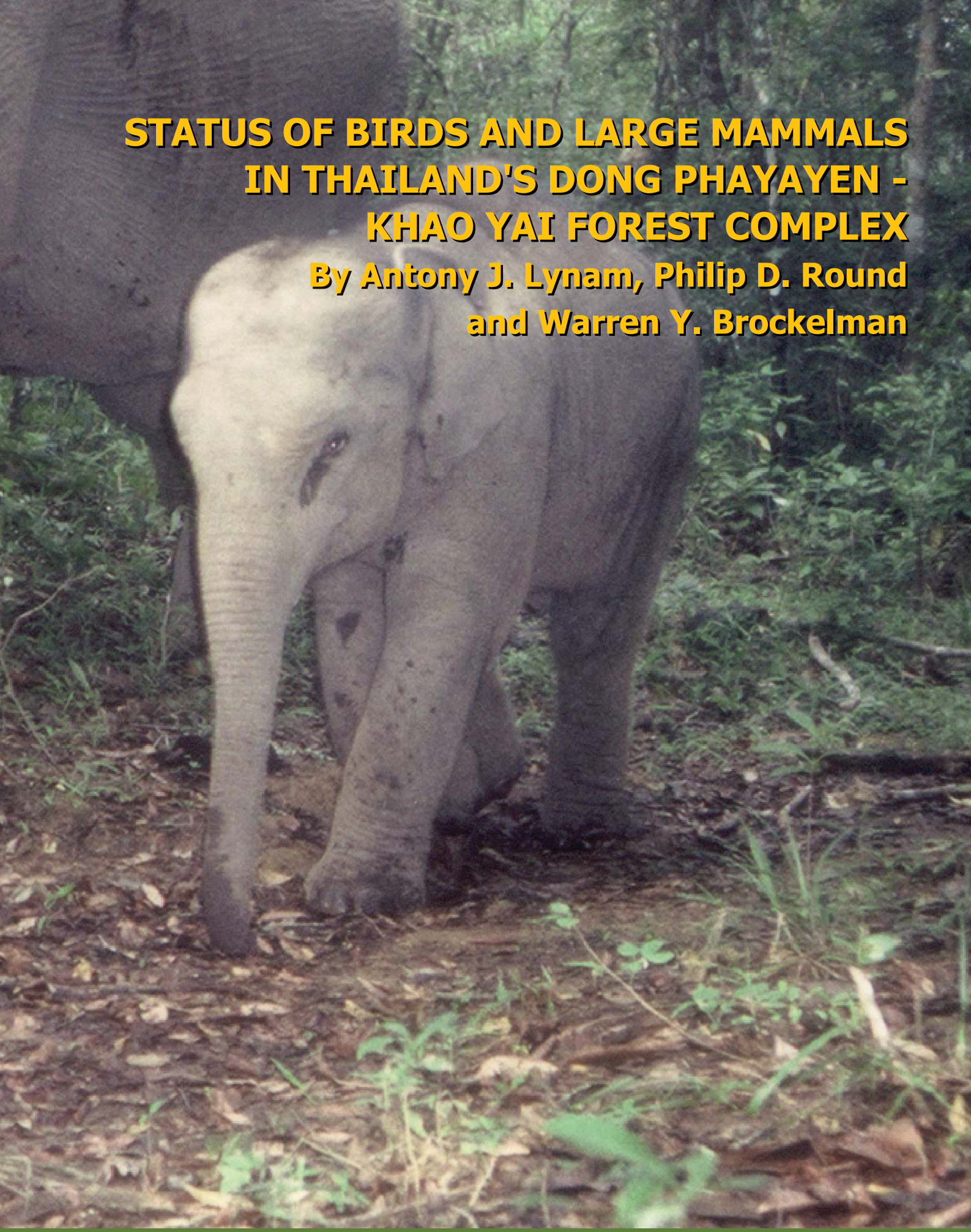

STATUS OF BIRDS AND LARGE MAMMALS IN THAILAND'S DONG PHAYAYEN - KHAO YAI FOREST COMPLEX

By Antony J. Lynam, Philip D. Round and Warren Y. Brockelman

WILDLIFE CONSERVATION SOCIETY
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2006

WCS BACKGROUND

The history of the Wildlife Conservation Society in Thailand dates to the mid 1970's when WCS supported behavioural studies of gibbons by Dr Warren Brockelman and his associates. Dr Alan Rabinowitz pioneered studies of carnivore ecology at Huai Kha Khaeng Wildlife Sanctuary during the late 1980's and early 90's and helped shape the first regional transboundary conservation forum. At the invitation of the government of Thailand, Dr Antony Lynam opened a project office for the Wildlife Conservation Society in 1997 to support a wildlife management training program, initiate an Indochina tiger conservation program, and support conservation research of government staff. In 2002, WCS and the Thailand government agreed to a comprehensive Memorandum of Understanding to expand their working relationship and extend its term and to help make wildlife conservation sustainable and more effective in Thailand. The programme has provided wildlife training and jobs for over 500 government staff, students, local people and conservationists. The WCS Thailand Programme is now directed by Dr Anak Pattanavibool.

AUTHOR BIOGRAPHIES

ANTONY J. LYNAM PH.D

Antony Lynam joined the Wildlife Conservation Society in 1996 as Associate Conservation Scientist and is based in Bangkok, Thailand where he conducts wildlife field research and conservation training programs with the governments of Myanmar, Cambodia, and other countