerald dove.

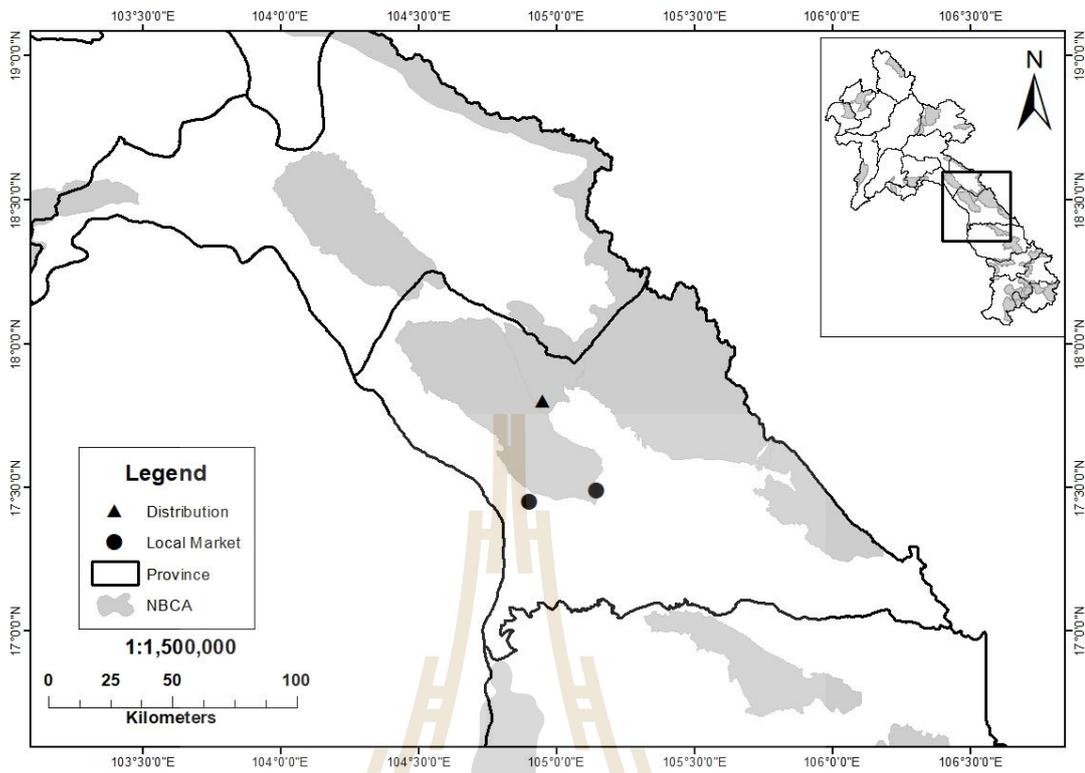


Figure 4.31 The distribution of thick-billed green-pigeon.

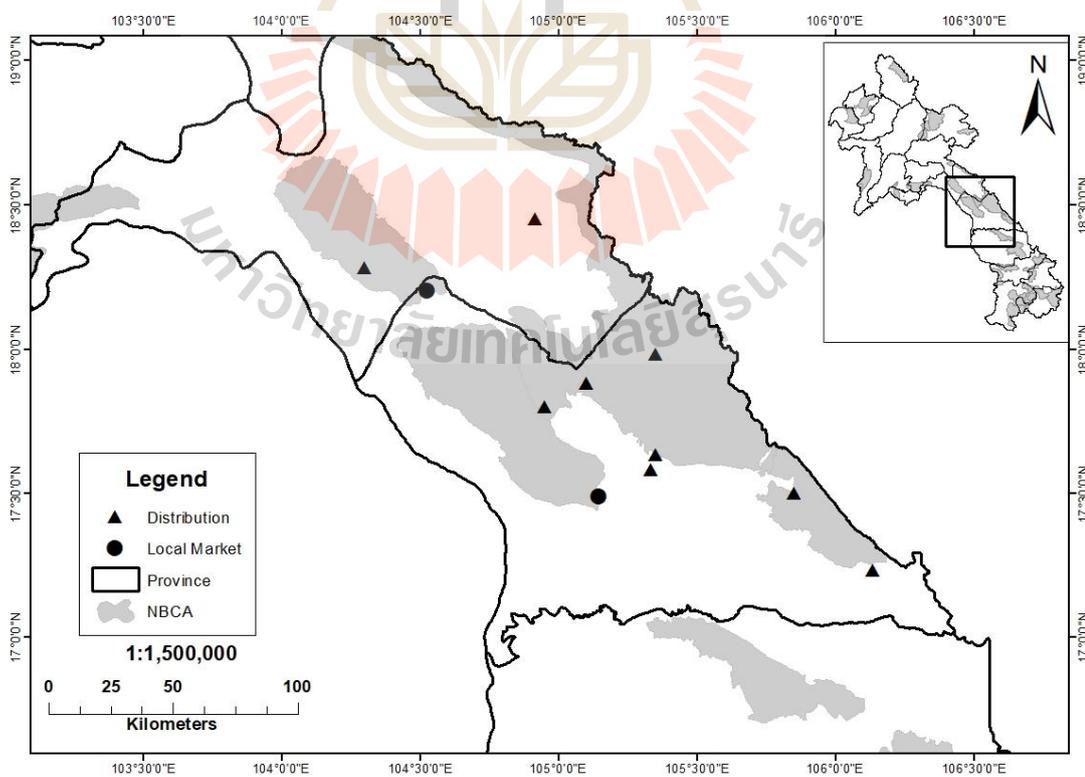


Figure 4.32 The distributions of yellow-vented green-pigeon.

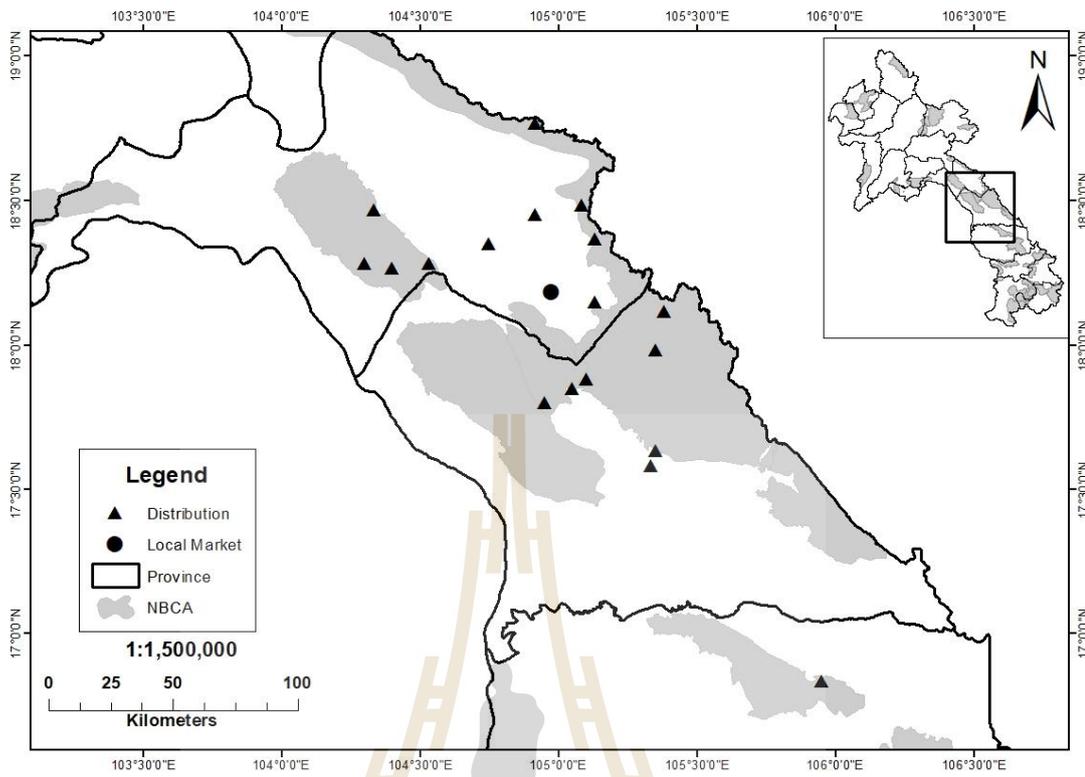


Figure 4.33 The distributions of white-breasted waterhen.

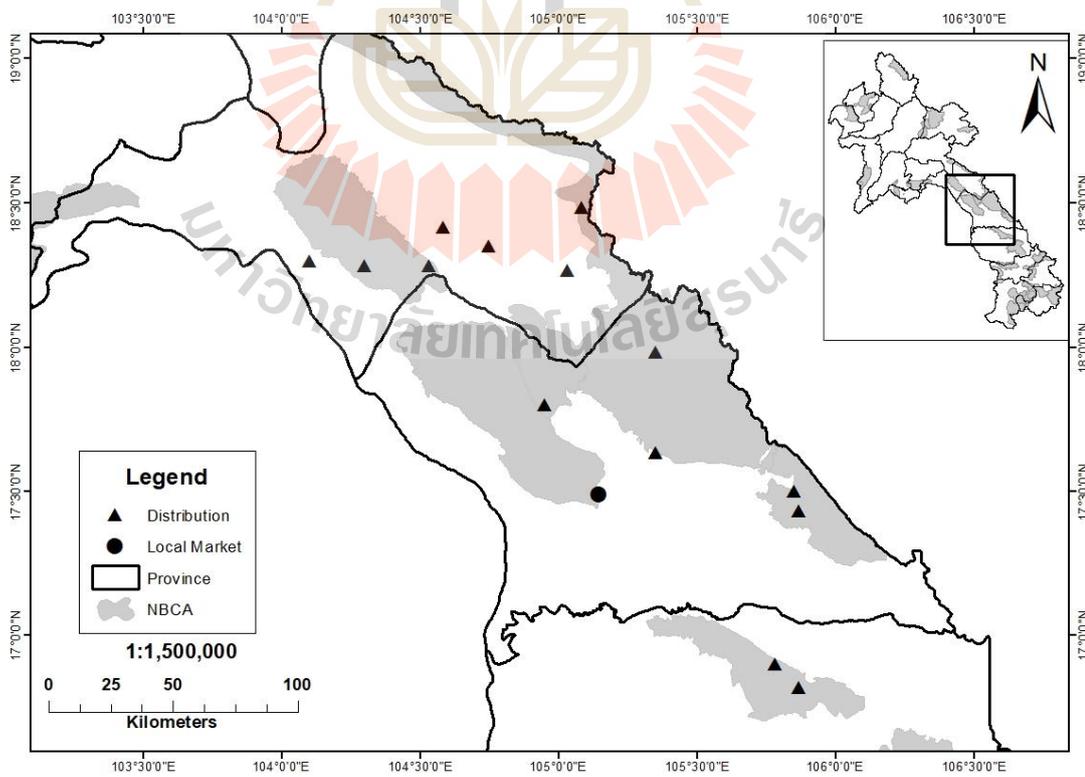


Figure 4.34 The distributions of common moorhen.

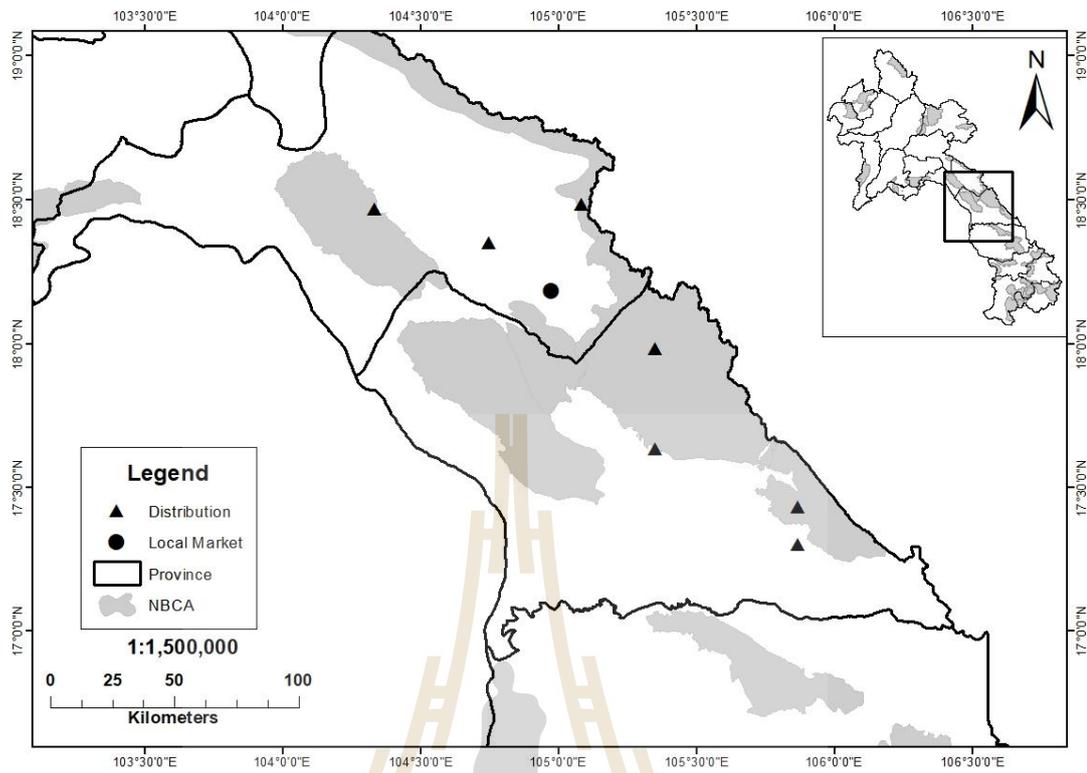


Figure 4.35 The distributions of yellow-legged buttonquail.

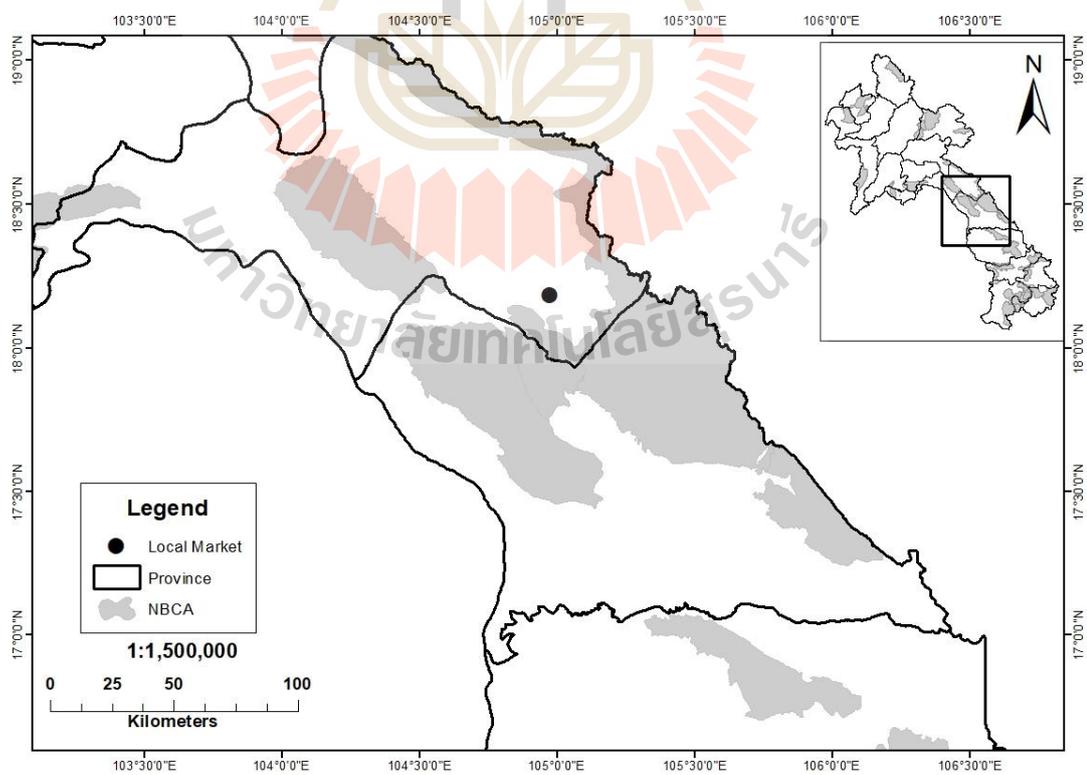


Figure 4.36 The distribution of barred buttonquail.

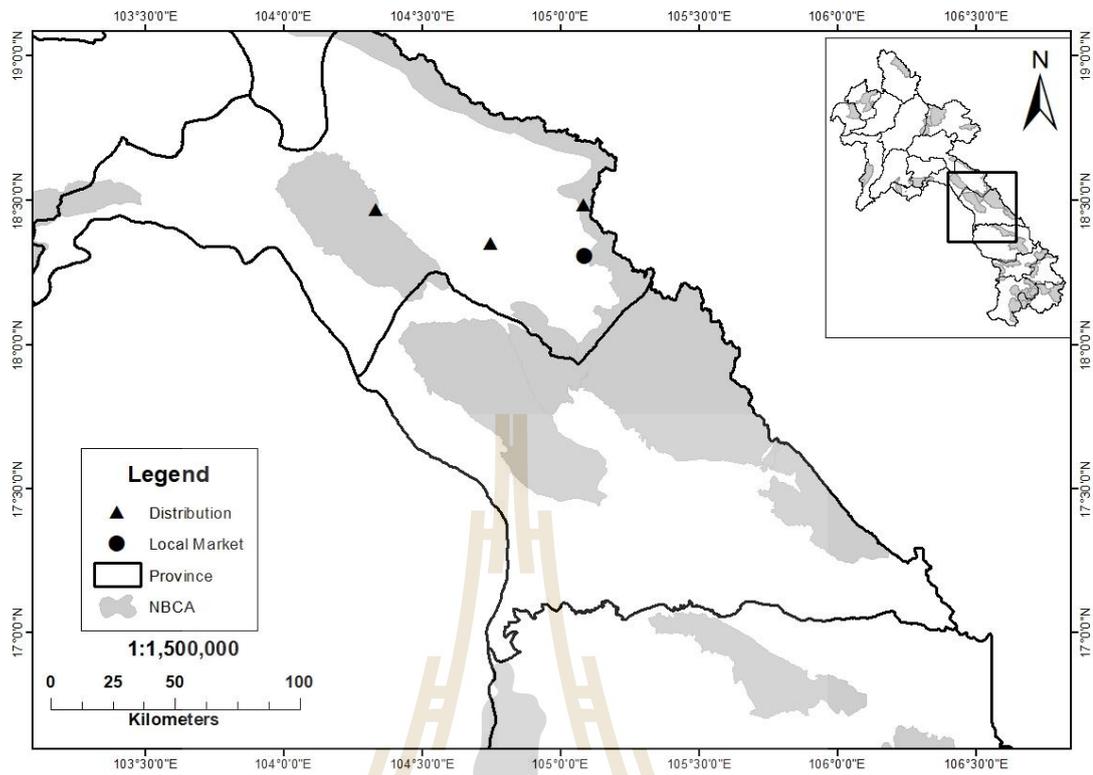


Figure 4.37 The distributions of Japanese sparrowhawk.

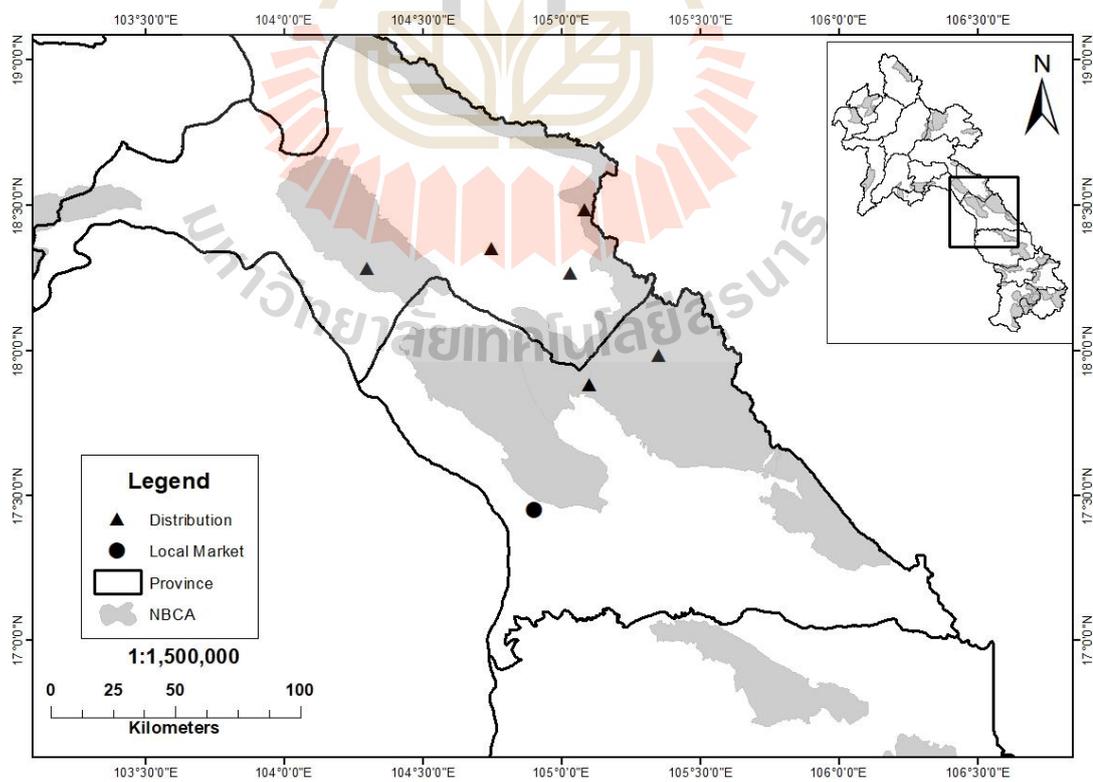


Figure 4.38 The distributions of besra.

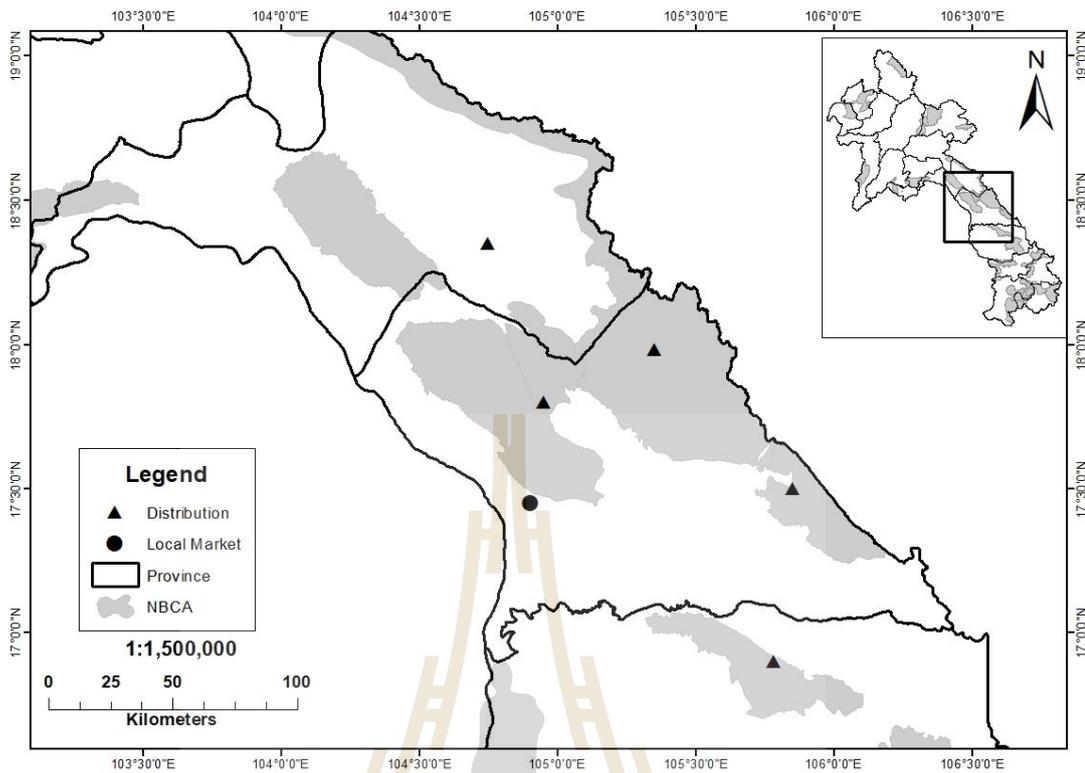


Figure 4.39 The distributions of rufous-winged buzzard.

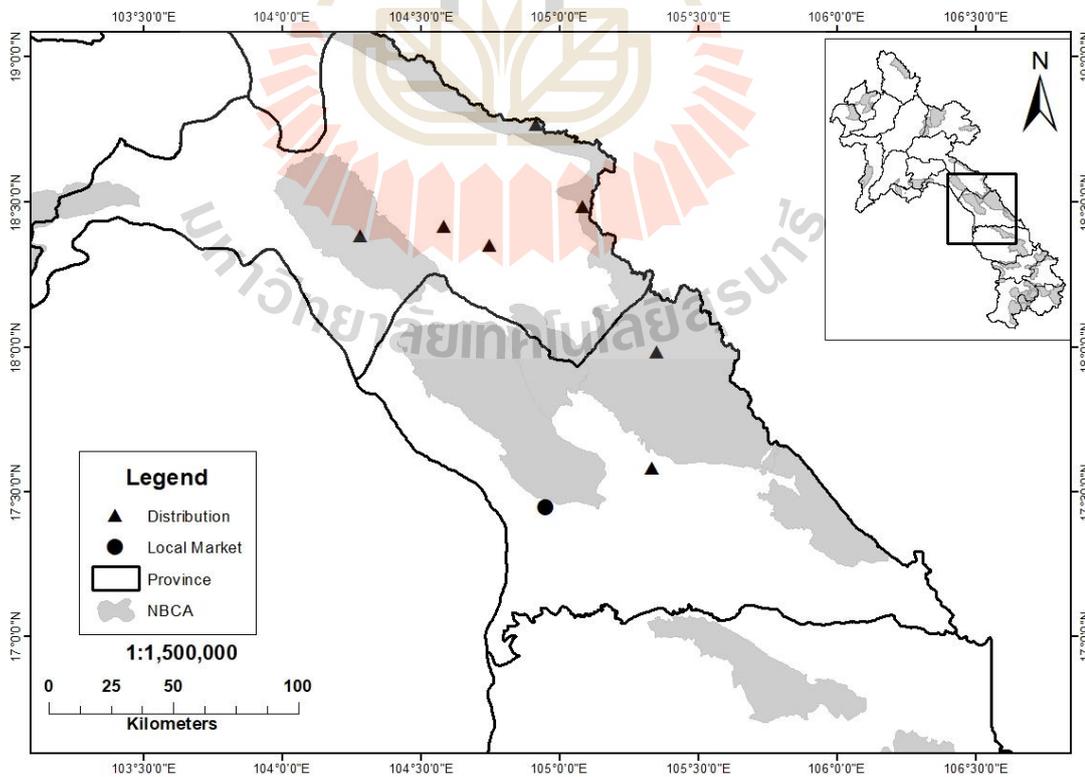


Figure 4.40 The distributions of little egret.

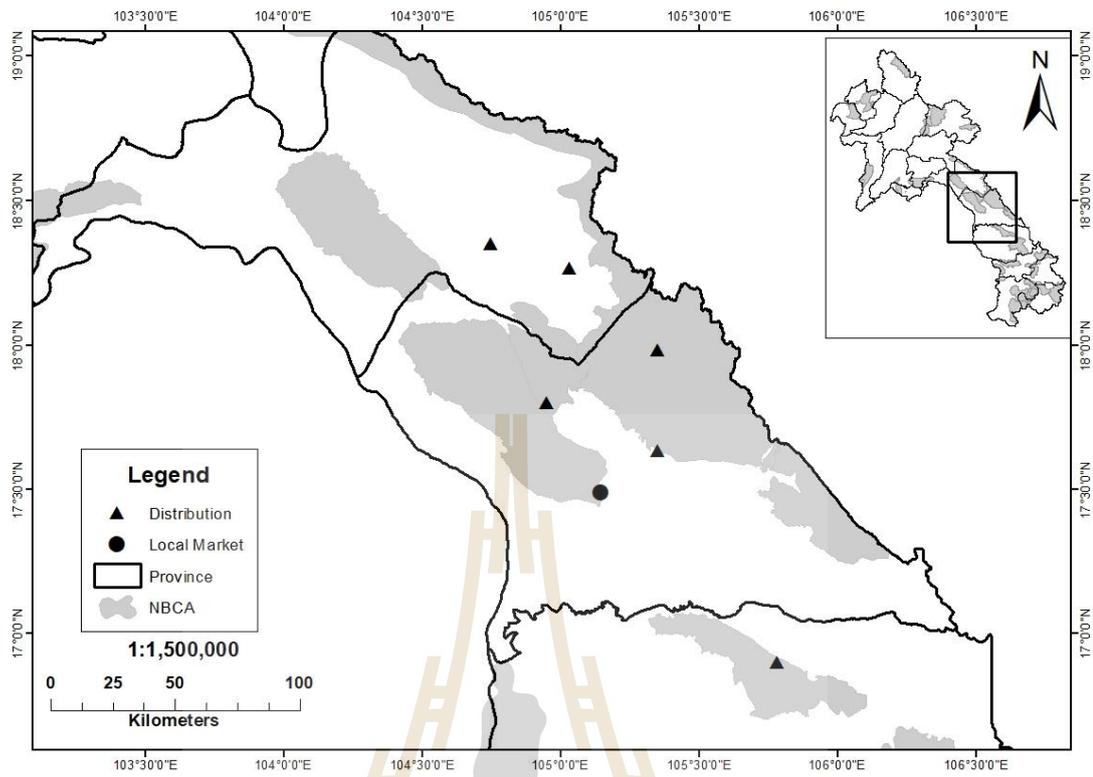


Figure 4.41 The distributions of purple heron.

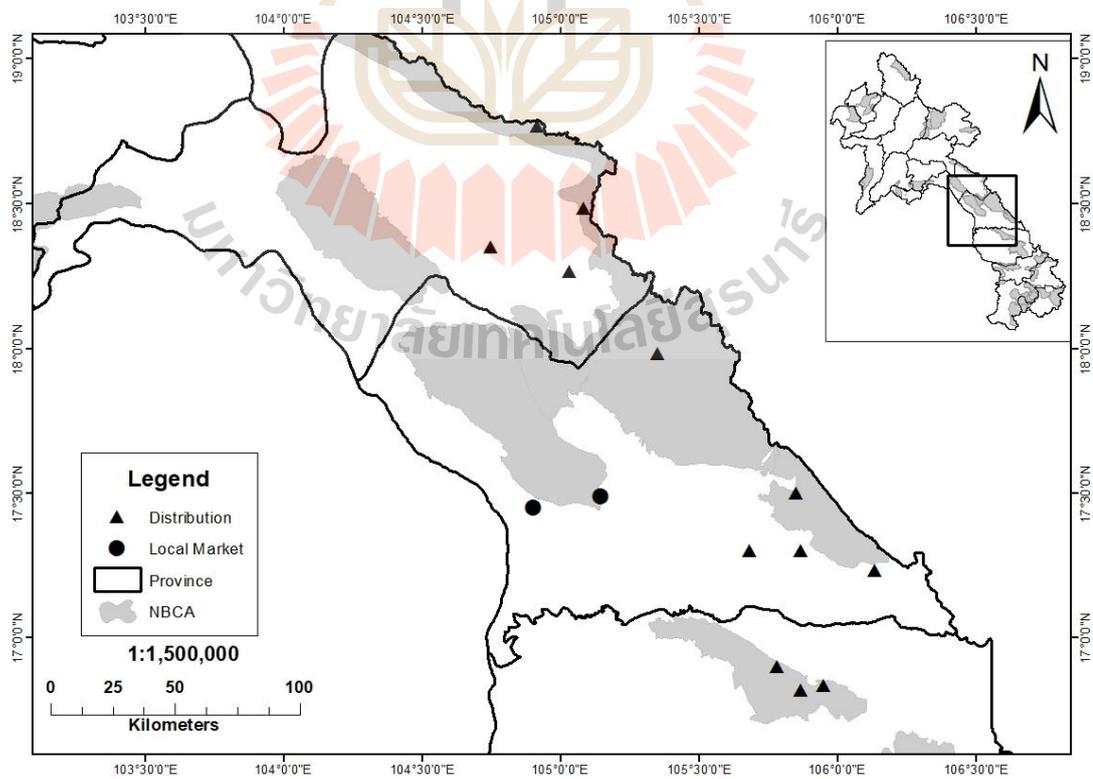


Figure 4.42 The distributions of Chinese pond heron.

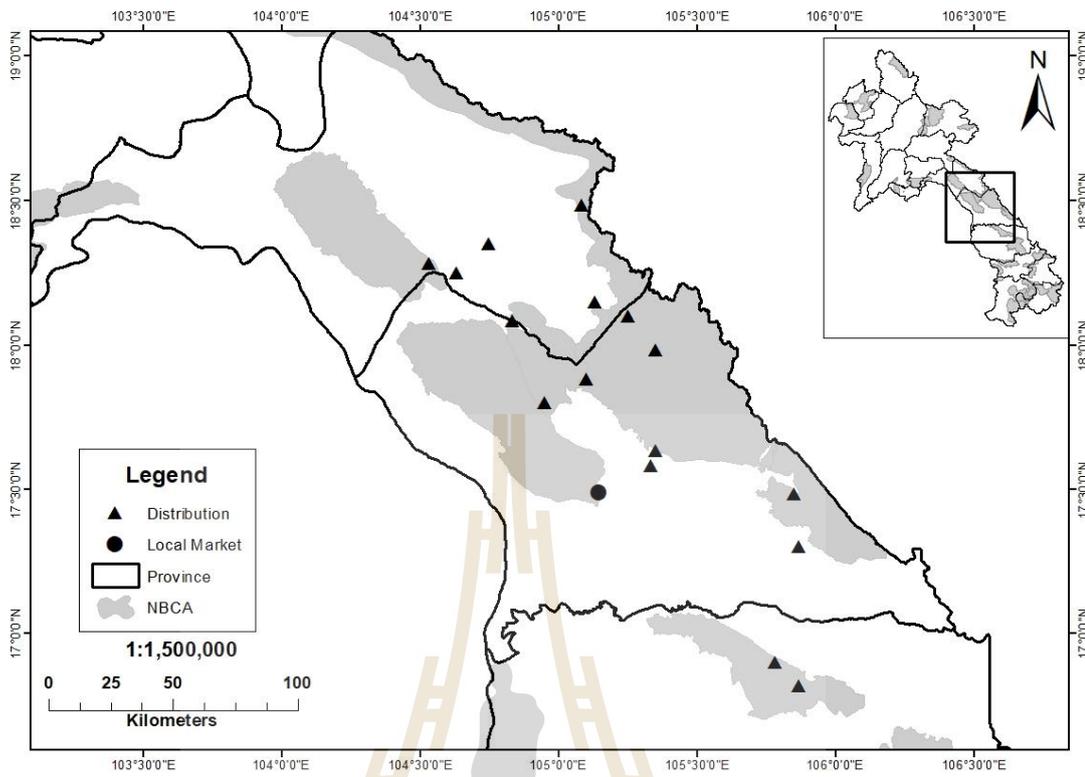


Figure 4.43 The distributions of green-backed heron.

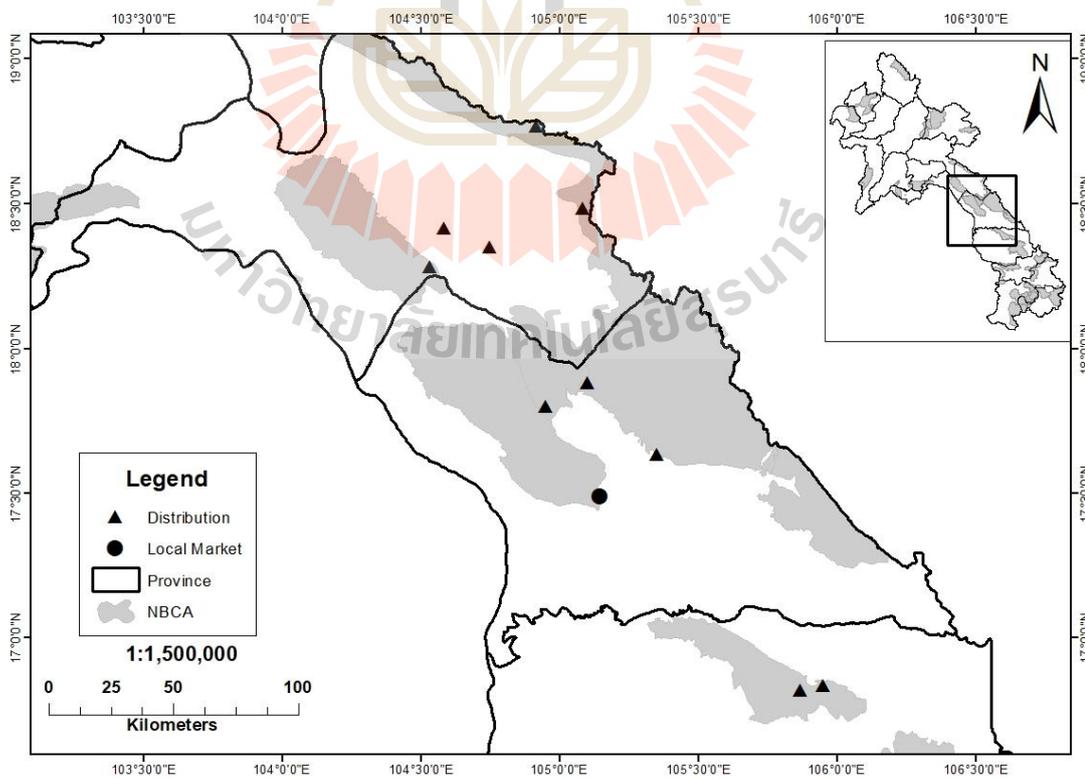


Figure 4.44 The distributions of cinnamon bittern.

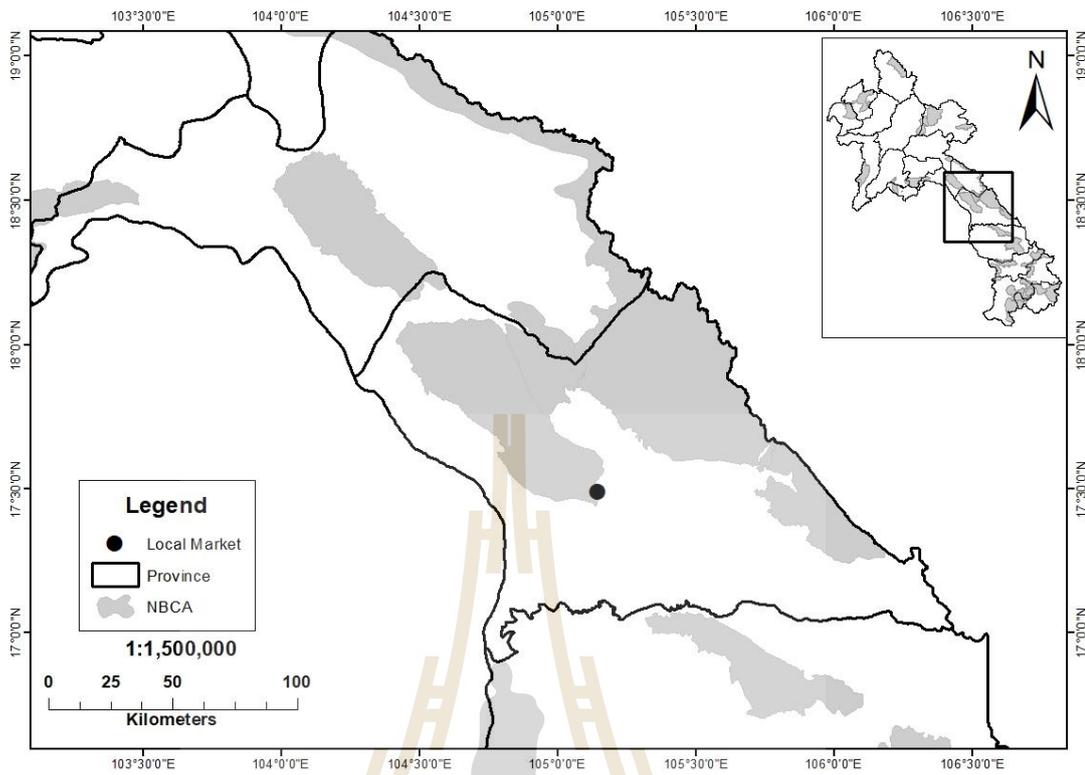


Figure 4.45 The distribution of black bittern.

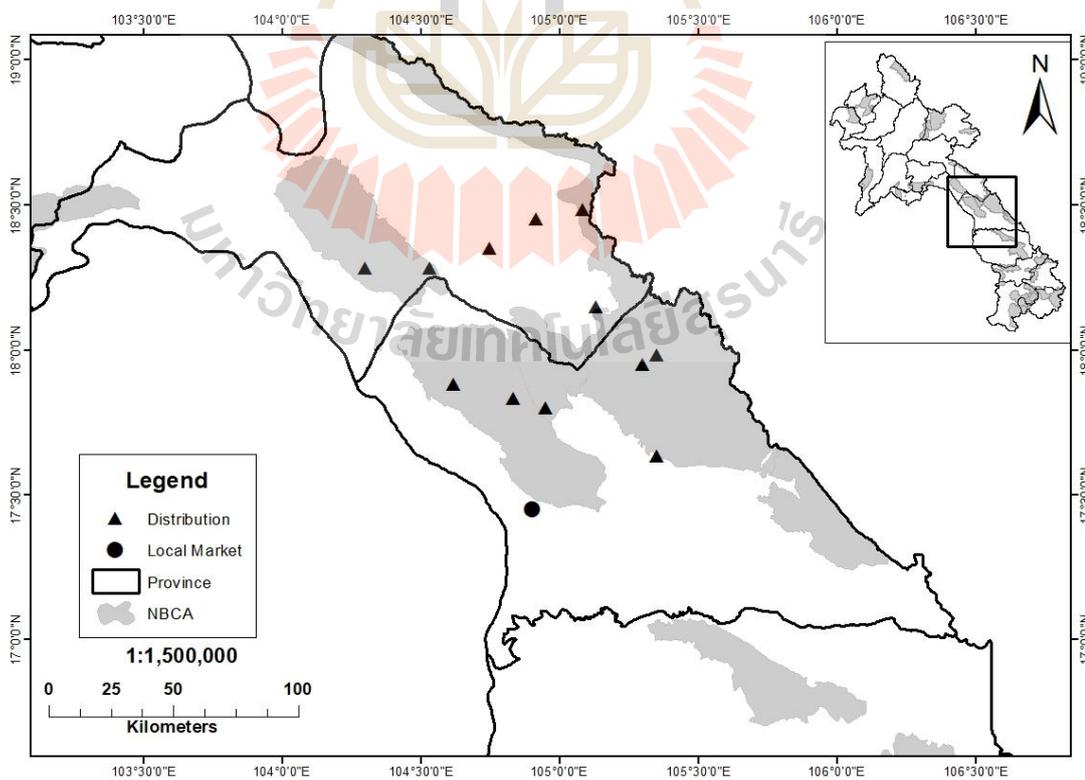


Figure 4.46 The distributions of blue pitta.

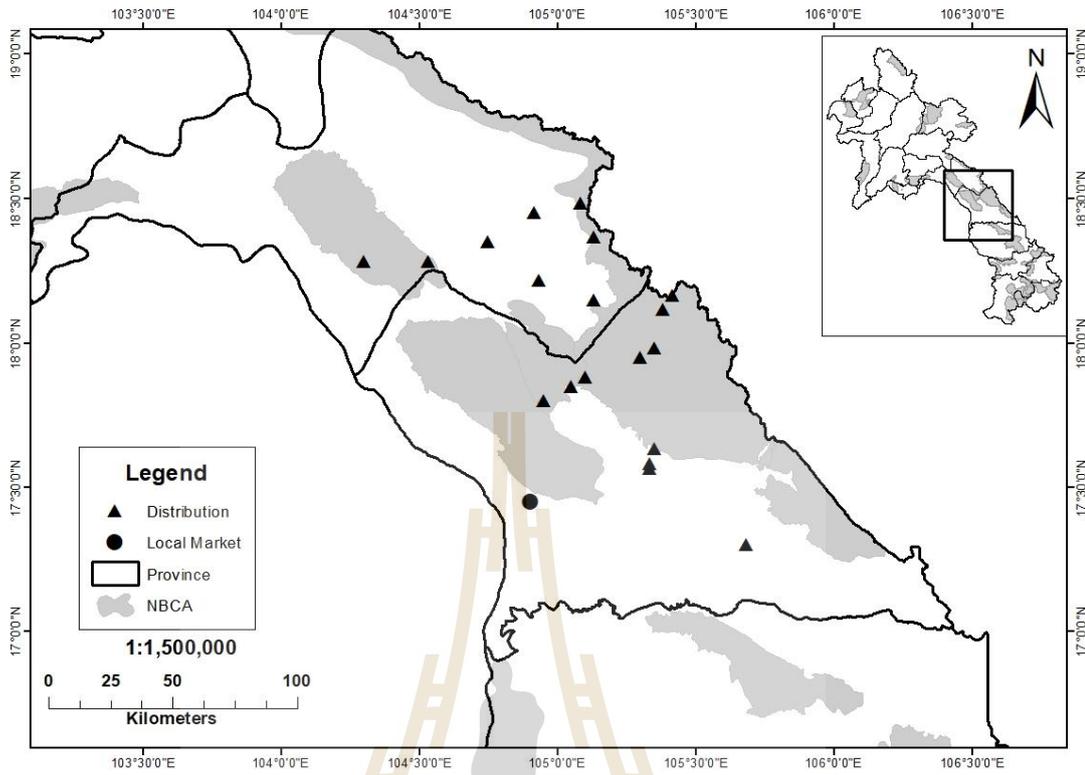


Figure 4.47 The distributions of long-tailed broadbill.

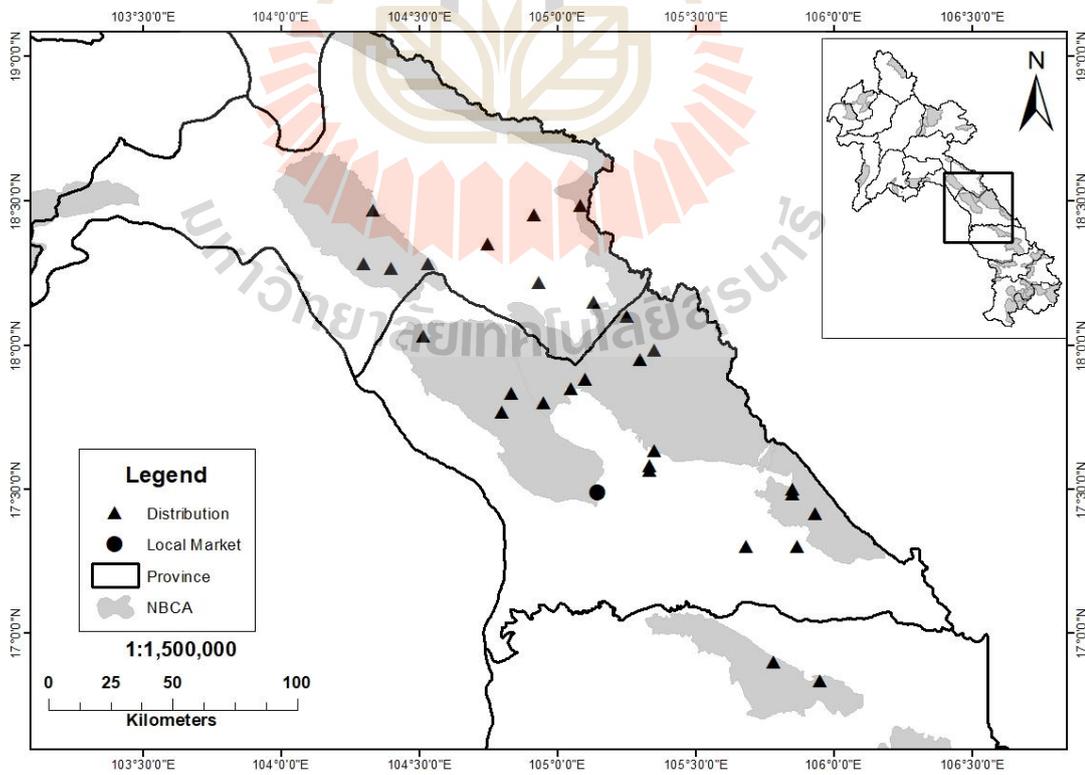


Figure 4.48 The distributions of Asian fairy bluebird.

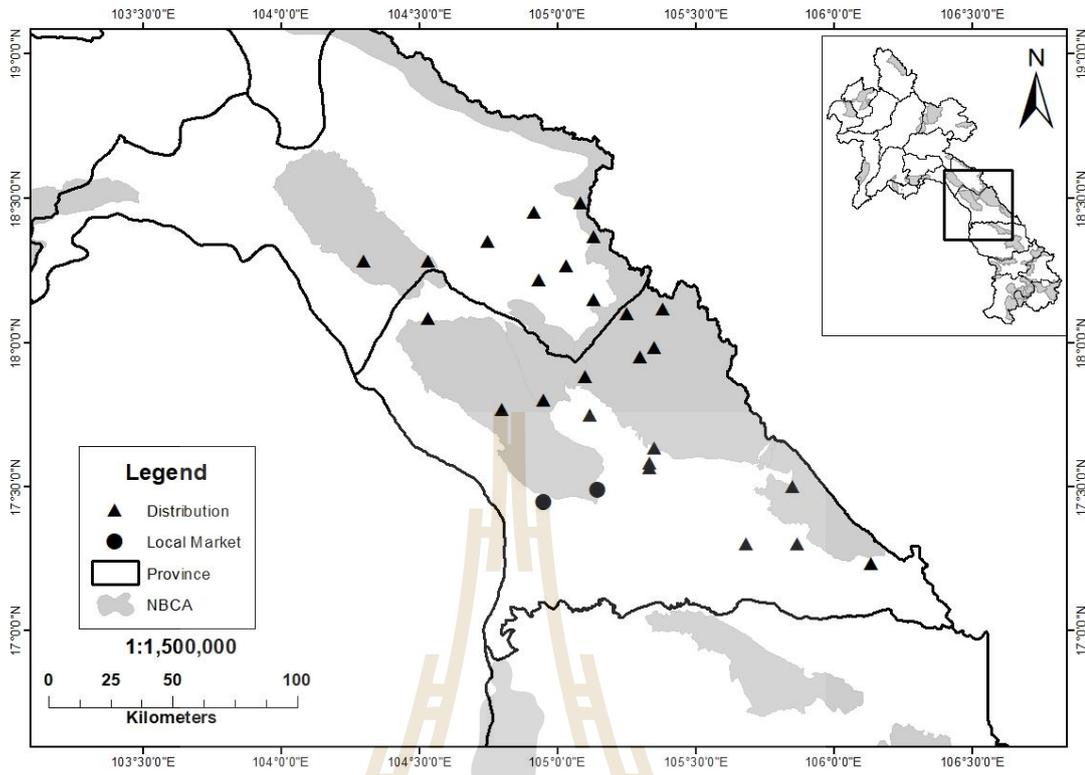


Figure 4.49 The distributions of blue-winged leafbird.

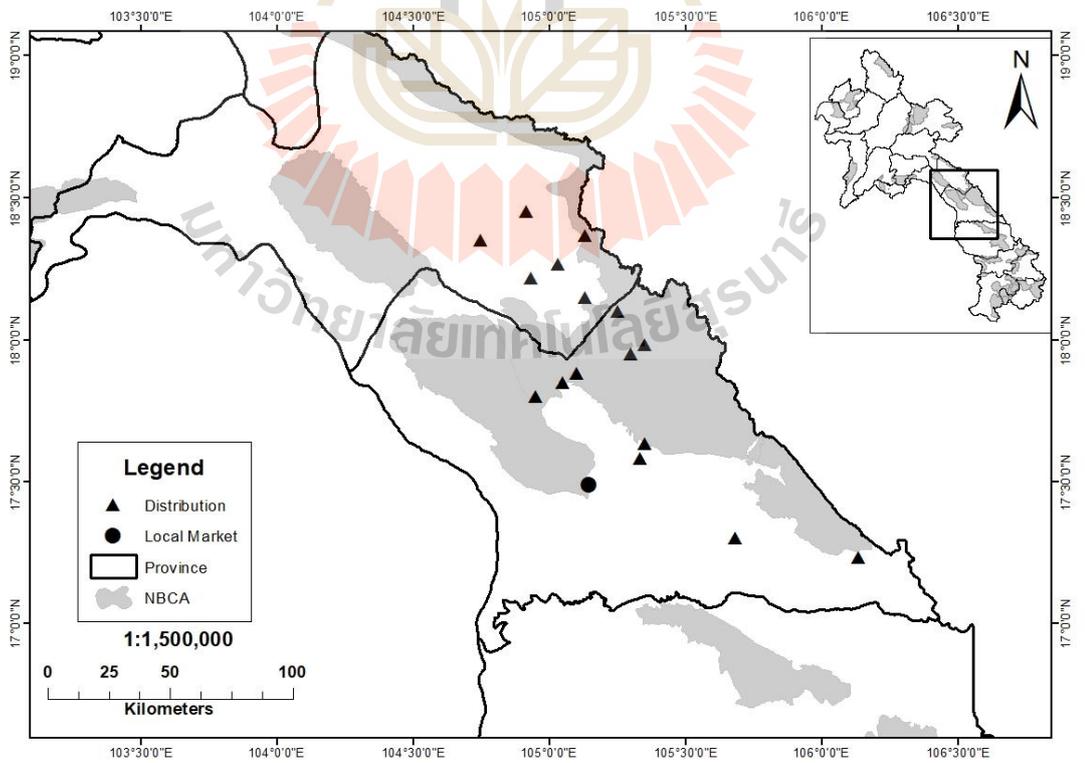


Figure 4.50 The distributions of orange-bellied leafbird.

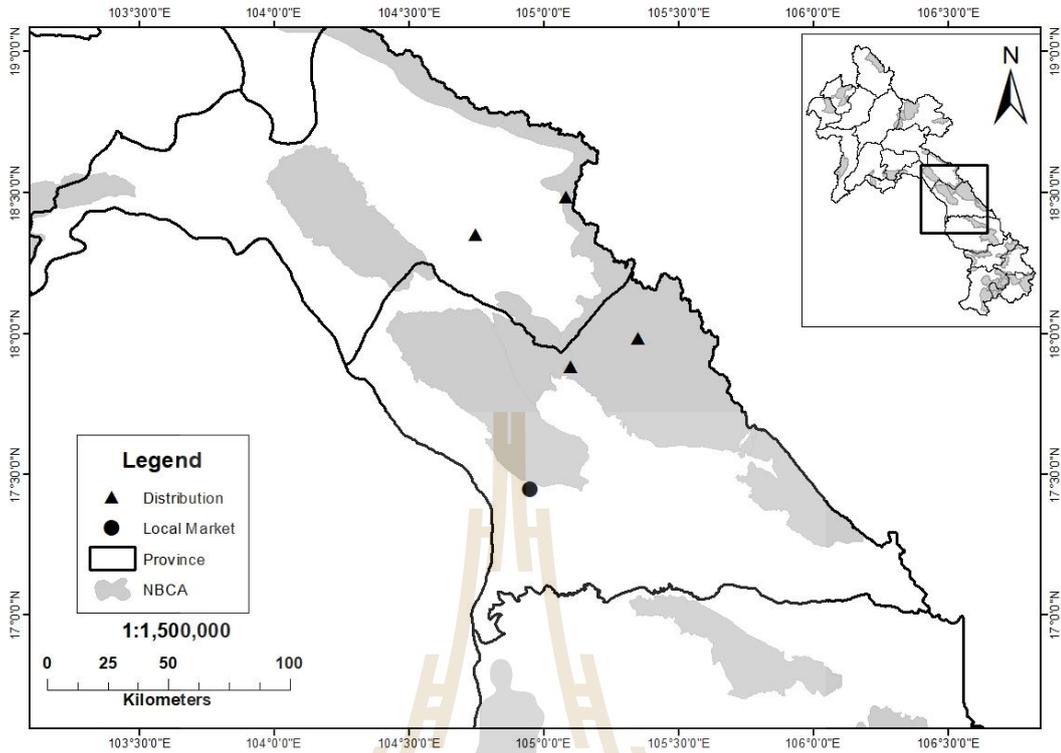


Figure 4.51 The distributions of black-naped oriole.

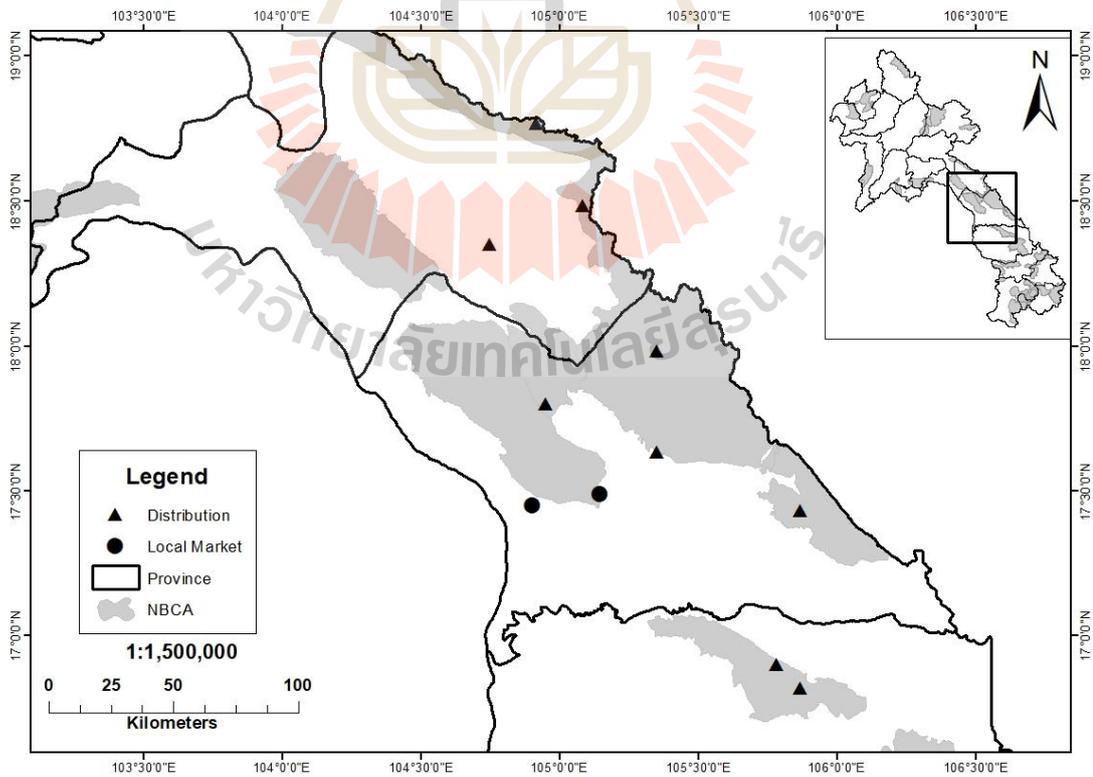


Figure 4.52 The distributions of black drongo.

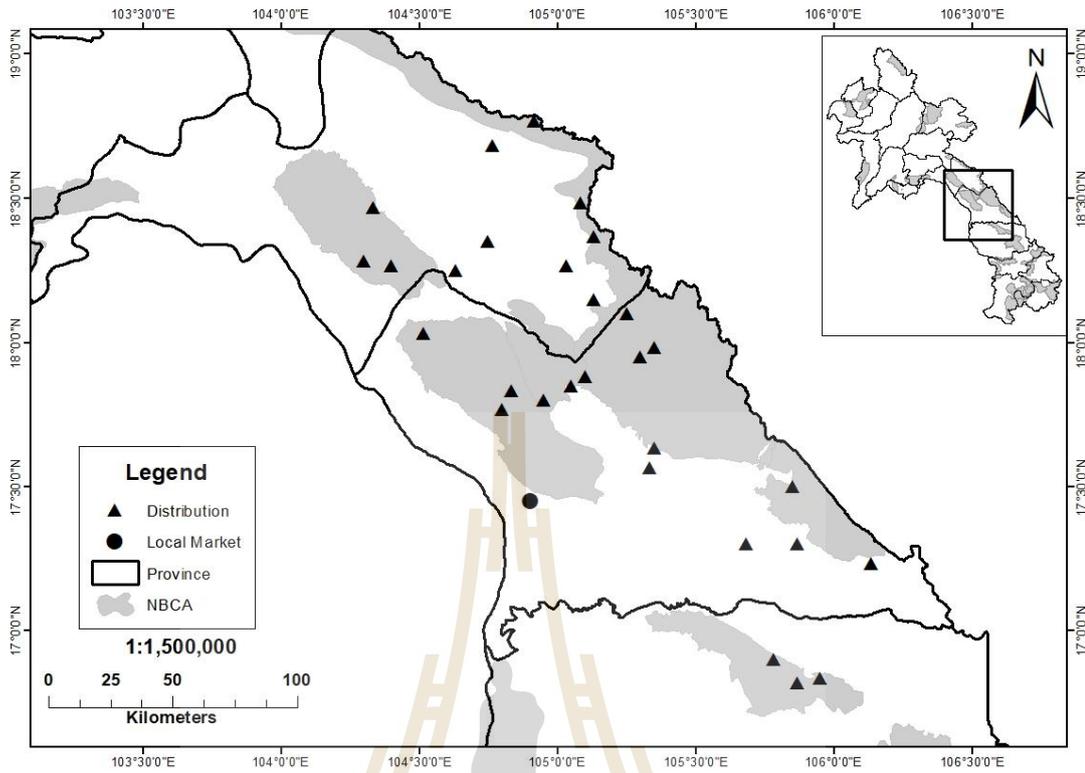


Figure 4.53 The distributions of ash drongo.

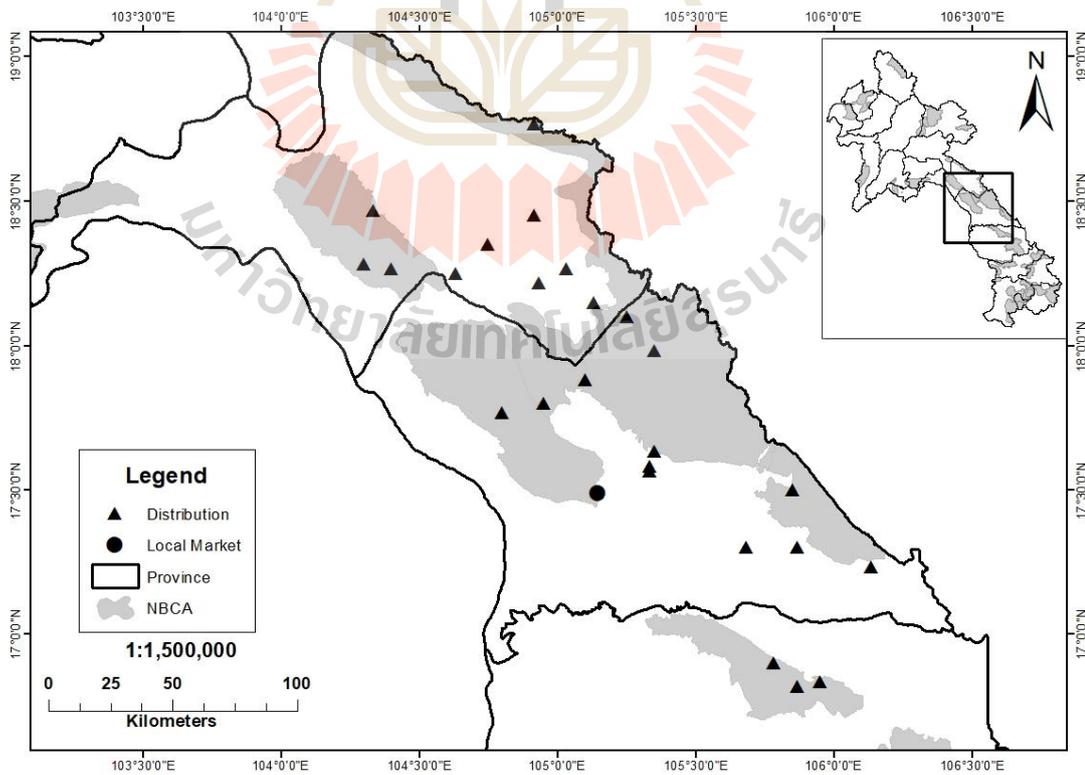


Figure 4.54 The distributions of hair-crested drongo.

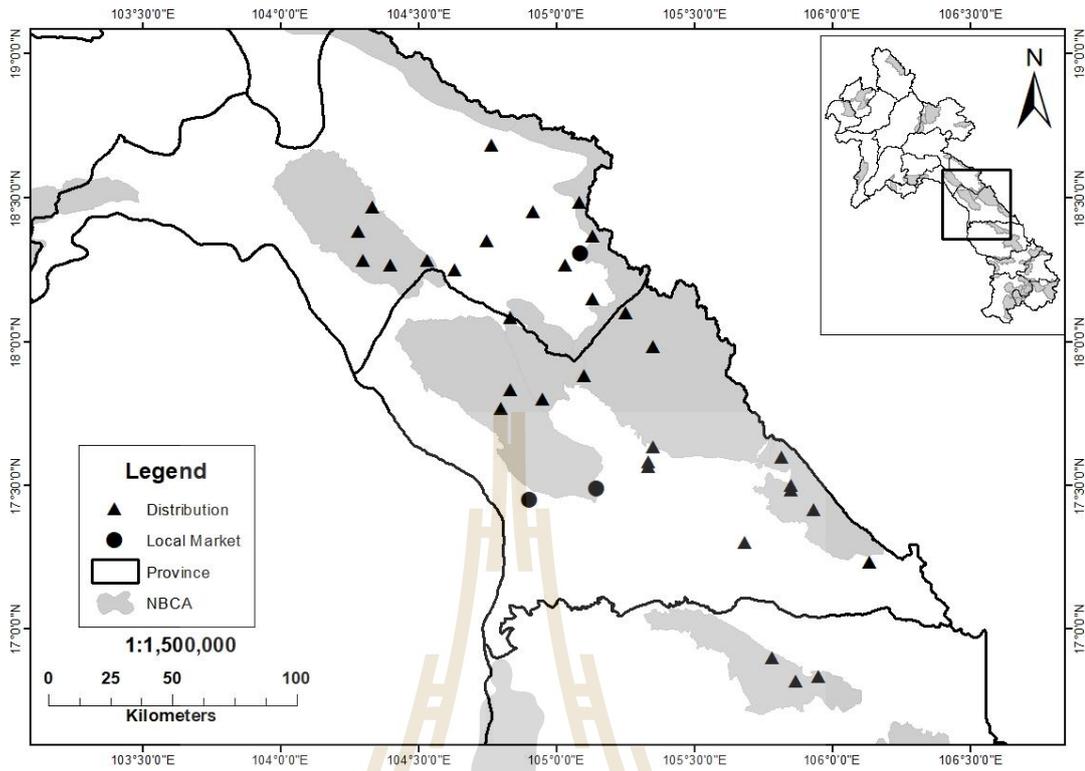


Figure 4.55 The distributions of greater racquet-tailed drongo.

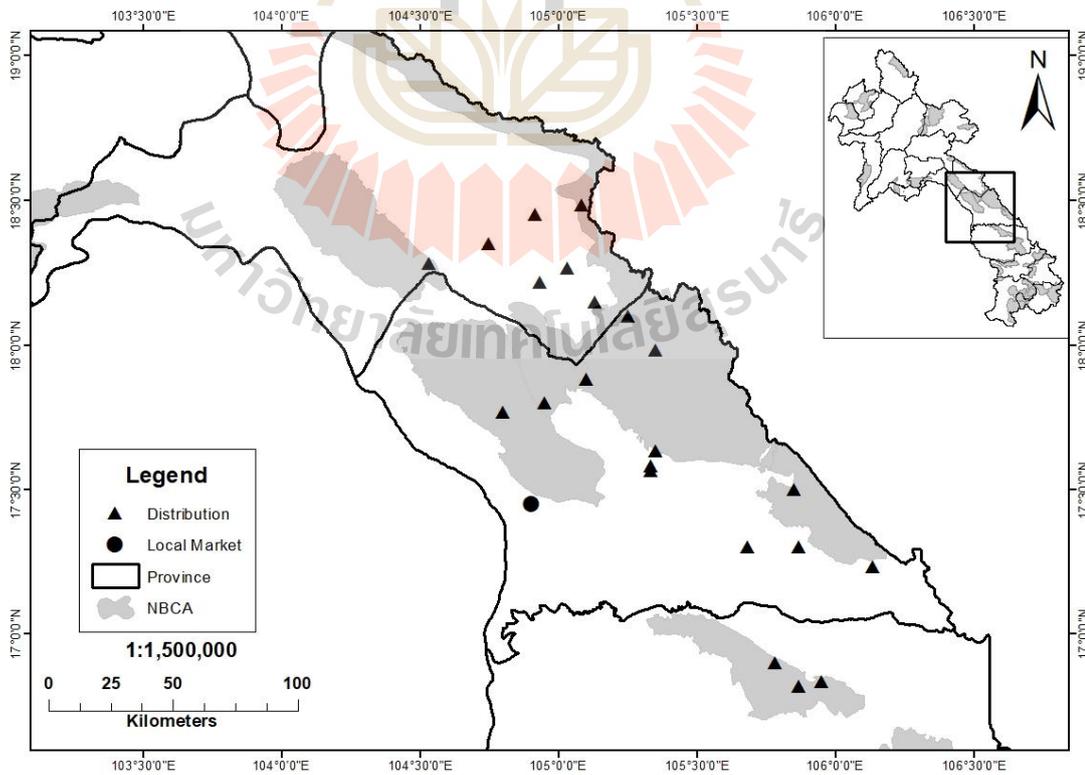


Figure 4.56 The distributions of black-naped monarch.

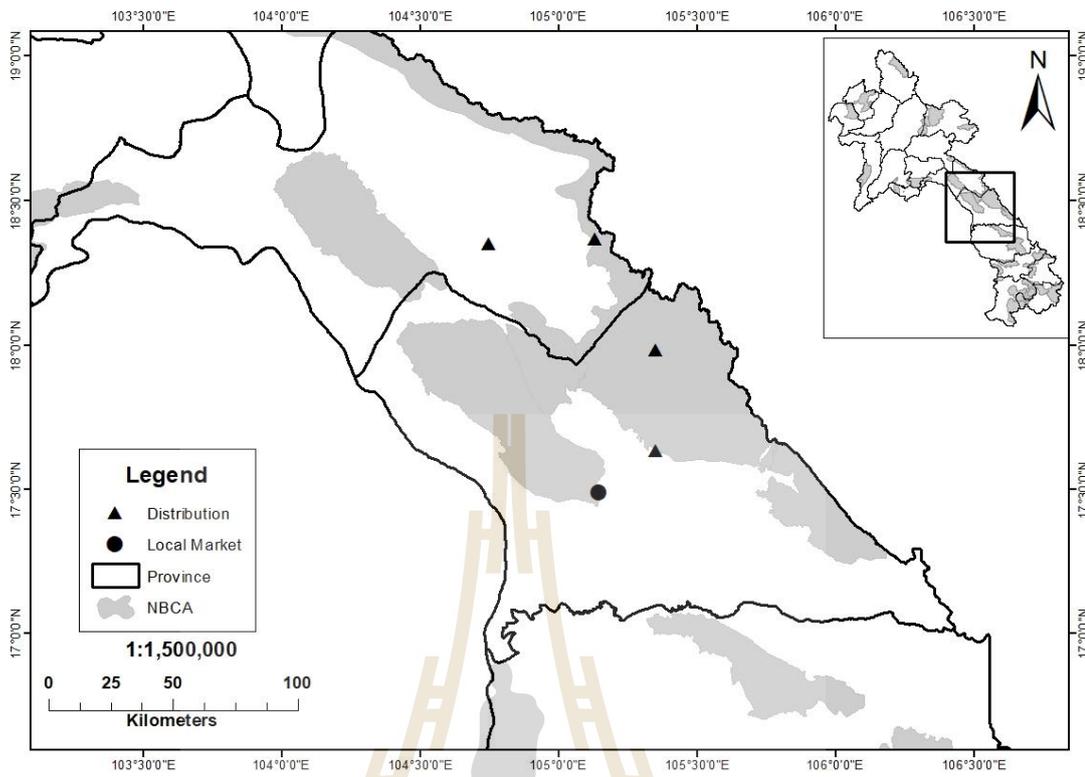


Figure 4.57 The distributions of Japanese thrush.

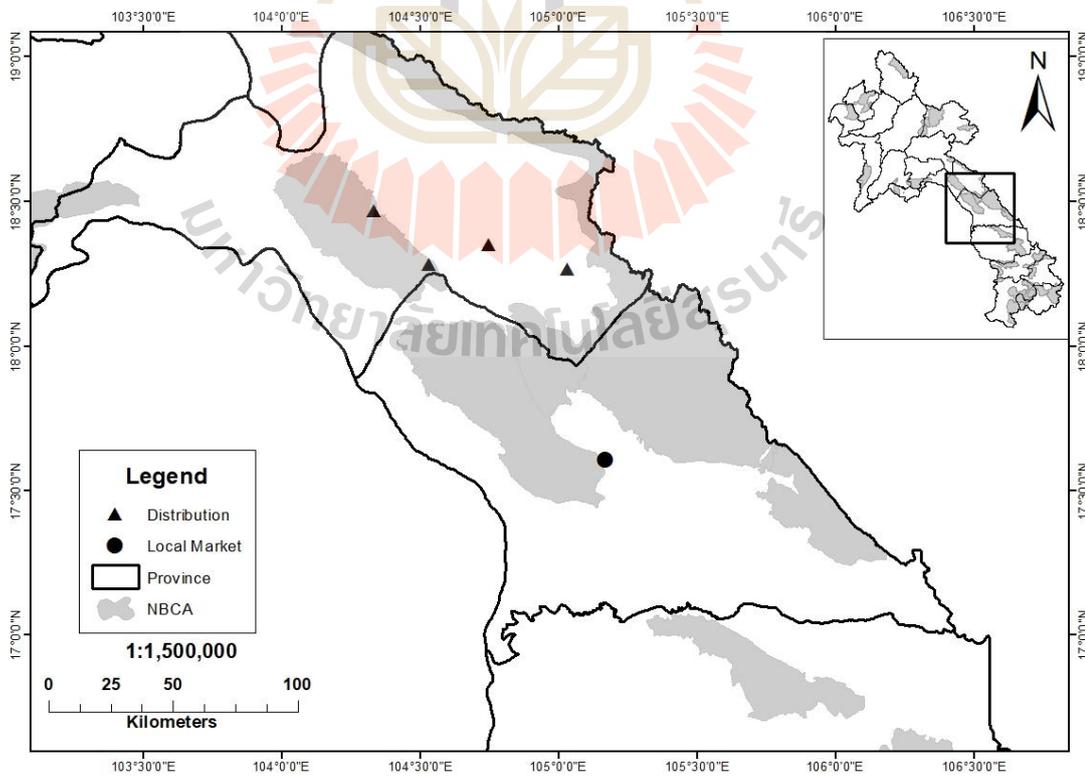


Figure 4.58 The distributions of white-throated rock-thrush.

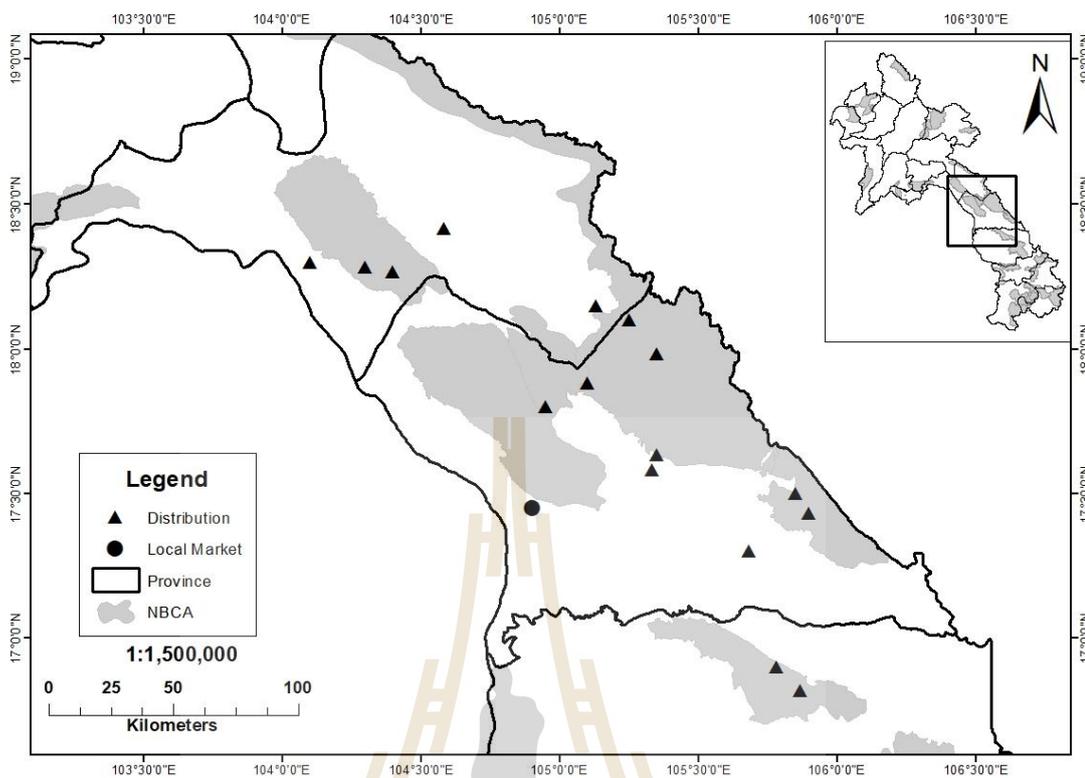


Figure 4.59 The distributions of blue-rock-thrush.

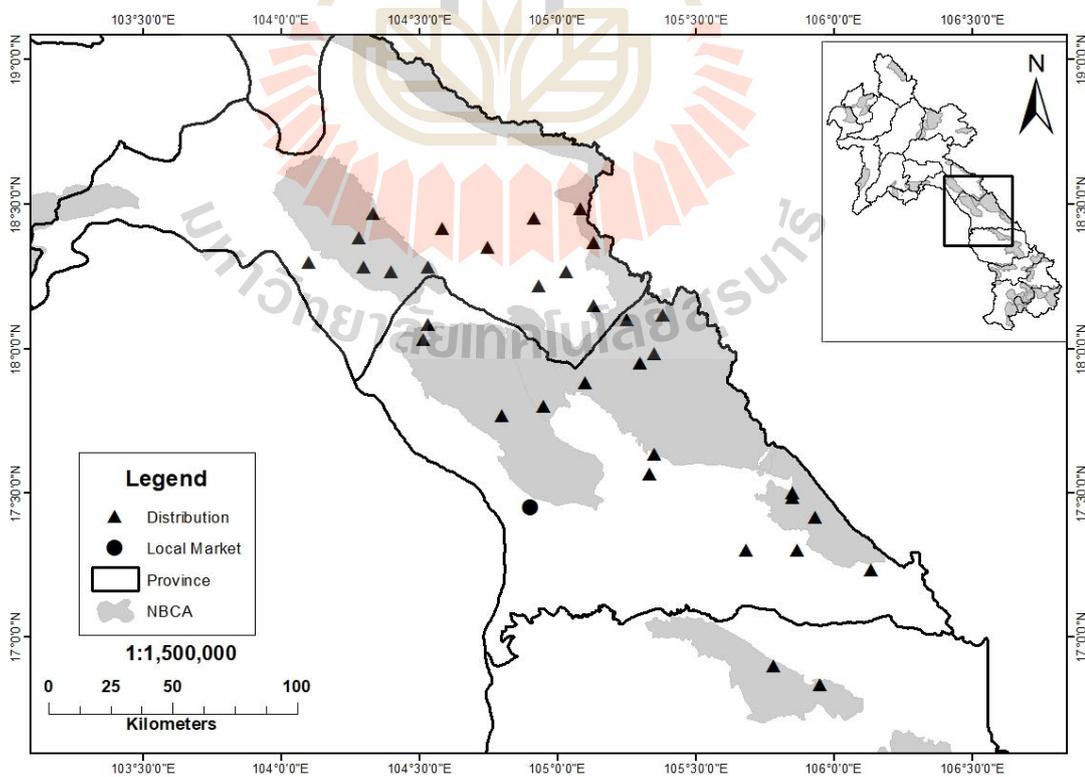


Figure 4.60 The distributions of blue-whistling-thrush.

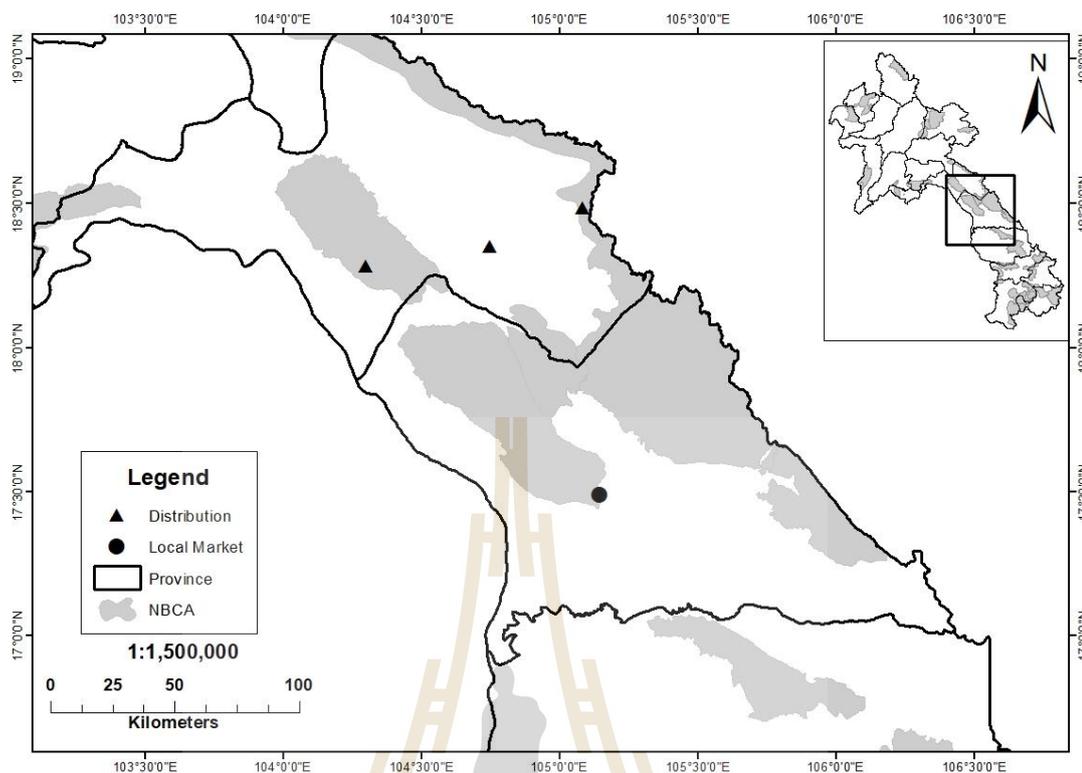


Figure 4.61 The distributions of yellow-rumped flycatcher.

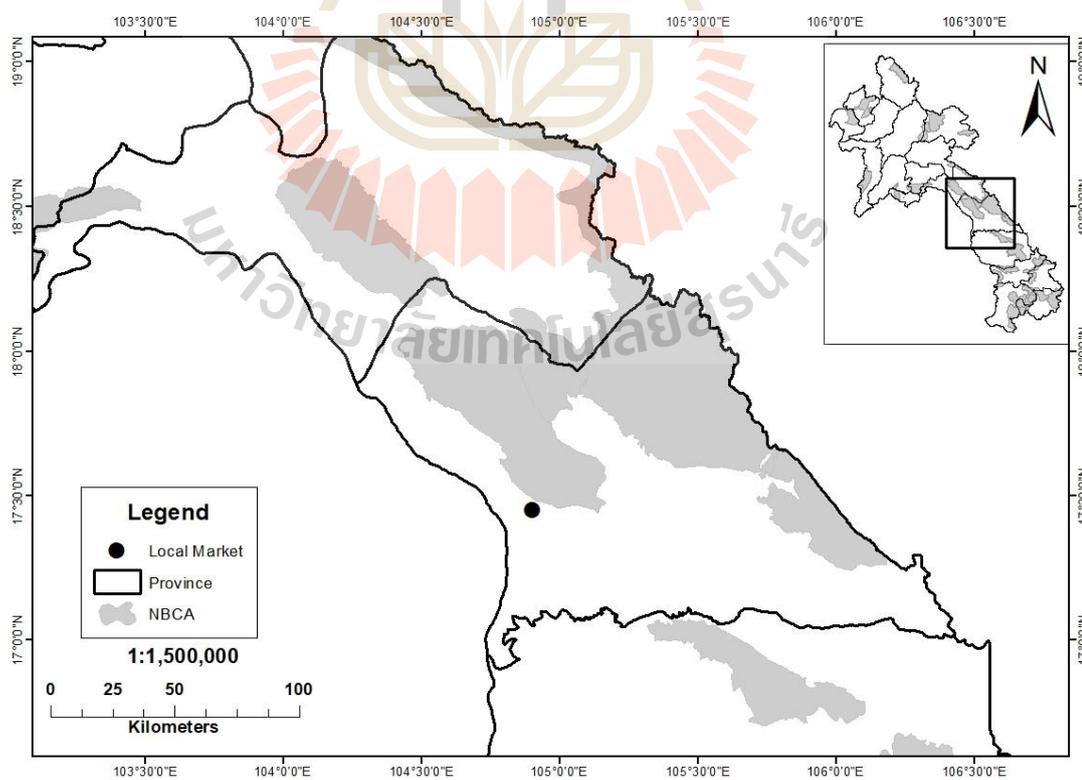


Figure 4.62 The distribution of slaty-backed flycatcher.

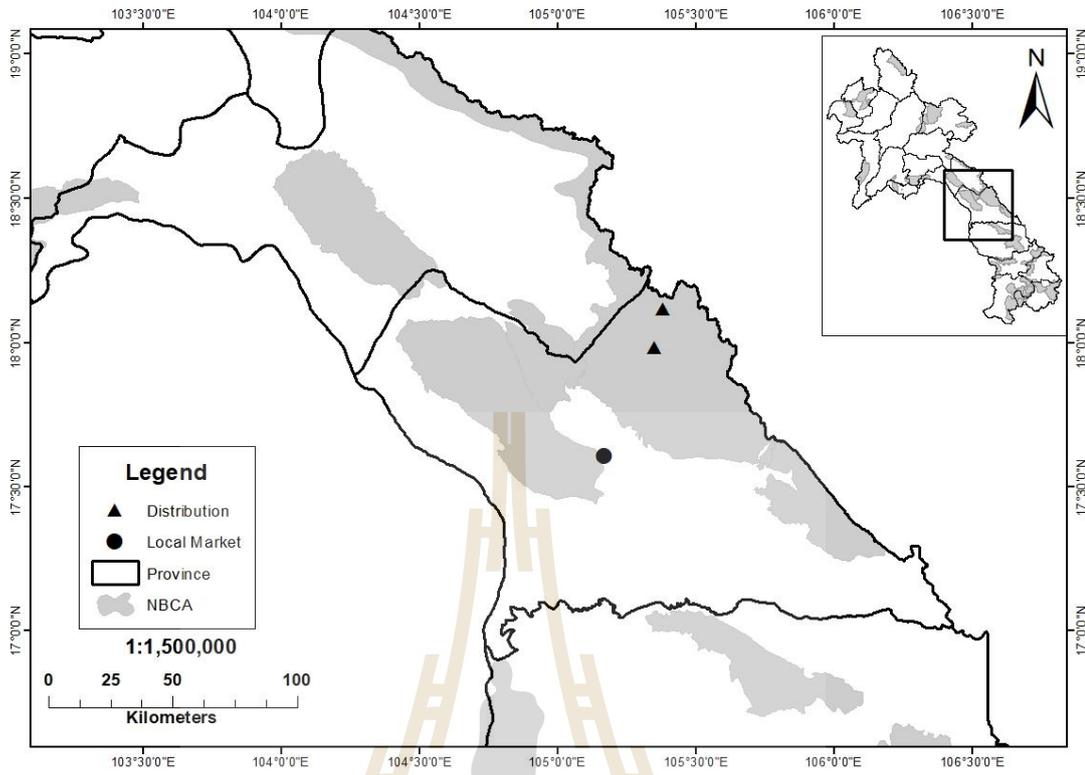


Figure 4.63 The distributions of pygmy blue flycatcher.

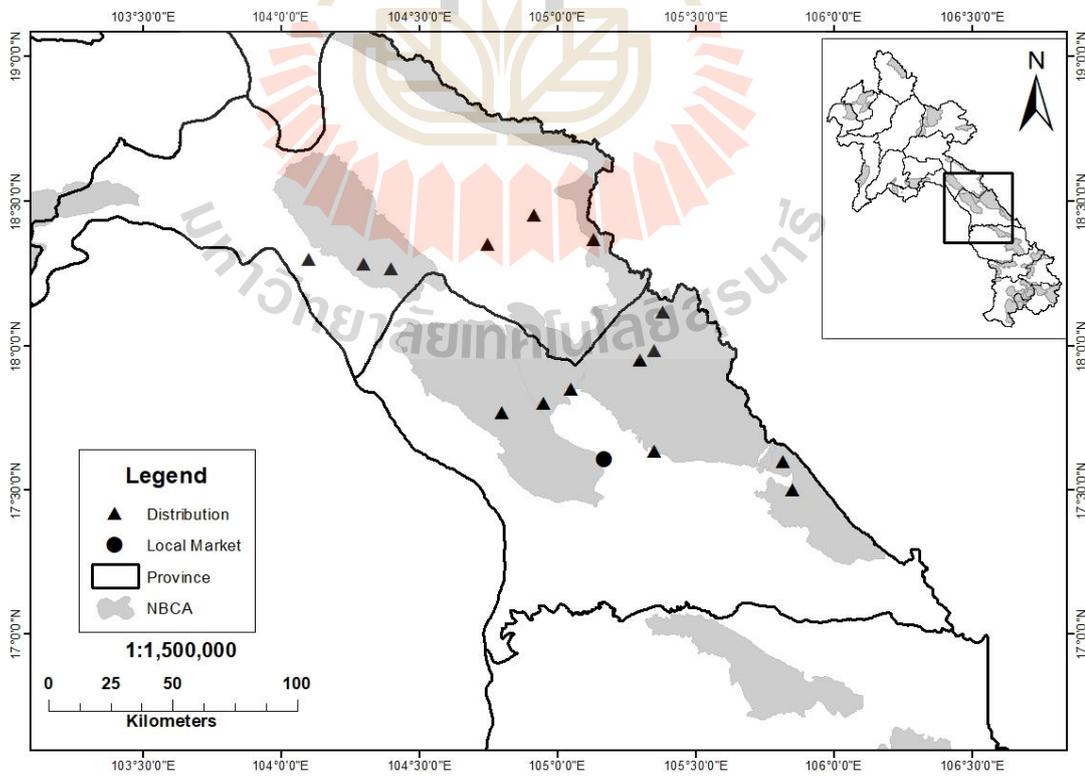


Figure 4.64 The distributions of verditer flycatcher.

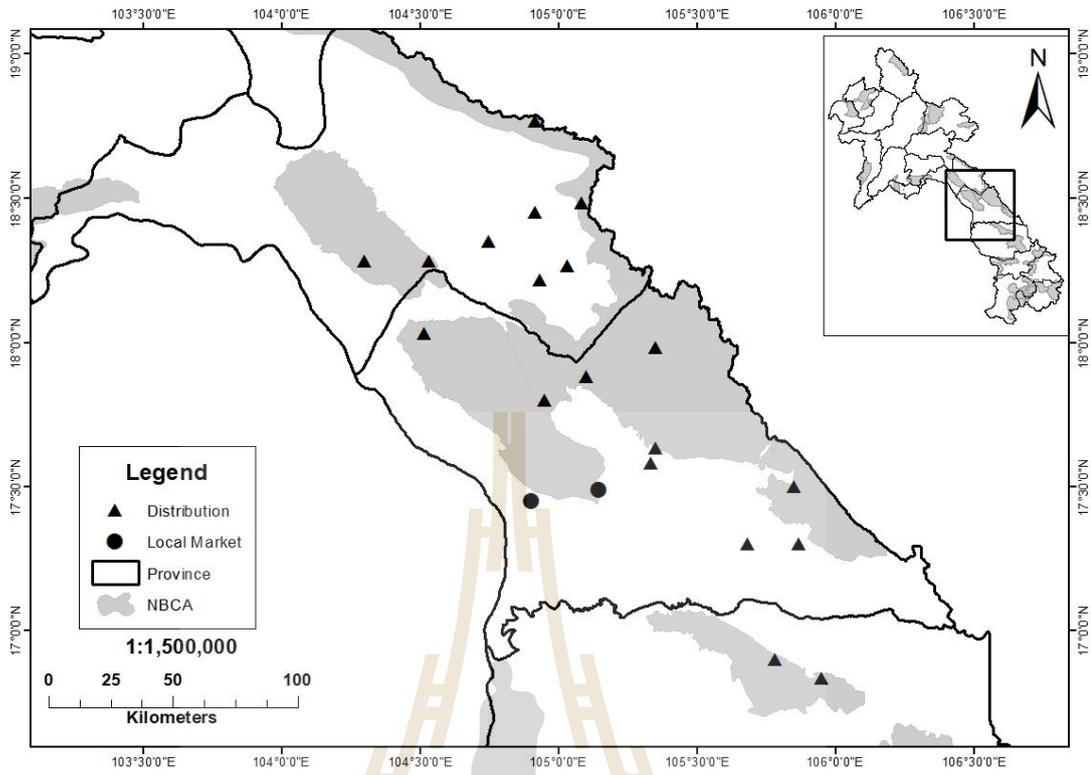


Figure 4.65 The distributions of Hainan blue flycatcher.

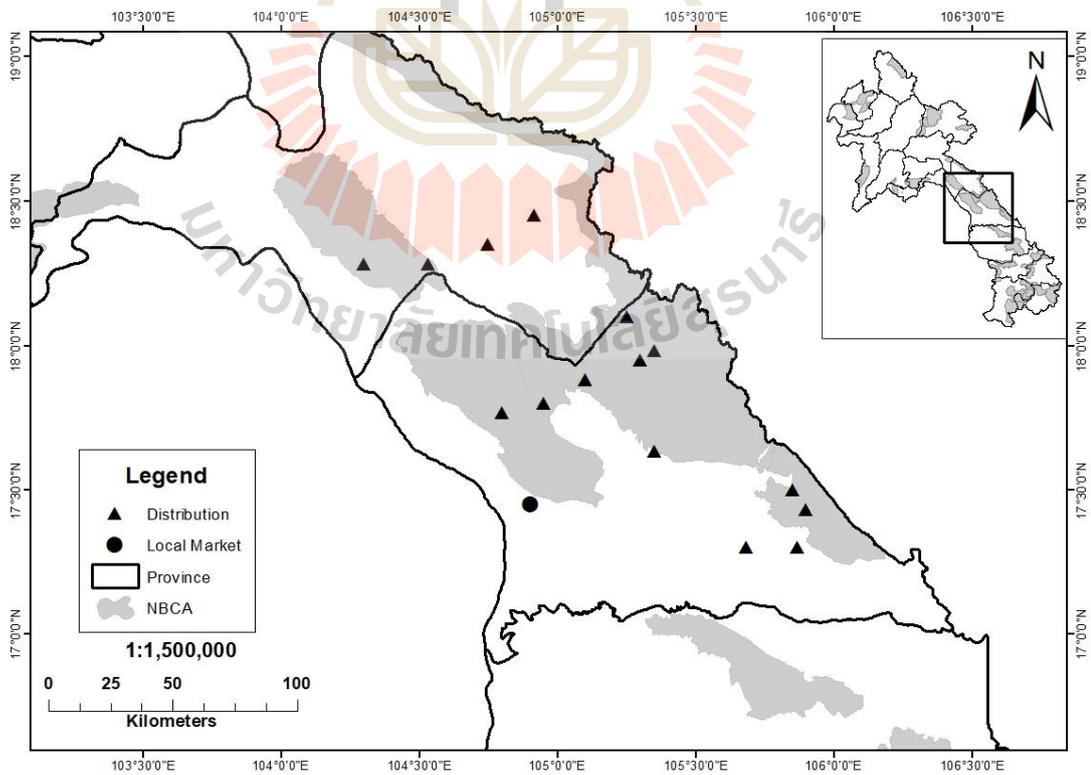


Figure 4.66 The distributions of hill blue flycatcher.

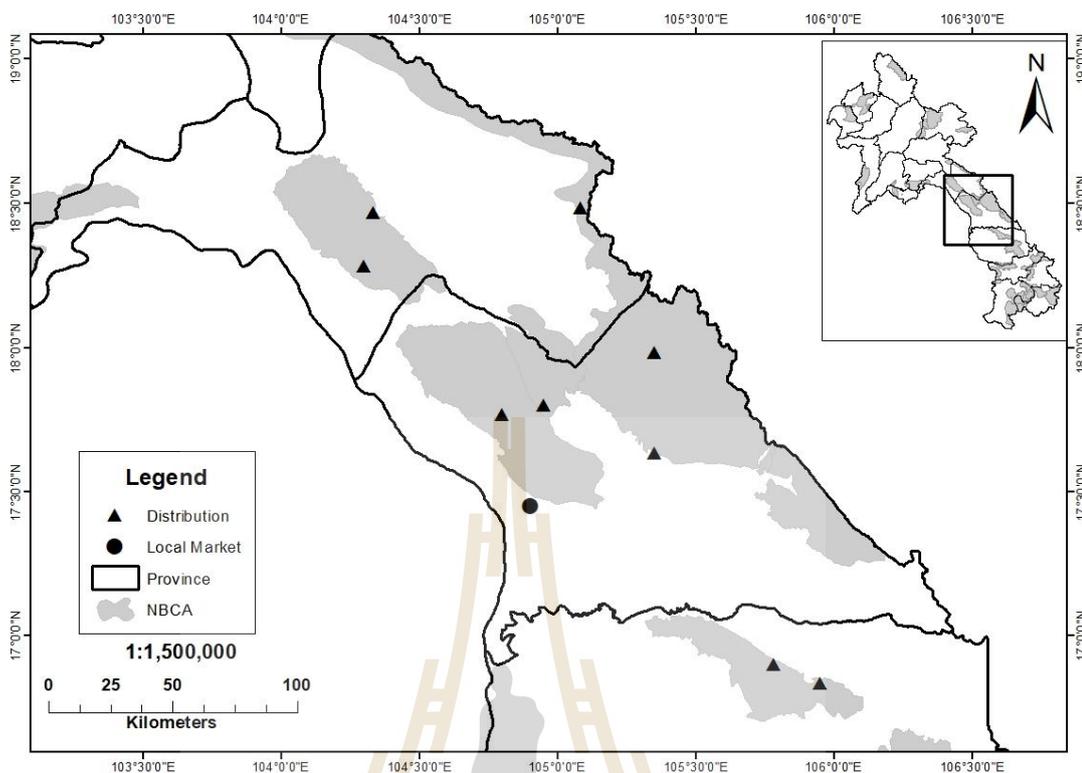


Figure 4.67 The distributions of Siberian blue robin.

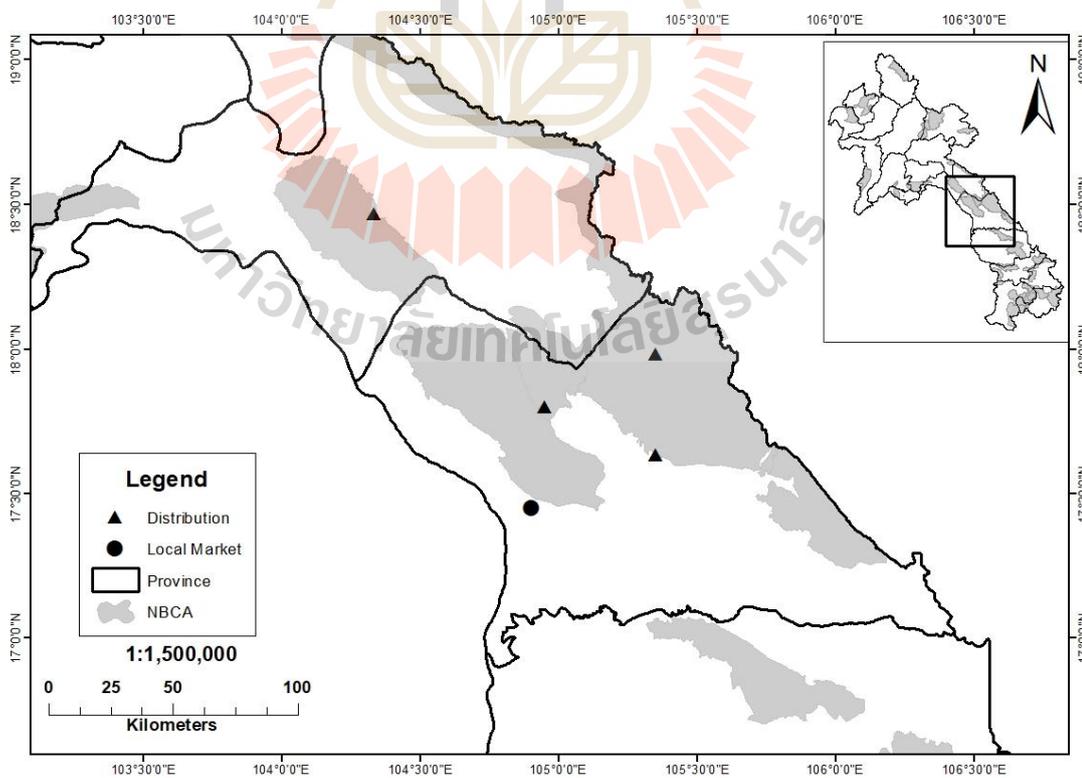


Figure 4.68 The distributions of Siberian rubythroat.

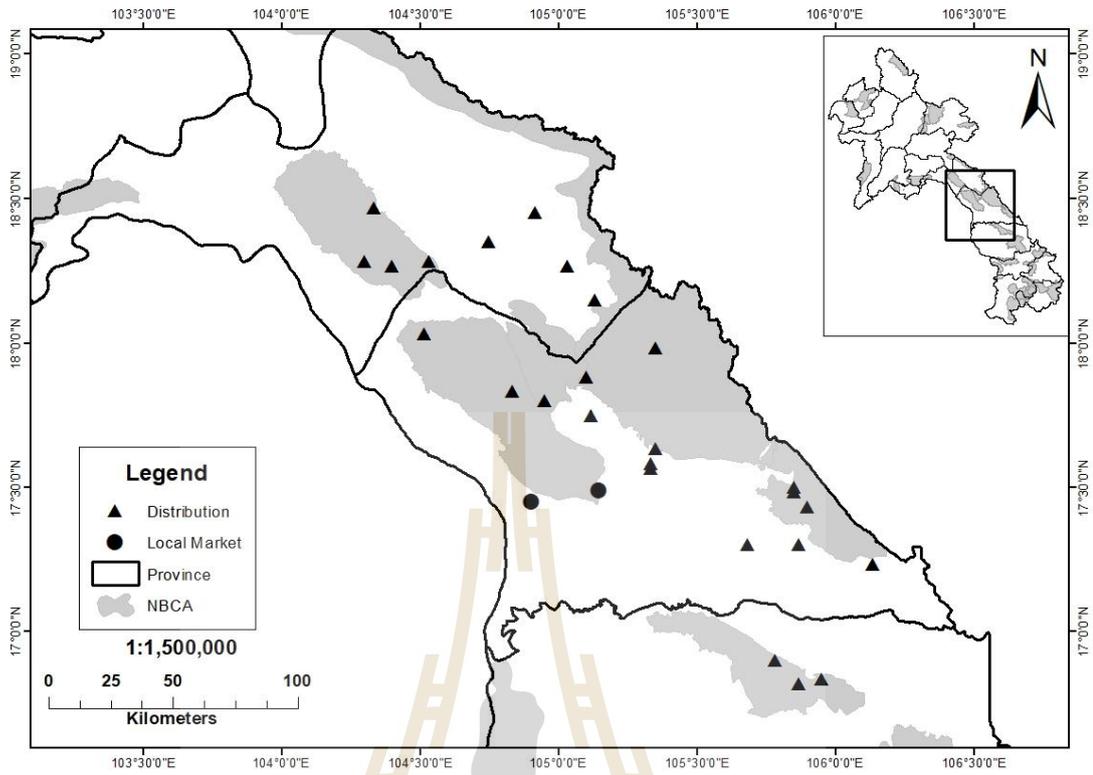


Figure 4.69 The distributions of white-rumped shama.

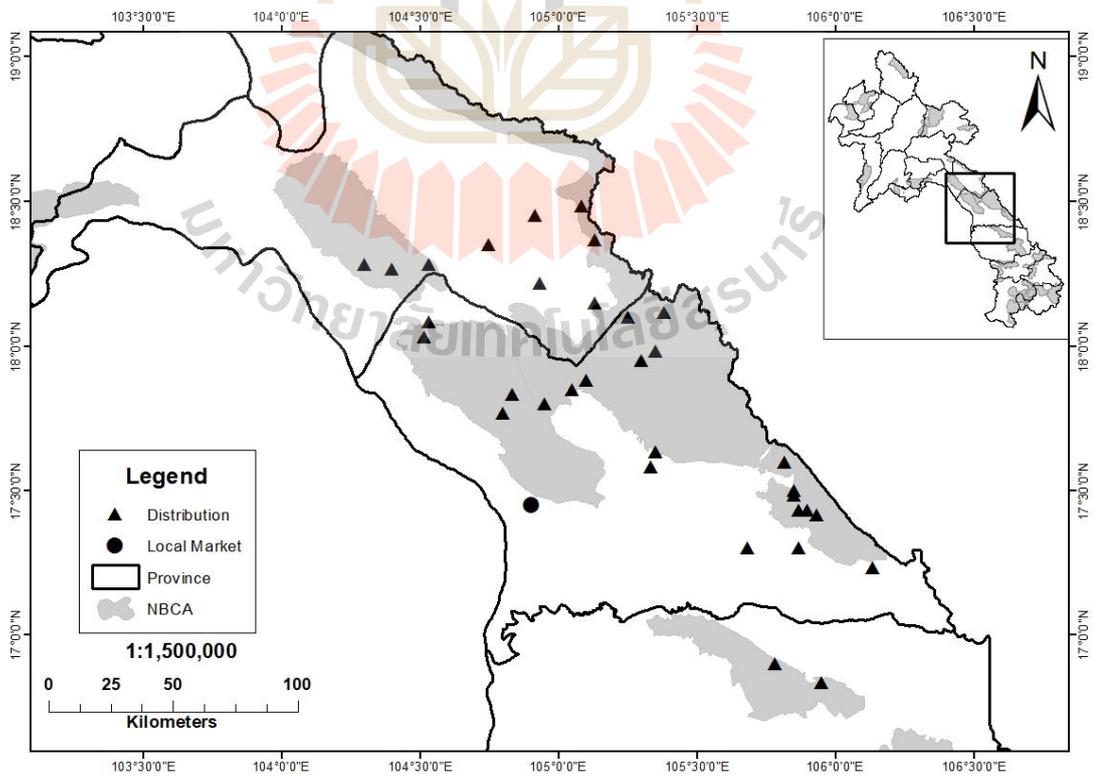


Figure 4.70 The distributions of grey-headed canary-flycatcher.

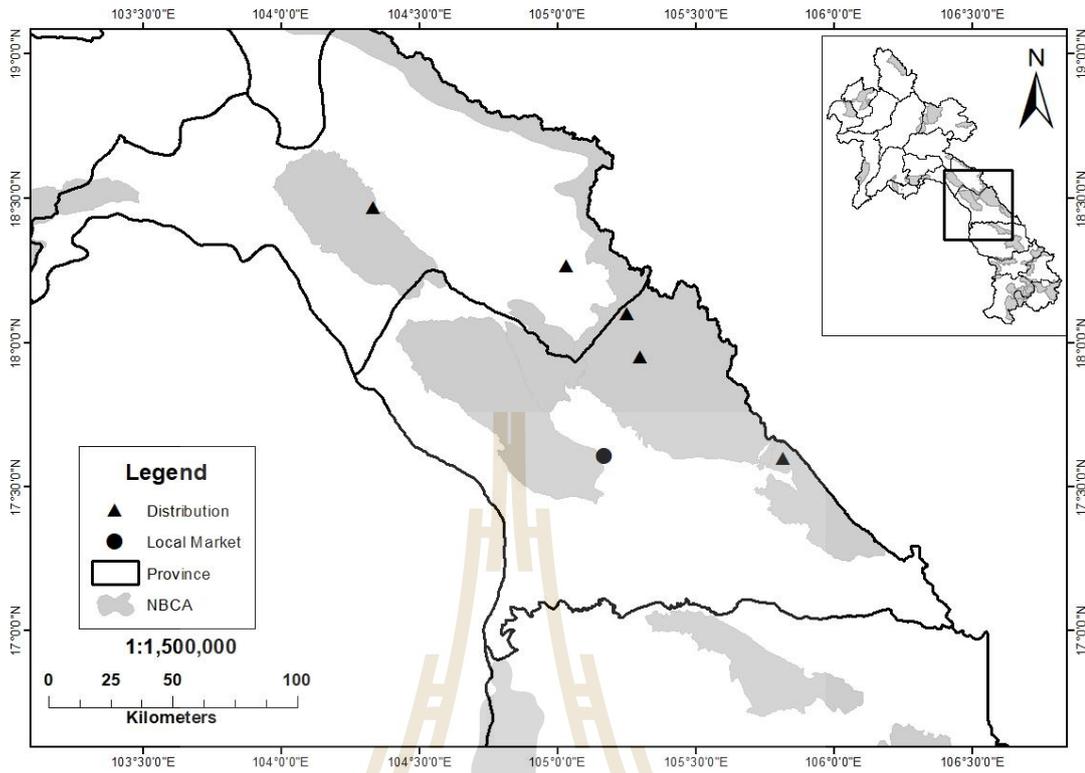


Figure 4.71 The distributions of common myna.

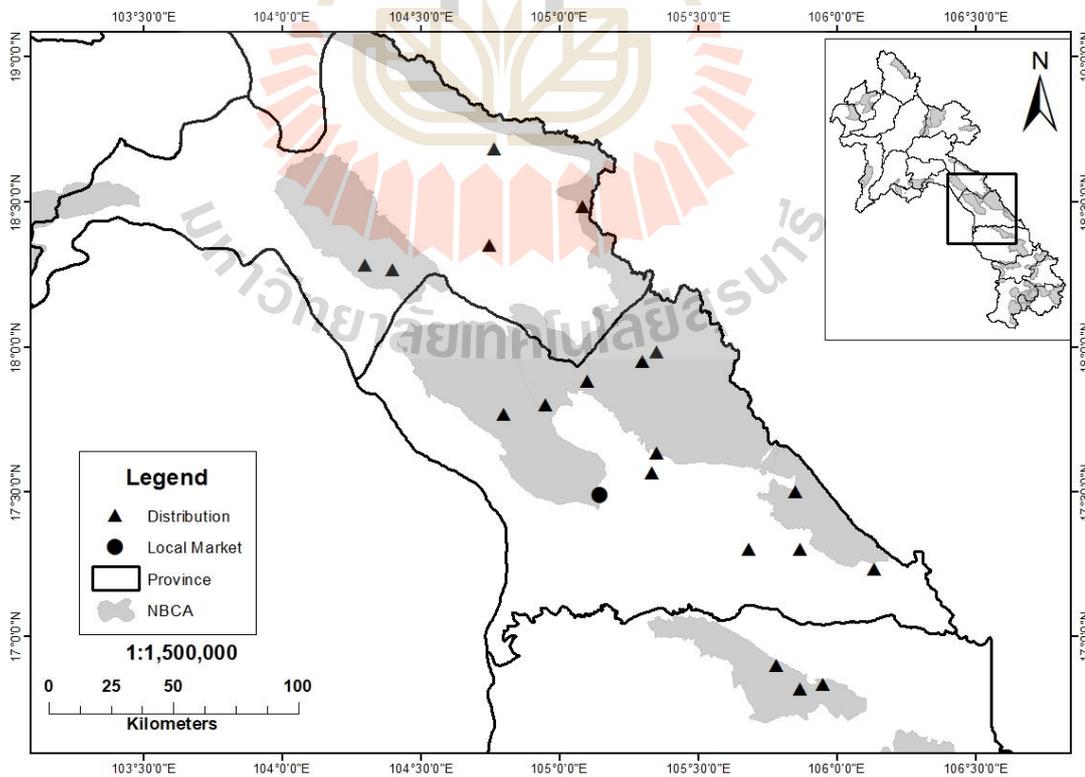


Figure 4.72 The distributions of common hill myna.

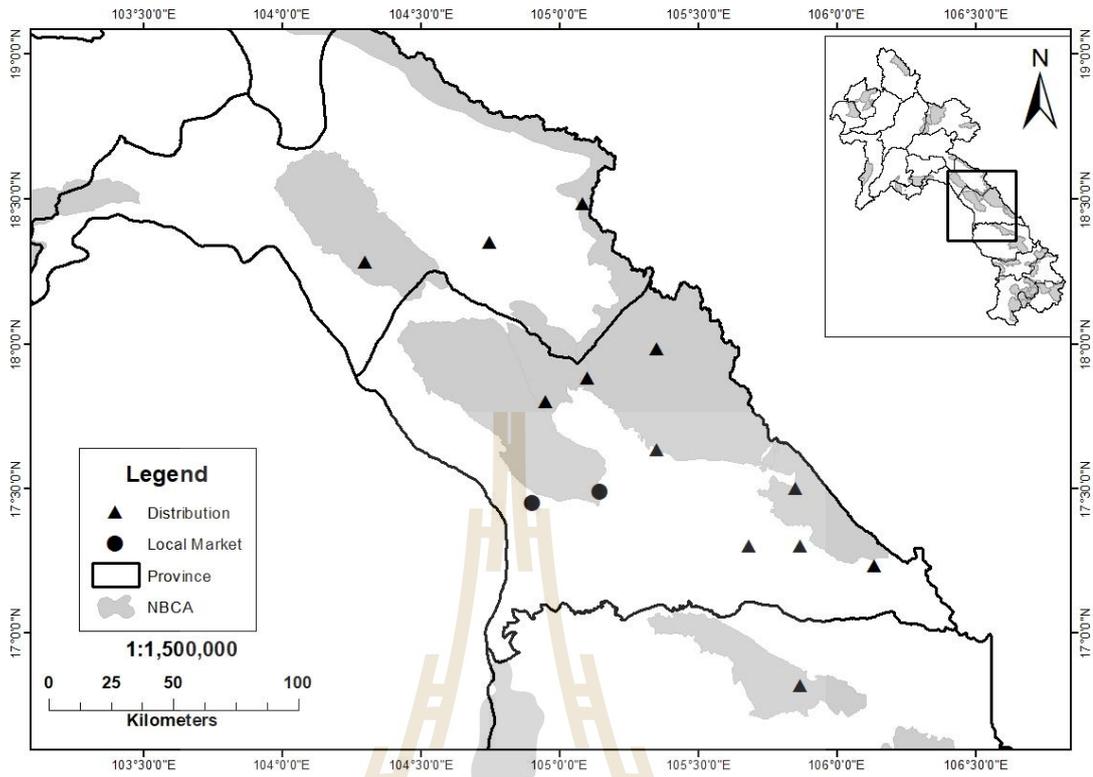


Figure 4.73 The distributions of black-headed bulbul.

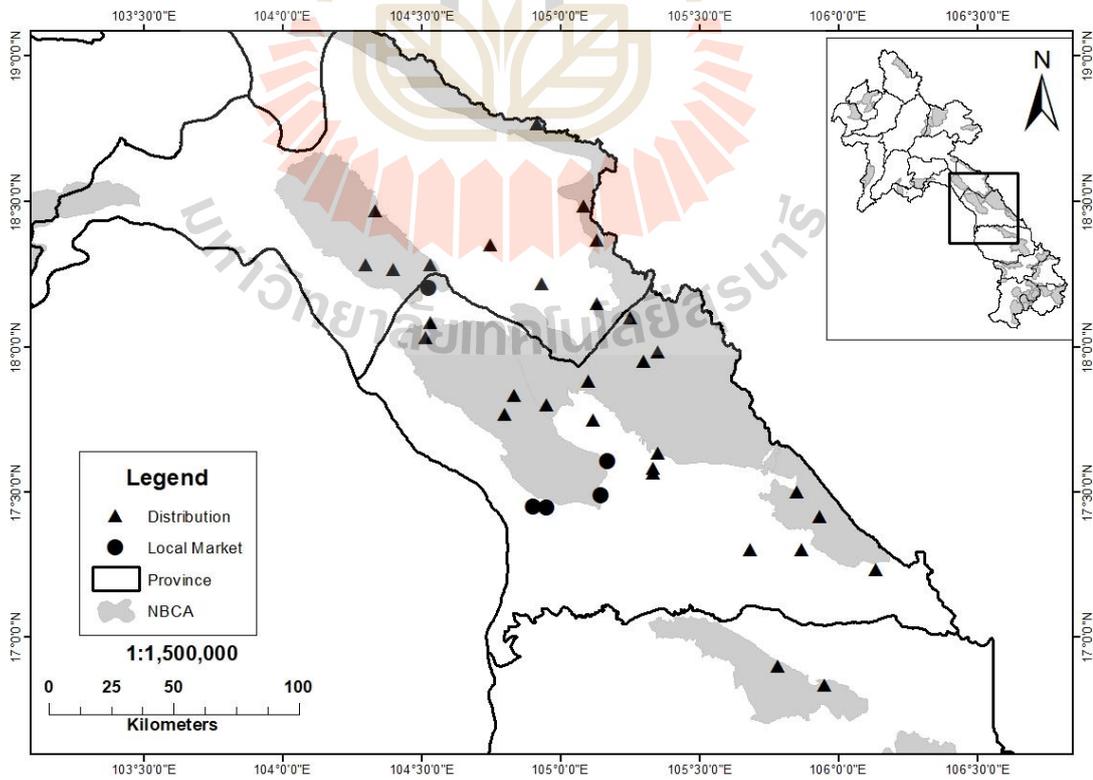


Figure 4.74 The distributions of black-crested bulbul.

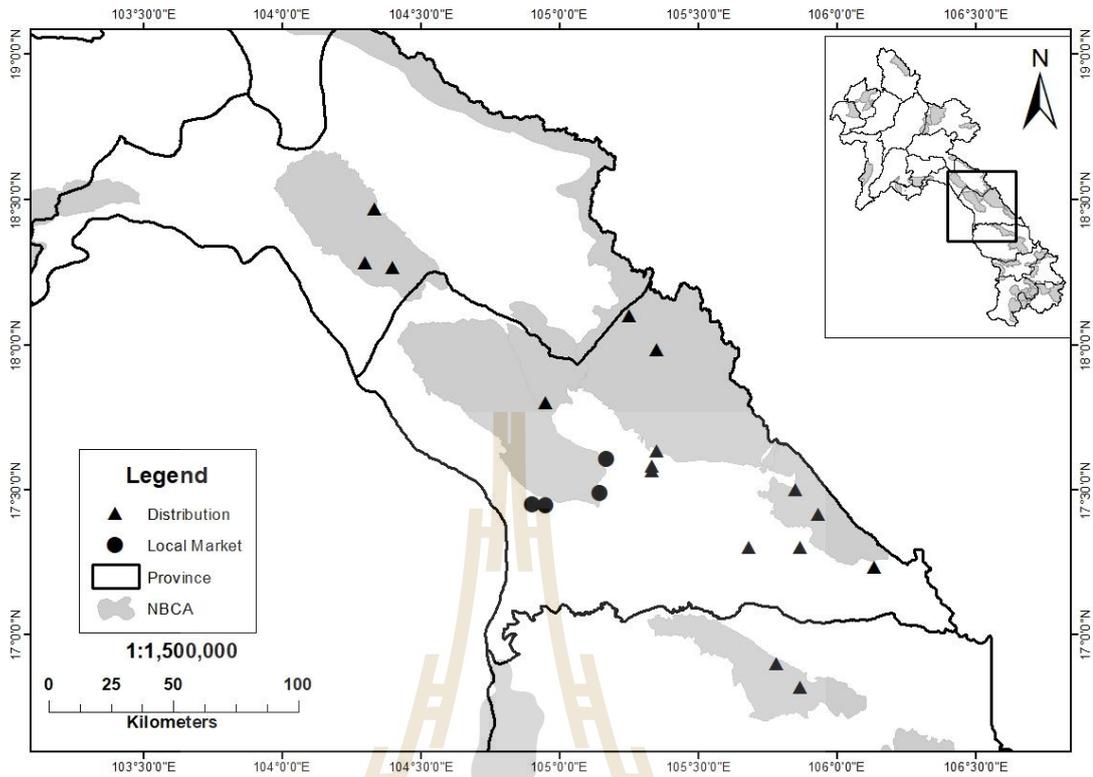


Figure 4.75 The distributions of stripe-throated bulbul.

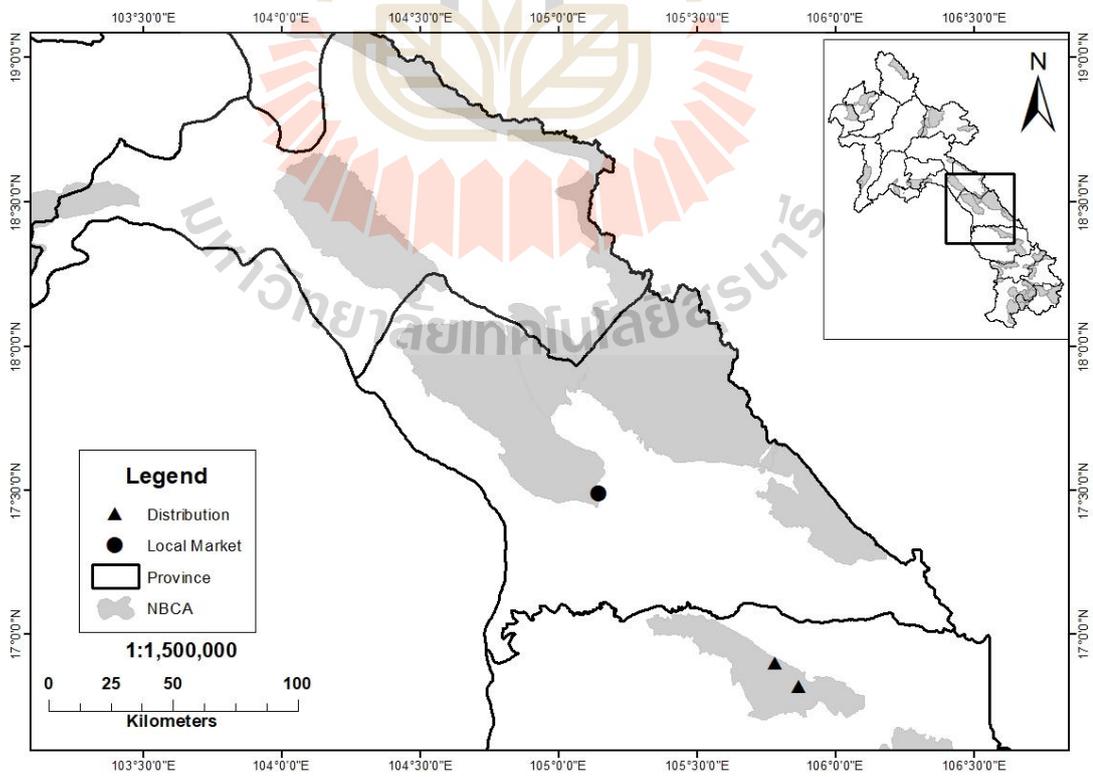


Figure 4.76 The distributions of streak-eared bulbul.

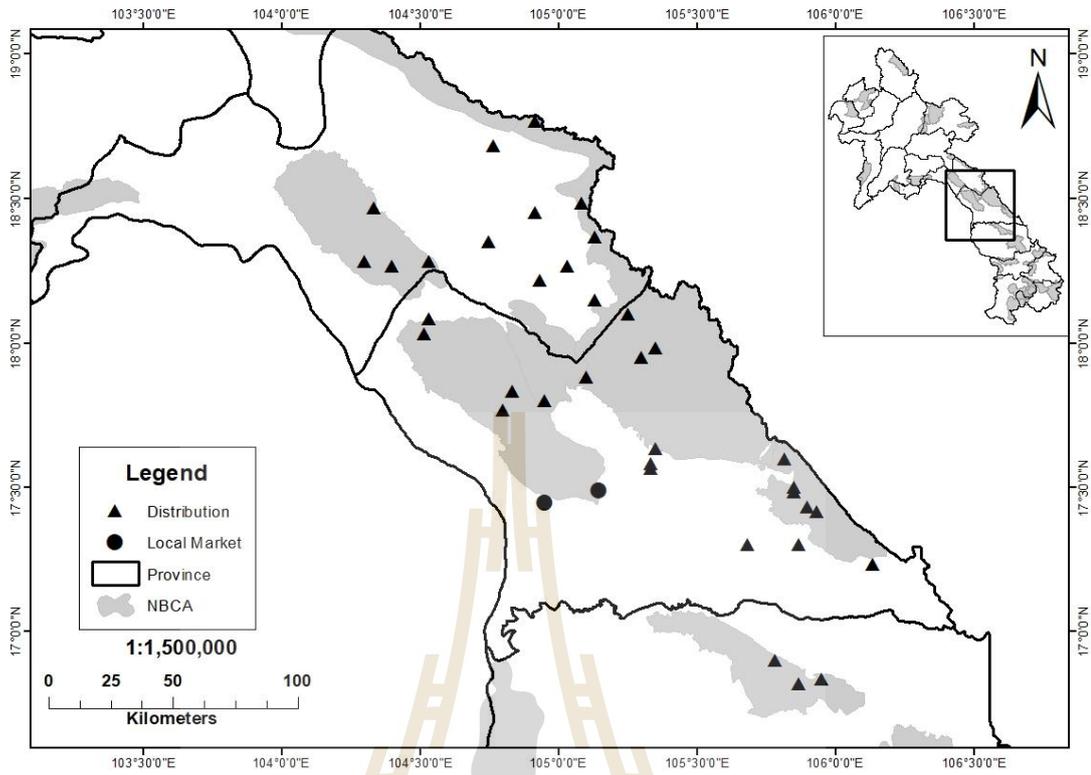


Figure 4.77 The distributions of puff-throated bulbul.

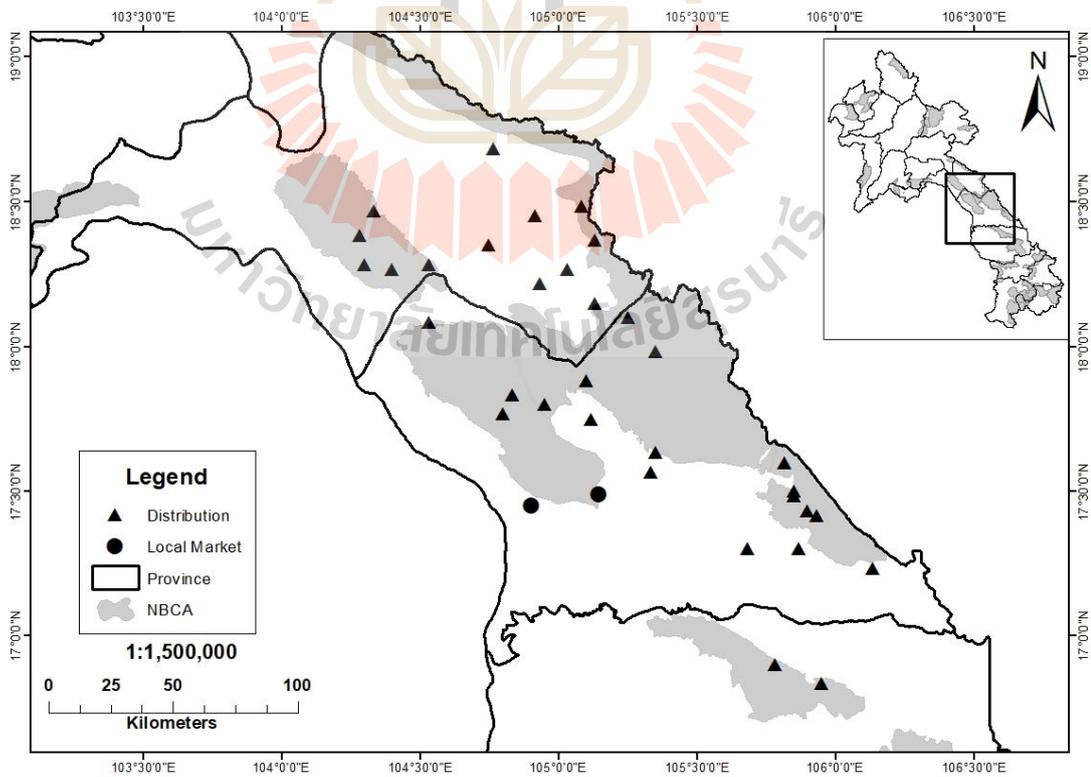


Figure 4.78 The distributions of grey-eyed bulbul.

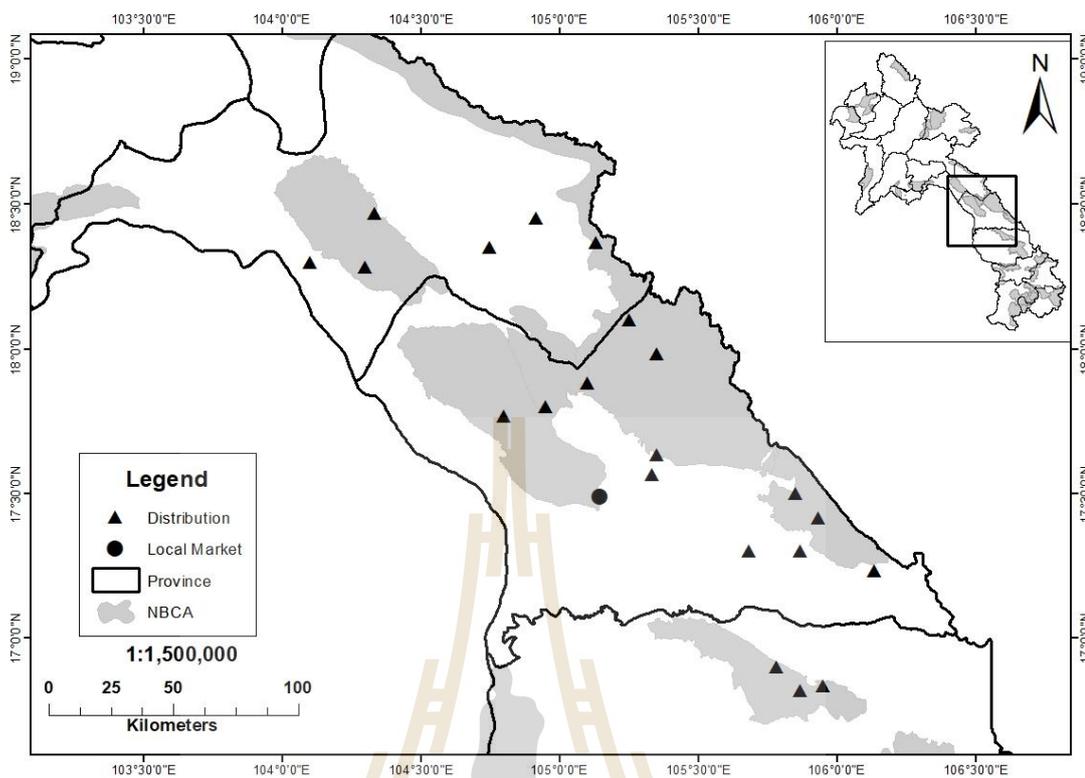


Figure 4.79 The distributions of black bulbul.

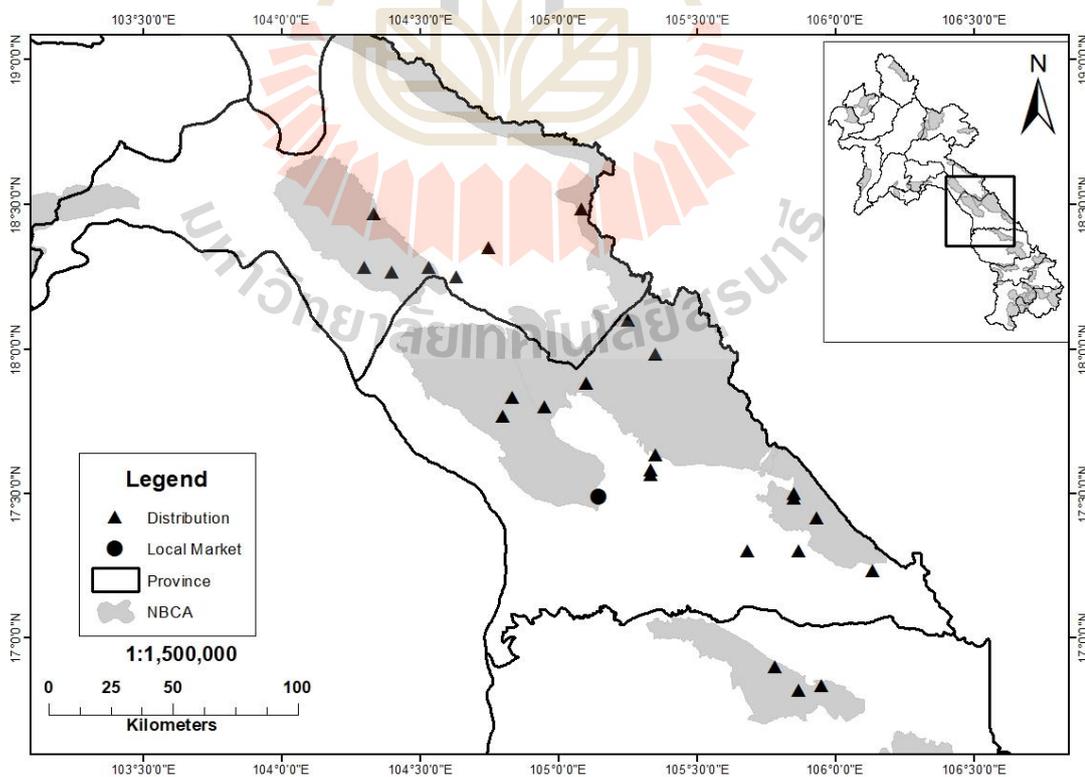


Figure 4.80 The distributions of white-crested laughingthrush.

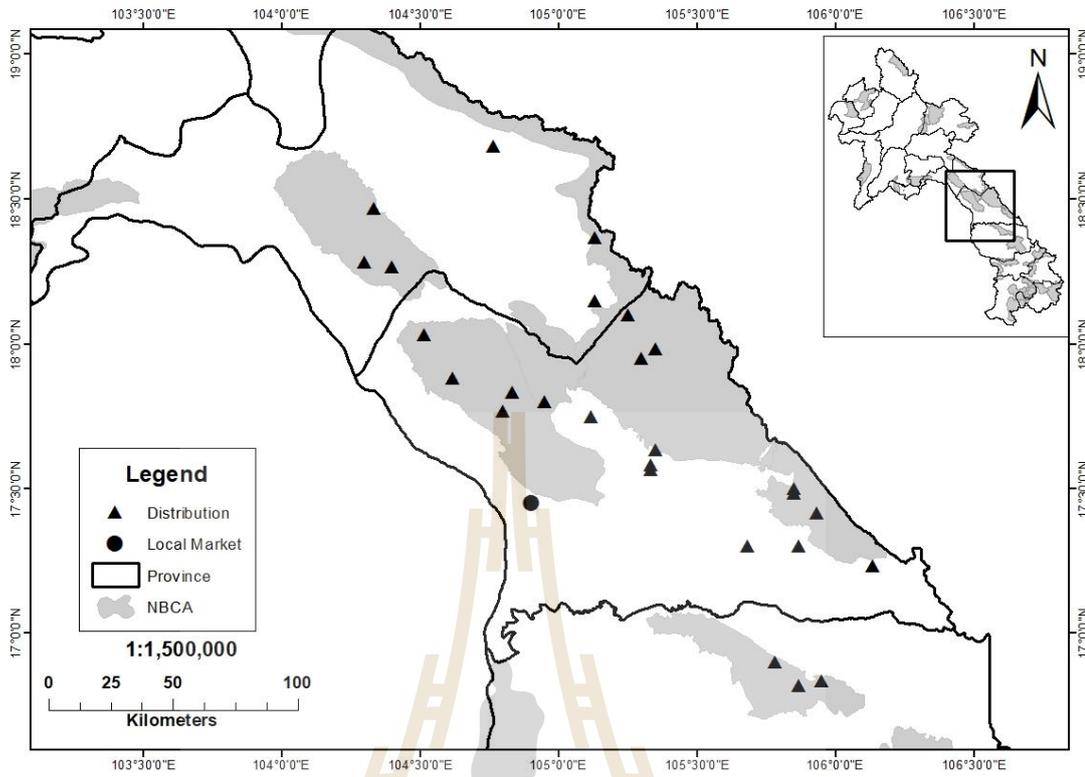


Figure 4.81 The distributions of puff-throated babbler.

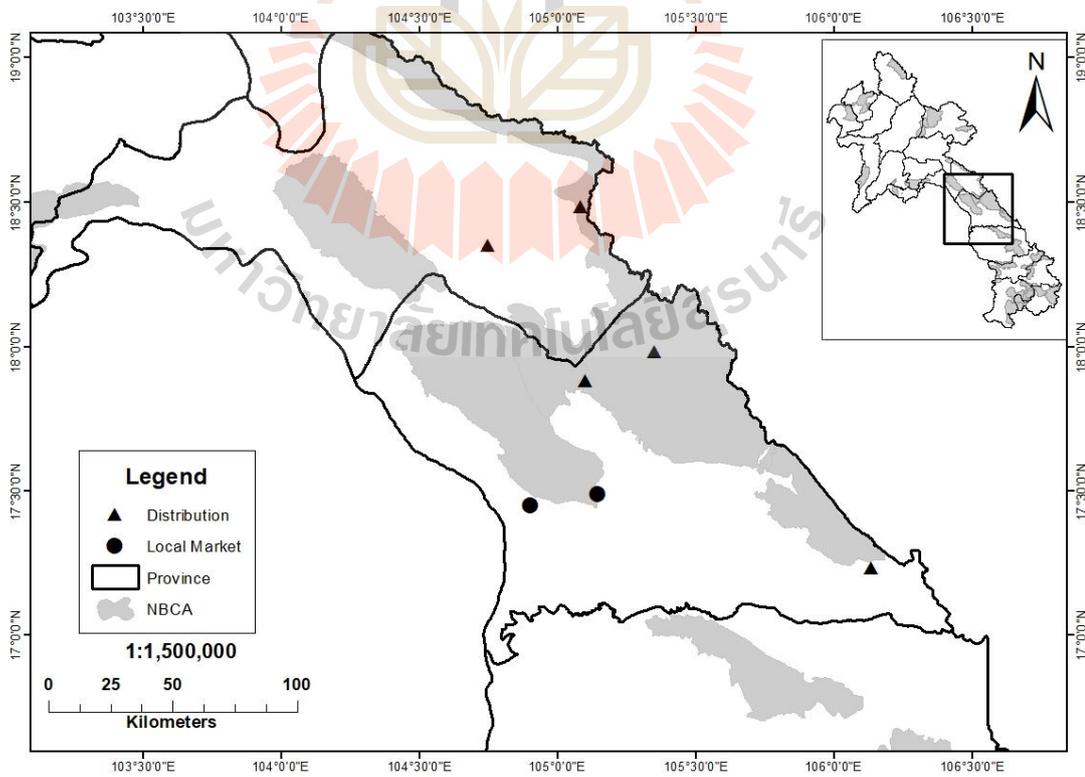


Figure 4.82 The distributions of rufous-fronted babbler.

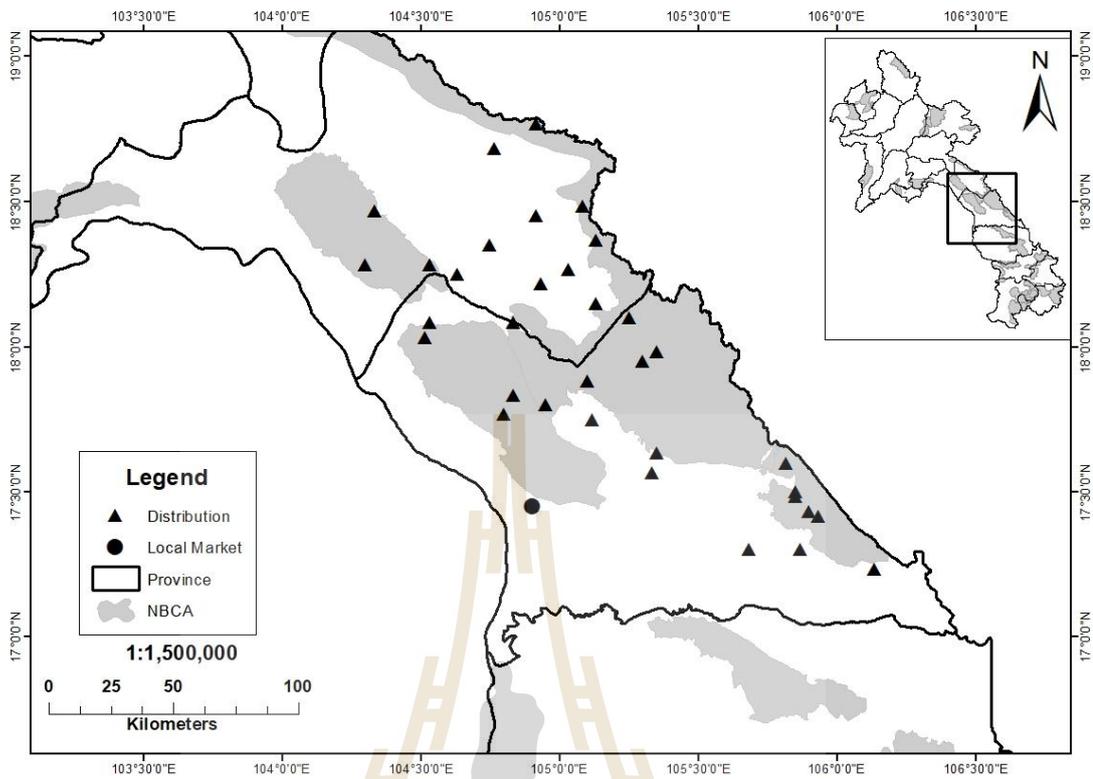


Figure 4.83 The distributions of pin-striped tit babbler.

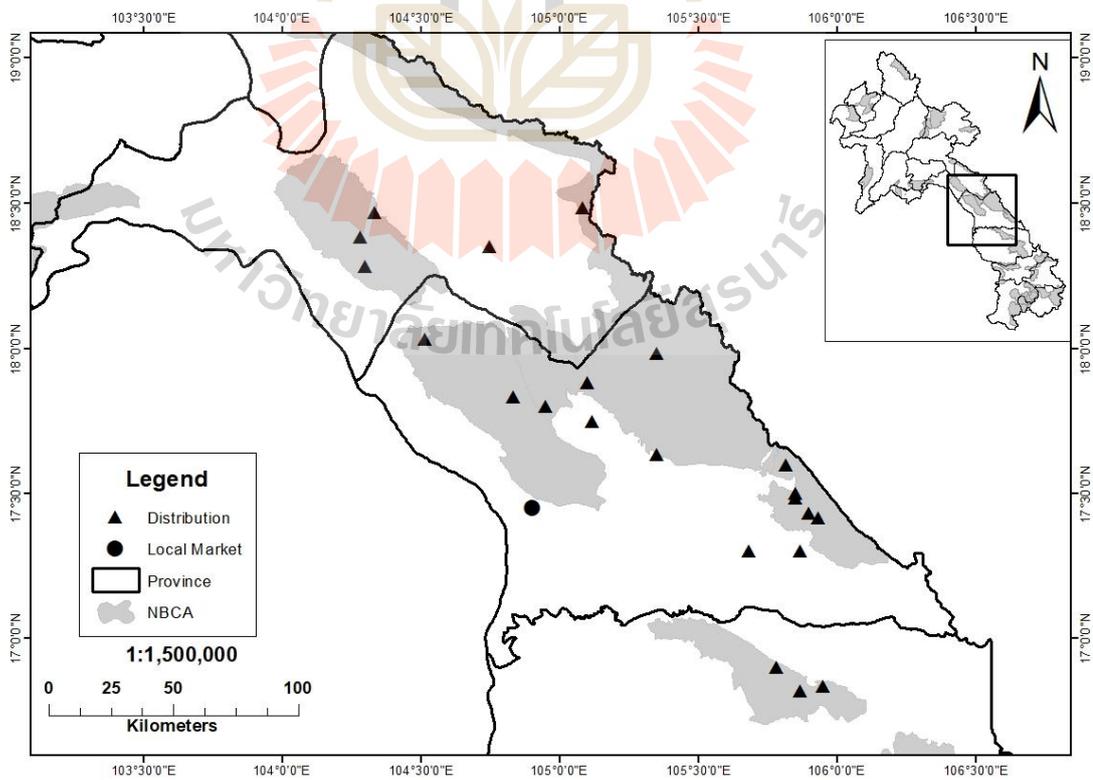


Figure 4.84 The distributions of large scimitar-babbler.

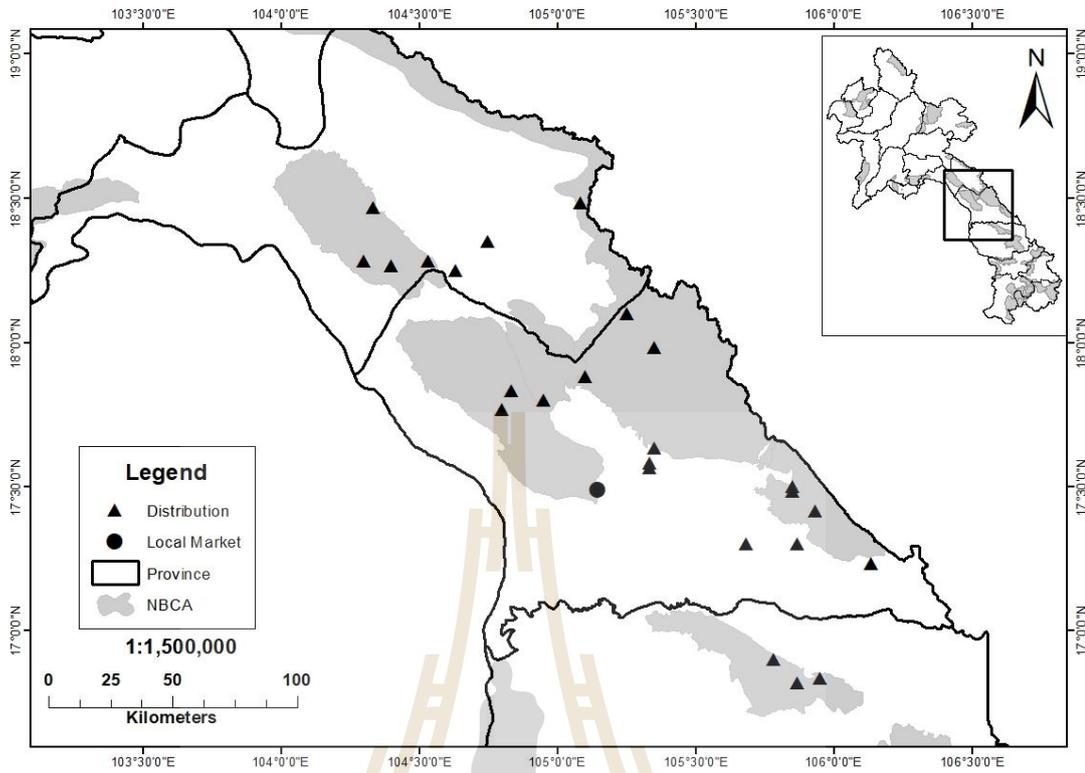


Figure 4.85 The distributions of white-browed scimitar-babbler.

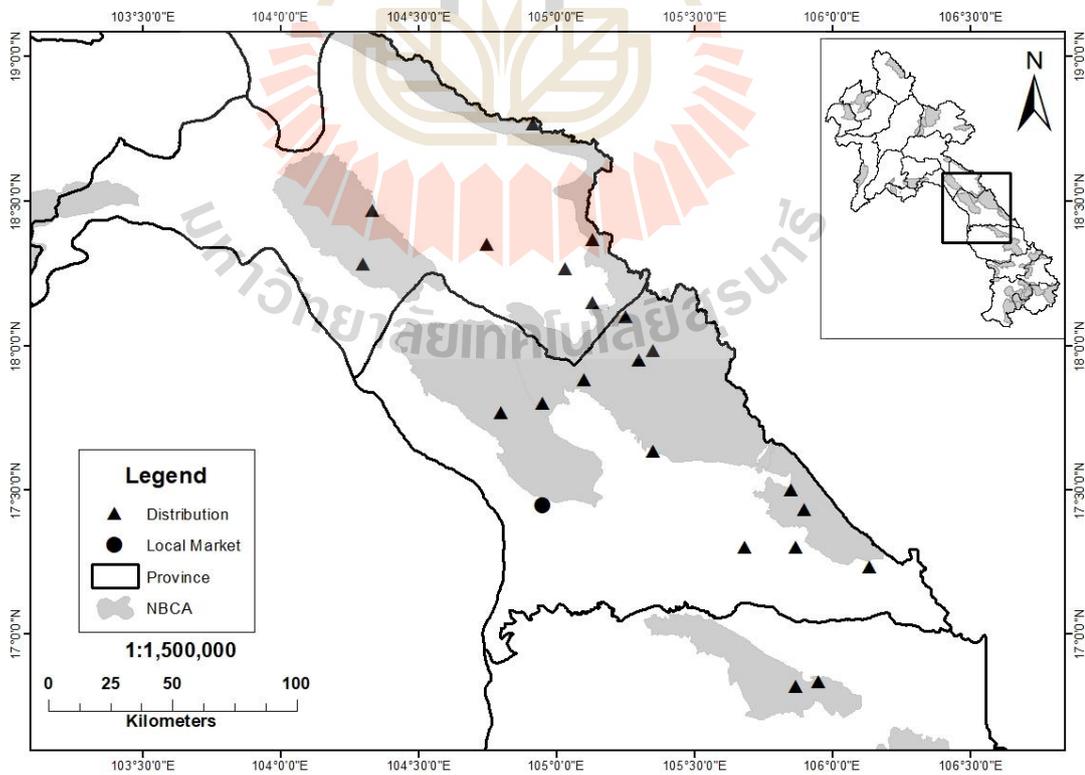


Figure 4.86 The distributions of little spiderhunter.

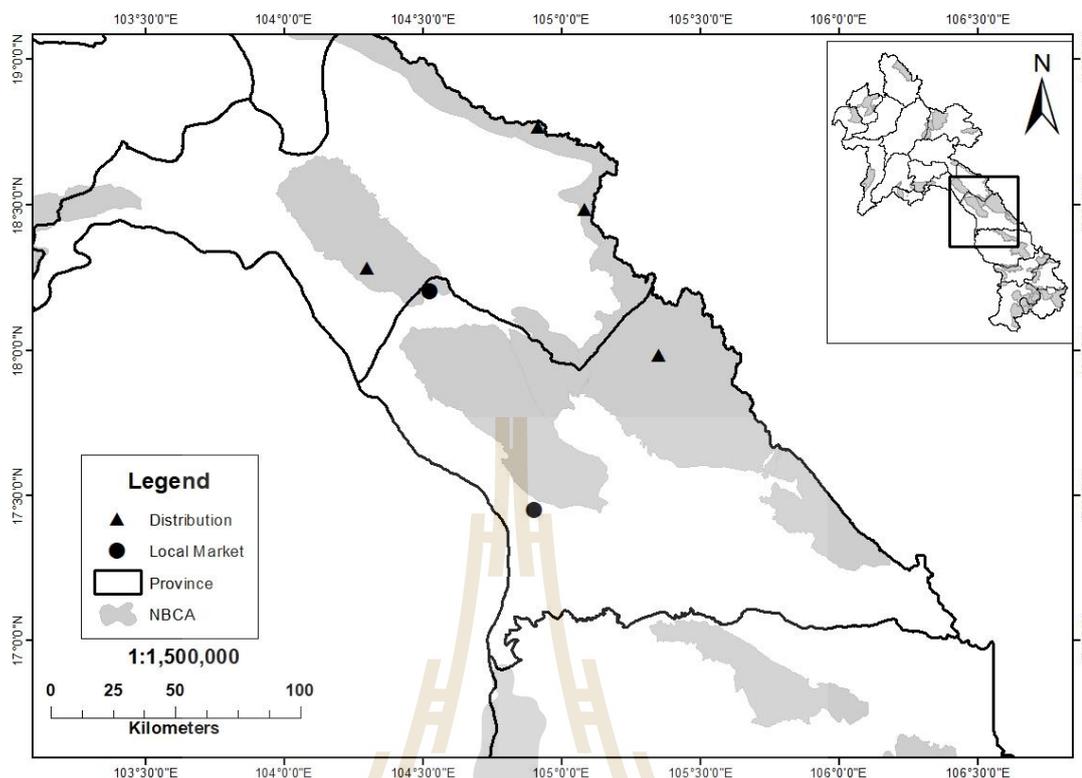


Figure 4.87 The distributions of scaly-breasted munia.

4.5 Discussion

The results show Nakai-Num Theun NBCA was the highest species diversity of bird areas in the central Lao PDR. This is probably because of high number of surveys in the area (Timmins and Evans, 1996; Evans and Timmins, 1998; Tobias, 1998). This NBCA is also classified as global Important Bird and Biodiversity Area (BirdLife International, 2017). In addition, the area supported high threatened bird species (3 Endangered, 9 Vulnerable and 17 Near Threatened) which is about half of threatened species of the country (6 Critically Endangered, 6 Endangered, 15 Vulnerable and 37 Near Threatened) (IUCN, 2017).

The distribution maps of 85 bird species observed from local markets in central Lao PDR show that three species were not recorded from the area including slaty-

backed flycatcher (*F. erithacus*), black bittern (*I. flavicollis*) and barred buttonquail (*T. suscitator*). However, these three species were mentioned in central Lao PDR with no specific location (Duckworth et al., 1999). Most observed birds were previously recorded from the area, which support an idea of birds trade in local markets, may hunt from surrounding areas. The last chapter shows that the number of bird trading in local markets should be higher than present observation due to the number of bird species continue to increase in each observation. This chapter also supported the last chapter because the number of bird species found in the area is nearly six times higher than market observation.

Further study should review bird species and their distributions throughout the country to show their 'hotspot' for further conservation as well as mapping their distribution to show the gaps for further surveys.

4.6 References

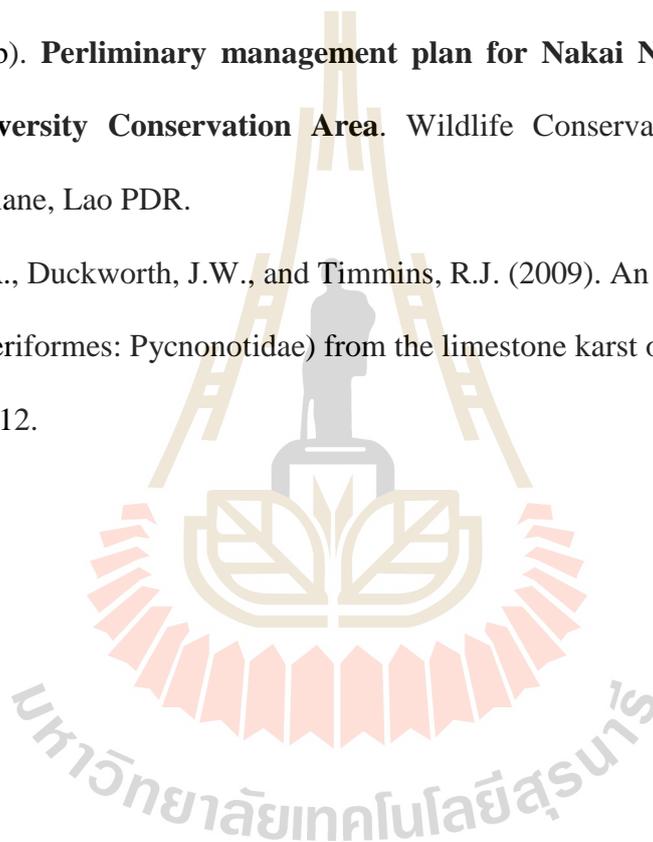
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CHAPTER V

**SOCIO-ECONOMIC PROFILE OF LAO TRADERS,
THEIR PERCEPTIONS, ATTITUDES AND
ACTIONS TO THE BIRD TRADING IN
CENTRAL LAO PDR**

5.1 Abstract

The hotspots of wildlife trade are frequently route at street markets (local markets) which can be seen in several parts of Lao PDR. This study aims to describe the socio-economic profile of Lao traders, their perceptions, attitudes and actions to bird trade in local markets in central Lao PDR. Twenty-nine traders were randomly interviewed in Chout Song and Kok local markets where high number of bird species were found. The results showed that the traders earned averagely US\$ 14.81/day (3.6-60) from bird trade. The demand of birds was for food and pets. Bird trading was found high in dry season (November-May) and low in wet season (June-October). It was reported that the bird trading in local market was hunted from surrounding areas. To conserve the bird, local traders thought that it was a good idea to stop selling and hunting birds while the concerned local officers who check the wildlife trading also gave suggestion and expropriated the wildlife from the traders in these areas. The local traders sold bird for one year up to seven years that some of them never hunted

birds. The result of the study supported the result of field observation and previous studies.

5.2 Introduction

Southeast Asia is a region of the highest rates of deforestation (Sodhi et al., 2004; Duckworth et al., 2012). The rapid destruction of tropical habitats is serious threat to the native biota (Laurance, 1999). Sodhi et al. (2004) suggested that if the rate of deforestation still persists, it could lose three quarters of its original forest cover and about 42% of its biodiversity by the end of this century. Moreover, the region also has high rate of exploitation and consumption of natural resources which affect the biodiversity (Croes, 2012). Currently, biodiversity, especially wildlife were extracted more than six times of its sustainable rate in tropical forest, and at this extraction rate will be no any wildlife resource there for future use (Bennett, 2002).

Currently, consumptions of wildlife are increasing, especially for food, pet and medicine (Croes, 2012). Several parts of wildlife, such as bones, claws, teeth, etc and their meat were used as traditional medicine and food, respectively (Duckworth et al., 1999). Several alive animals are using for pets and merit release, especially song bird (Gilbert et al., 2012; Ragueira and Bernard, 2012).

Additionally, Southeast Asia is considered as the largest wildlife trading hubs (Felbab-Brown, 2011). In 2000, the lizards and snakeskins were legally exported from Indonesia for 29% and 28% of the global exports, respectively. Moreover, 301,905 animal skins were exported from Singapore (Sodhi et al., 2004). Between 1998 to 2007, more than one million individuals of bird were exported from Southeast Asia (Nijman, 2010).

Lao PDR is a hotspot for biodiversity, especially rare and endemic species (Tordoff et al., 2012) which over 1,140 species of wildlife were reported from the country, and more than 700 species are birds (Duckworth et al., 1999). However, the main threats to wildlife in Lao PDR are included clearance of forest habitat for agriculture and consumption of wildlife for food and trade including birds (Duckworth et al., 1999). Traditionally, birds were hunted for food supply of rural people (Hansel, 2004). Currently, birds are hunted for food, but also for local, national and international trade as traditional medicine, decorations and pets (Srikosamatara et al., 1992; Srikosamatara and Suteethorn, 1994; Thewlis et al., 1998; Duckworth et al., 1999; Nooren and Claride, 2001; Bourgeois, 2012; Krishnasamy et al., 2016). Overharvest of wildlife for trading and hunting were seriously to their population declines (Johnson et al., 2003). Illegal and uncontrolled of the wildlife hunting and trading in Lao PDR have been found high risk in worldwide (Singh, 2008). In addition, uncontrolled hunting will cause to population declines and local extinction of many species (Johnson et al., 2003; Corlett, 2007).

As aforementioned, understanding, knowledge, and action of local hunters and traders are significant to sustainable solution in worldwide as well as their future conservation (Croes, 2012). Thus, this study aims to describe the socio-economic profile of Lao traders, their perceptions, attitudes and actions to bird trade in central Lao PDR which is necessary for their future management and conservation.

5.3 Materials and Methods

To describe the socio-economic profile of Lao traders, their perceptions, attitudes and actions to bird trade, traders were interviewed randomly in two local

markets in Khammouane province, Central Lao PDR (Figure 5.1), namely Chout Song and Kok local markets, where high numbers of species of birds were found. Total 29 traders were interviewed, 19 in Chout Song and 10 in Kok local markets by using semi-structured interview (Appendix C) which covered the question on the socio-economic profile of local traders, their perceptions of bird trade, the demand and trend of bird trade in local markets, the main cause of bird trade, bird population decline, bird trade in a month as well as attitudes to bird trading. Additionally, the basic knowledge of illegal bird trading and wildlife monitoring and actions to bird trade were also interviewed. Thus, the finding can show the socio-economic profile of Lao traders, their perceptions, attitudes and actions to bird trade. The information was group into categories and then determined by using Microsoft Excel. The value was converted from Laotian Kip to US Dollar, considering 1 US\$ = 8,156.55 LAK on November 10, 2015.



Figure 5.1 Interview local traders at Kok (left) and Chout Song local markets (right).

5.4 Results

5.4.1 The Socio-economic Profile of Lao Traders

The results show that the highest incomes from bird trade in local markets of Khammouane province, central Lao PDR were US\$ 60 per day and the lowest incomes were US\$ 3.6 per day (Figure 5.2) which almost traders (n=28) responded that incomes from bird trade in local markets improved better livelihood and one trader mentioned it did not improve any his/her livelihood. Therefore, it can be assumed that the main reason of trading birds was high prices of bird and getting higher income than other jobs (n=21), and other reason was seasonal trading which was occurred after rice farming period (n=8). Fourteen traders traded birds for every day and fifteen traded for 1-5 days per week.

5.4.2 Demand and Trends to Bird Trade

From the interview, the demands of wildlife for local traders were birds, mammals, reptiles and other wildlife. It was shown that seventeen traders mentioned birds, thirteen mentioned mammals, ten mentioned reptiles and seven mentioned other wildlife (Figure 5.3). Additionally, most traders (n=26) said that the factors influenced to bird trade of local traders were the demands of customers, fourteen said bird trade season and one said demand of rare species. No local trader mentioned about size and weight of birds. Twenty-three traders said they ordered birds from local hunters every day. However, some traders said a time (n=2) a week, two time a week (n=2), three time a week (n=1) a week and six time a week (n=1).

From the interview, more than half of traders (n=15) said that the populations of birds in the areas were declined, and nine traders said that the population of birds

were still the same as in the past. However, a trader mentioned that bird populations were increased, and four could not estimate their population trend.

5.4.3 Perceptions to Bird Trade

Traders (n=26) mentioned that bird trade has been currently increased dramatically from the past due to high demand, both for food supply and trade, which caused the population of many species declines. In addition, some traders (n =11) also said that the population of birds declined because of overharvest including hunting and loss of habitats.

The traders reported that most of customers bought birds for food (n=27), following that for pets (23); for beauty and voice (n=16); for traditional medicine (n=3) and other (n=1), respectively (Figure 5.4).

From the interviews, twelve traders answered that birds were highly traded in April and May, eleven traders answered in March, nine answered in February, six answered in December, five answered in November, three answered in January and June and two answered in July to October (Figure 5.5). In contrast, eighteen traders said that birds were not highly traded in local market in June, six traders said in July, five said in August to October, three said in May, two said in February and one said in January, March, November and December.

Bird trade in local markets was reported to hunt in surrounding areas, especially the NBCAs and their adjacent areas, such as near Chout Song village, near Kok village, Mahaxay district, Xayphothong district, Thakek district, near Nam Dix village, and Nam Phao near the Lao-Vietnamese border. Local hunters suggested that most birds were hunted on trees of *Ficus* spp., *Xerospermum* sp, *Grewia* sp and *Diospyros* sp.

Most traders (n=27) mentioned that hunting birds caused the population decline of birds, but two traders mentioned no any cause to their population decline due to some birds were annually seen, such as black-crested bulbul (*Pycnonotus flaviventris*), white-crested laughingthrush (*Garrulax leucolophus*), red junglefowl (*Gallus gallus*), eastern spotted dove (*Spilopelia chinensis*), grey-capped emerald dove (*Chalcophaps indica*), greater coucal (*Centropus sinensis*).

5.4.4 Attitudes to Bird Trade

All traders understood that bird trade is illegal because many species of birds are prohibited species and nearly extinction. They also understood that they should conserve the birds because they will extinct if without any conservation. To conserve the birds, it needs to stop hunting including for food, trade and pets as well as keeping the nature.

Local officers who are responsible for wildlife protection were monitored illegal wildlife traders fourteen traders said once a month, ten traders said twice a month, and fifteen traders said three times a month, respectively. Each time of monitoring, local officers expropriated all wildlife seeing in local markets and also gave the suggestion to traders.

5.4.5 Actions to Bird Trade

It was found that traders have been trading for different length of time, one year (n=7), two years (n=5), three years (n=8), four years (n=6), five years (n=1), six years (n=1), and seven years (n=1), respectively. Most traders (n=24) did not hunt birds, but ordered birds from hunters and some traders (n=5) also hunted birds by themselves.

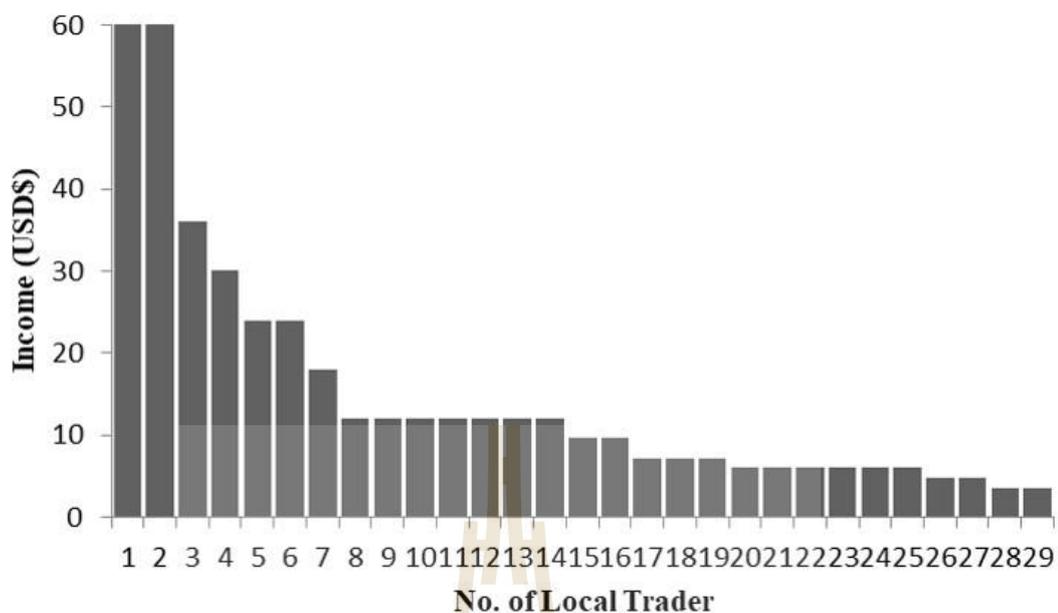


Figure 5.2 The income from bird trade in local markets in central Lao PDR of each trader.



Figure 5.3 Demand of birds and other wildlife for trade in local markets, central Lao PDR.

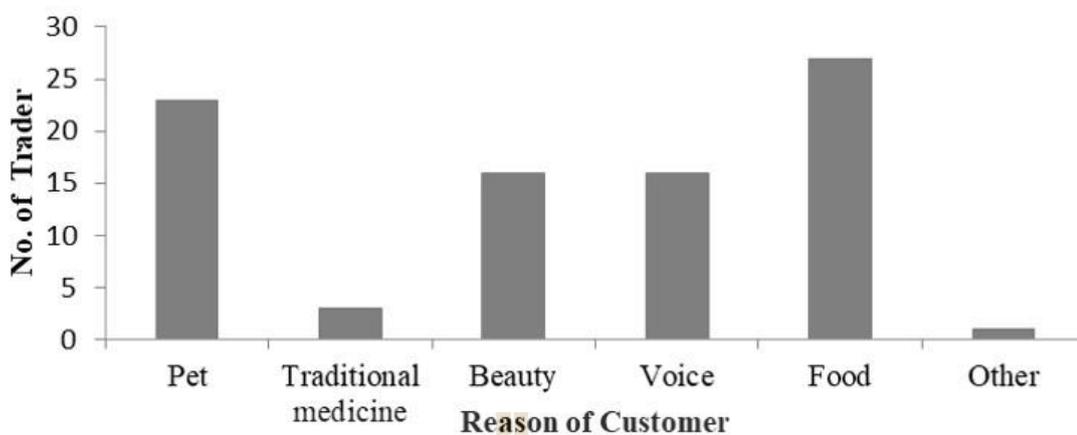


Figure 5.4 The perception of customers that why they buy birds, central Lao PDR.

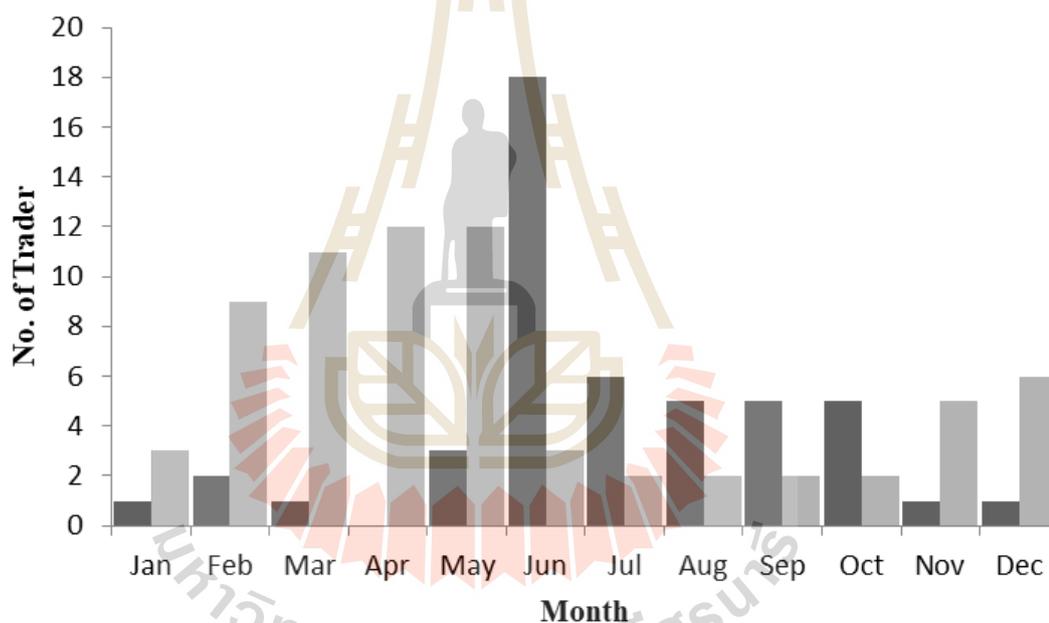


Figure 5.5 The lowest (black colour) and the highest (grey colour) of bird trade in local markets in each month, central Lao PDR.

5.5 Discussion

The results of the study demonstrate that income of bird trade average of US\$ 14.81 (3.6-60) a day, approximately around US\$ 5,405.65/year. However, Srikosamatara et al. (1992) reported income of bird trade averagely US\$ 17.11/day

and around 6,245.15/year in That Louang fresh market. In comparison, it shows that the income of bird trade in the previous study is higher than this study due to most bird species found in the previous study were larger size so the prices were more expensive than the birds in the present study (see Chapter III; Srikosamatara et al., 1992). The findings show that the price of birds depended on the body size, rare, alive, dead, beauty and song birds (Chapter III) as the study of Regueira and Bernard (2012). The findings of this research and of Croes (2012) show that incomes of wildlife trading improve livelihood of local people, so they can send their children to schools.

The demand of birds for food, trading, pets were found (Duckworth et al., 1999; Nooren and Claridge, 2001; Srikosamatara and Suteethorn, 1994; Hansel, 2004). The present study also found the same.

From interview, birds were reported high trade in February to May and low trade on June to January. This relates to field observation which also found high number of birds, as well as number of species, in February and April and low number in June to November (see Chapter III). Srikosamatara et al. (1992) also found that the number of species and individuals of birds were found high trade in dry season (January-April) and low trade in wet season (August-October). They suggested that the number of bird trade was low in wet season due to this period is Buddhist lent period (Kao Phan Sa) which few local people hunted animal in this period due to their believe of Buddhism.

The local traders understood that trading bird is illegal trade. Currently, rural villagers can hunt common bird species for their food supply, but hunting of protected species and hunting for trade are prohibition (Krahn and Johnson, 2007; Sautner et al.,

2002). However, birds, as well as other wildlife, have normally been found trade in local markets in several parts of the country (Singh, 2008). Singh (2008) also suggested that rare species or protected species of birds were hidden under table in local market. From field observation, most found bird species in local markets are common species (see Chapter III) and only one species is classified as Appendix II in CITES (CITES, 2017) and 28 species are classified in Lao Wildlife and Aquatic Law (The Forestry Division, 2009). According to Lao Wildlife and Aquatic Law, the utilization of animal catalogued as prohibition and management categories shall be controlled and permitted by government (National Assembly, 2007). However, the law enforcement is complicated for very sensitive ethnic people (Srikosamatrara et al., 1992). In addition, it seems that traders do not worry about possibility of inspections and punishments, but they concern on the inefficiency of the local law enforcement and absent of the punishment to offenders (Regueira and Bernard, 2012).

In conclusion, this study was the first time interviewed the local traders of bird trade in local markets of Khammouane province, central Lao PDR. It provides an understanding of local traders on wildlife trade in Lao PDR which is important for wildlife trade control and conservation.

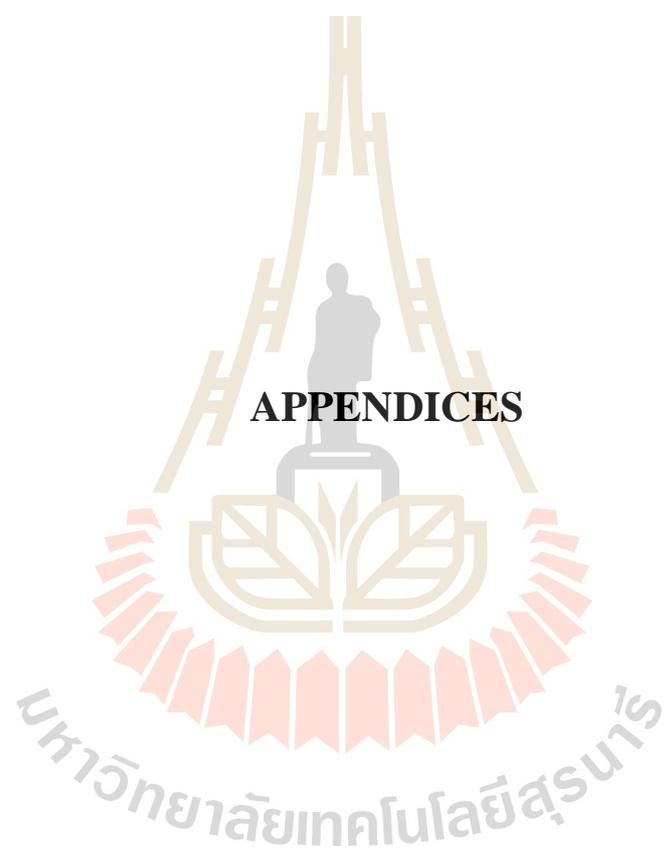
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APPENDICES

มหาวิทยาลัยเทคโนโลยีสุรนารี

APPENDIX A

THE SEVERAL SPECIES OF BIRD TRADING IN LOCAL MARKETS OF BOLIKHAMXAY AND KHAMMOUANE PROVINCES, CENTRAL LAO PDR.



Figure 3.8 Asian barred owlet.



Figure 3.9 Asian fairy bluebird.



Figure 3.10 Barred buttonquail.



Figure 3.11 Barred cuckoo-dove.



Figure 3.12 Besra.



Figure 3.13 Blue pitta.



Figure 3.14 Blue-rock-thrush.



Figure 3.15 Common hill myna.



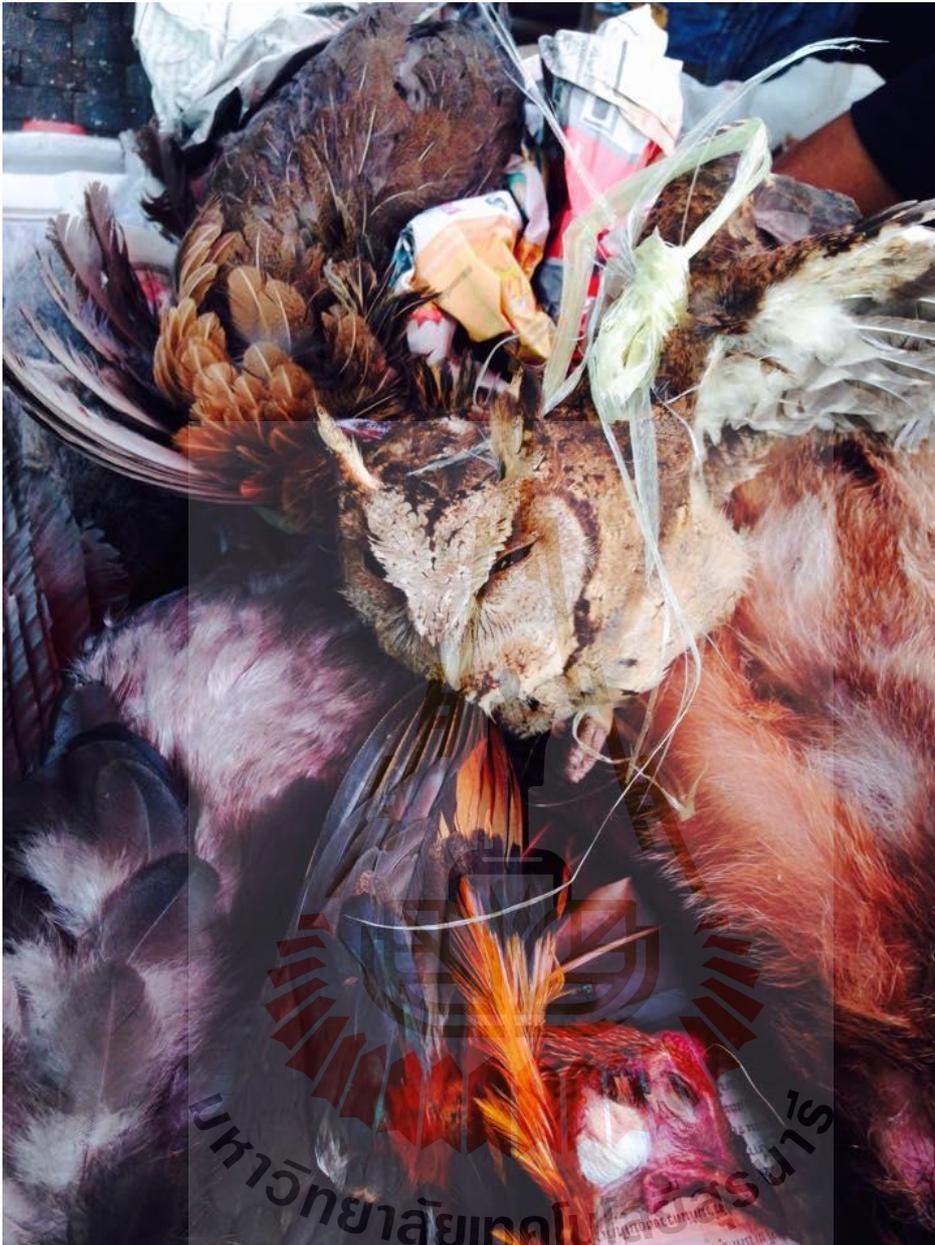


Figure 3.16 Collared scops-owl, both male and female of red junglefowl, and squirrel species.



Figure 3.17 Eastern spotted dove.



Figure 3.18 Greater coucal.

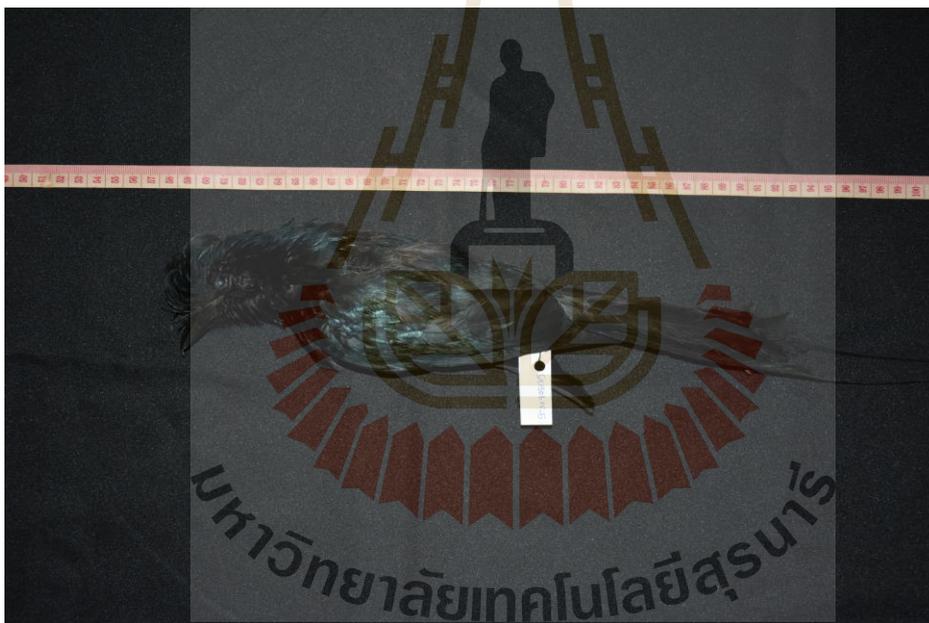


Figure 3.19 Greater racket-tailed drongo.



Figure 3.20 Hair-crested drongo.



Figure 3.21 Laced woodpecker.

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Figure 3.22 Lined barbet and mushrooms below.



Figure 3.23 Oriental bay-owl.



Figure 3.24 Purple heron, cinnamon bittern, common moorhen, and little heron.



Figure 3.25 Red junglefowl, silver pheasant, squirrel species, civet species, rat species, blue-winged leafbird and bulbul species.

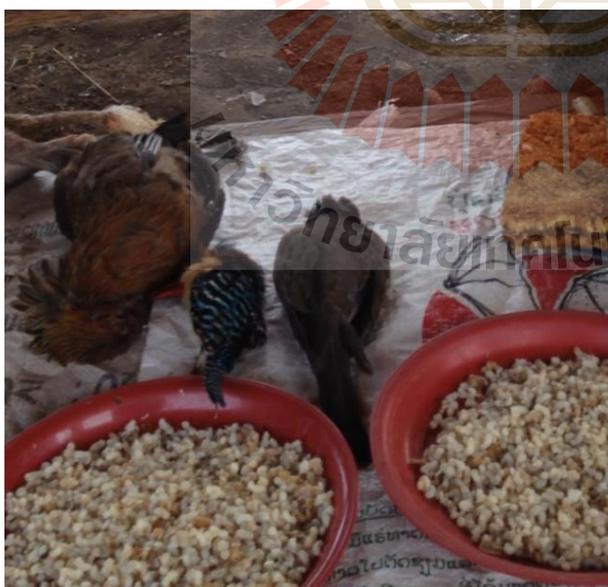


Figure 3.26 Red junglefowl (left), banded kingfisher (center), and eastern spotted dove (right).



Figure 3.27 Rufous-winged buzzard.



Figure 3.28 Scaly-breasted partridge.



Figure 3.29 Siamese fireback (both male and female).



Figure 3.30 Silver pheasant and small mammals (left) and silver pheasant, mushrooms, and natural products (right).



Figure 3.31 Thick-billed green-pigeon.



Figure 3.32 White-crested laughingthrush.



Figure 3.33 Yellow-vented green-pigeon, coppersmith barbet, squirrel species, and natural products.



APPENDIX B

GAZETTEER

This study

Chout Song local market, Khammouane Province, 17°27'9.74"N, 104°54'10.01"E

Chout Neouang local market, Khammouane Province, 17°26'53.91"N, 104°57'6.35"E

Kok local market, Khammouane Province, 17°29'28.03"N, 105° 8'46.67"E

Phouthavong local market, Khammouane Province, 17°36'28.48"N, 105°10'9.52"E

Khounkham local market, Khammouane Province, 18°12'20.34"N, 104°31'30.55"E

Lak Sao local market, Bolikhamxay Province, 18°11'7.94"N, 104°58'32.60"E

Thong Pei local market, Bolikhamxay Province, 18°18'28.53"N, 105° 5'13.03"E

Na Pei local market, Bolikhamxay Province, 18°18'7.37"N, 105° 4'4.08"E

Phou Xang He NBCA

Phou Xang He, 16°53'60.00"N, 105°46'60.00"E, Thewlis et al. (1995)

Scrub, cultivation etc, 16°49'0.00"N, 105°52'0.00"E, Thewlis et al. (1998)

Phou Hinho, 16°49'60.00"N, 105°56'60.00"E, Thewlis et al. (1998)

Hin Namno NBCA

North Houay Talee, 17°36'0.00"N, 105°49'0.00"E, Thewlis et al. (1998)

North, 17°31'0.00"N, 105°50'0.00"E, Thewlis et al. (1998)

North degraded, 17°28'60.00"N, 105°50'60.00"E, Thewlis et al. (1998)

South degraded, 17°25'60.00"N, 105°52'0.00"E, Thewlis et al. (1998)

South Houay Pan, 17°25'60.00"N, 105°54'0.00"E, Thewlis et al. (1998)

North Houay Clocc, 17°25'0.00"N, 105°55'60.00"E, Thewlis et al. (1998)

West, 17°18'0.00"N, 105°40'60.00"E, Walston and Vinton (1999)

Central, 17°18'0.00"N, 105°52'0.00"E, Walston and Vinton (1999)

South-east, 17° 13.000'N, 106° 10.000'E, Thewlis et al. (1998)

Nakai-Nam Theun NBCA

Nakai-Nam Theun NBCA, 17°58'60.00"N, 105°20'00.00"E, Thewlis et al. (1998)

Central mountains over, 17°56'60.00"N, 105°17'60.00"E, Thewlis et al. (1998)

Nam Kwai, 18°22'0.00"N, 105° 7'60.00"E, Thewlis et al. (1998)

Wet forest logging road, 18°16'0.00"N, 105° 1'60.00"E, Thewlis et al. (1998)

Sayphou Loyang, 18°13'0.00"N, 104°55'60.00"E, Thewlis et al. (1998)

Ban Nakadok forest, 18° 8'60.00"N, 105° 7'60.00"E, Thewlis et al. (1998)

Middle Nam Xot, 18° 6'0.00"N, 105°15'0.00"E, Thewlis et al. (1998)

Nam Xot, 17°51'0.00"N, 105° 2'60.00"E, Thewlis et al. (1998)

Nam Mon, 17°52'60.00"N, 105° 6'0.00"E, Thewlis et al. (1998)

Ban Lakkhao, 17°45'0.00"N, 105° 7'0.00"E, Timmins (1997)

Western plateau forest, 17°37'60.00"N, 105°20'60.00"E, Thewlis et al. (1998)

Southern mountains, 17°34'60.00"N, 105°19'60.00"E, Thewlis et al. (1998)

Southern escarpment, 17°35'0.00"N, 105°19'60.00"E, Thewlis et al. (1998)

Phou Laoko, 18°10'0.00"N, 105°25'0.00"E, Thewlis et al. (1998)

Cypress forest, 18°7'0.00"N, 105°22'60.00"E, Thewlis et al. (1998)

Nakai Plateau

Nakai Plateau, 17°48'0.00"N, 104°57'0.00"E, Evans and Timmins (1998)

Phou Hin Poun NBCA

Khammouane Limestone, 17°46'0.00"N, 104°47'60.00"E, Evans and Timmins (1998)

Central forest area, 17°49'60.00"N, 104°49'60.00"E, Thewlis et al. (1998)

Northern enclave, 17°52'60.00"N, 104°37'0.00"E, Thewlis et al. (1998)

Nam Hai/Hinboun plain forest, 18° 2'0.00"N, 104°31'0.00"E, Thewlis et al. (1998)

Ban Vangdao, 18° 4'60.00"N, 104°32'0.00"E, Thewlis et al. (1998)

Nam Hai/Nam Hinboun, 18° 4'60.00"N, 104°49'60.00"E, Thewlis et al. (1998)

Northern Extension

Nam Theun Extension, 18°21'0.00"N, 104°45'0.00"E, Evans and Timmins (1998)

Nam Pan, 18°26'60.00"N, 104°55'0.00"E, Thewlis et al. (1998)

Nam Chat, 18°28'60.00"N, 105° 4'60.00"E, Thewlis et al. (1998)

Upper Nam Cham valley, 18°46'0.00"N, 104°55'0.00"E, Thewlis et al. (1998)

Middle Nam Heun/lower Nam Cham, 18°40'60.00"N, 104°46'0.00"E, Thewlis et al. (1998)

Nam Kading NBCA

Nam Kading below NBCA, 18°22'60.00"N, 104°17'0.00"E, Thewlis et al. (1998)

Inundation area, 18°18'0.00"N, 104° 6.000"E, Thewlis et al. (1998)

Nam Kading NBCA forest, 18°17'0.00"N, 104°17'60.00"E, Thewlis et al. (1998)

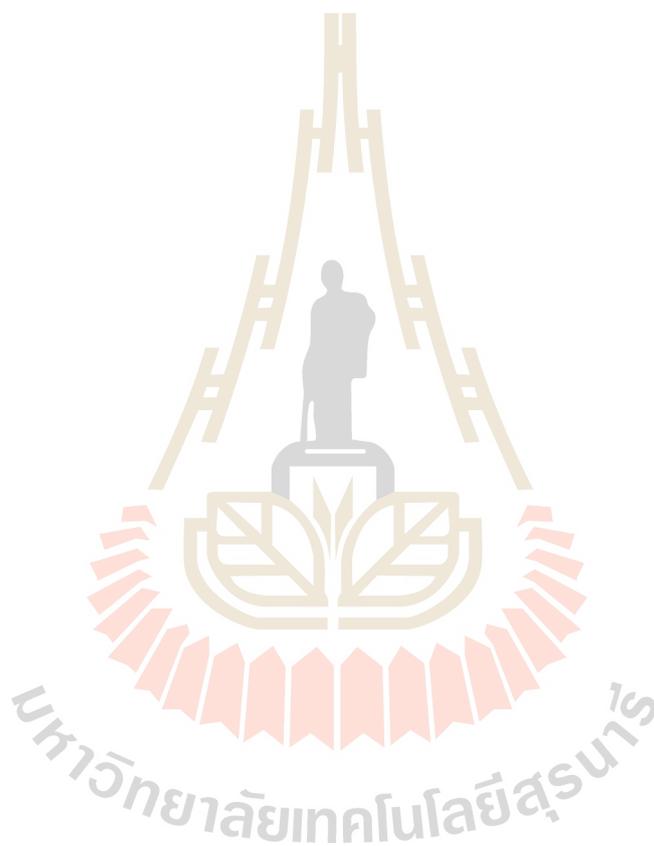
Nam Ao forest, 18°16'0.00"N, 104°24'0.00"E, Thewlis et al. (1998)

Upper Nam Gnouang/lower Nam Heun, 18°15'0.00"N, 104°37'60.00"E, Thewlis et al. (1995)

Nadee limestone, 18°17'0.00"N, 104°32'0.00"E, Thewlis et al. (1998)

Nam Kading NBCA river, 18°25'0.00"N, 104°34'60.00"E, Thewlis et al. (1998)

Scrub, 18°28'0.00"N, 104°20'60.00"E, Duckworth et al. (1998)



APPENDIX C

THE INTERVIEW FORM OF BIRD AND WILDLIFE TRADES

Date:.....

Interviewer:.....

Place:.....

1) Sex: Man Woman

2) Age:

3) How many people are there in your family? Woman?

.....
.....

4) Job: farmers gardeners sellers staffs

Others.....

5) What is your main reason to sell birds?

.....
.....

6) How much money do you earn for selling birds per time?

.....
.....

7) How many days per week do you trade birds?

.....
.....

8) The income from birds trade improves your life?

.....
.....

9) How long have you been a trader?

.....
.....

10) Which the factors influence to bird trade?

- Seasonal
- Rare species
- Demand of customers
- Bird weight

11) How long do you find bird for trade?

.....
.....

12) Do you usually sell bird?

.....
.....

13) In 5-10 years ago, how do you think the bird trade trend?

- Increased
- Decreased
- Stable
- I don't Know

14) In several years ago, which kind of animals do you often sell?

- Mammalians

- Birds
- Amphibians
- Reptilians
- Others

15) Does birds trade change?

.....
.....

16) What do you think about bird trade change?

.....
.....

17) Which seasonal do they sell bird the most?

.....
.....

18) Which seasonal do they sell bird the less?

.....
.....

19) What is the main reasons that customer buys the bird?

- Pet
- Traditional Medicine
- Beauty
- Status symbol
- Song bird
- Rare species
- Consumption

- Other

20) Do you ever hunt bird before?

.....
.....

21) Why do you interested in bird hunting?

- Pet
- Consumption
- Traditional Medicine
- Beauty
- Song bird
- Rare species
- Others
- Don't know

22) If you hunt birds for food, do you ever give on sale?

.....
.....

23) How many hours do you use for hunt bird?

.....
.....

24) What bird species do you ever see and hunt during the year?

.....
.....

25) Do you think that the species of bird are affected to hunt? Why?

.....
.....

26) Which bird species that doesn't hunt?

.....
.....

27) Which plants species are important to find birds?

.....
.....

28) If you have a chance to protect bird, what are you going to do?

.....
.....

29) Does bird trade illegal? Why?

.....
.....

30) Do you think that we should protect bird? Why?

.....
.....

31) Please give me the way how to conservation bird?

.....
.....

32) Do the forestry staffs used to check the bird trade before?

- Used to Never

33) How frequently do they come to check?

.....

.....

34) Do they hold the bird on trade?

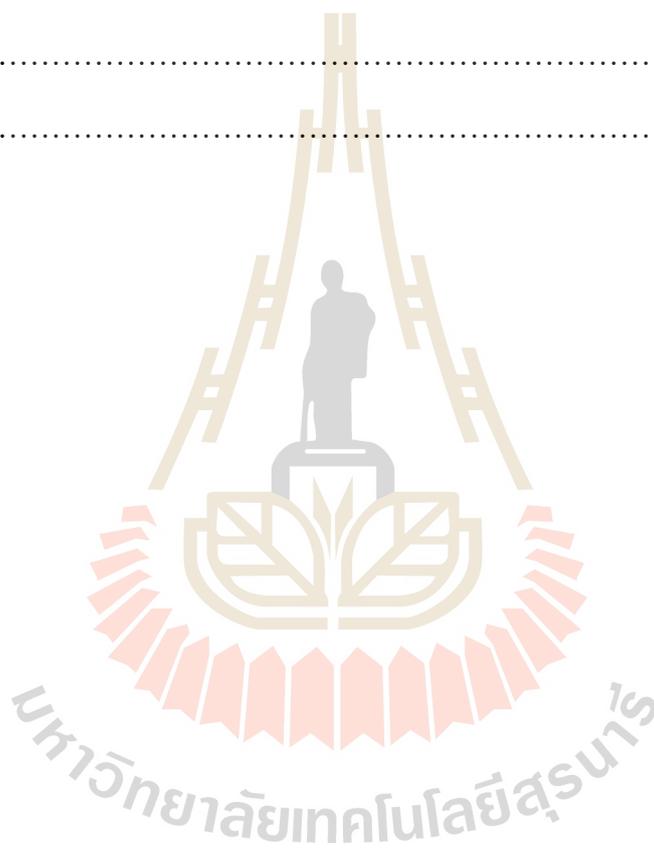
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35) Do they give any suggestions?

.....

.....



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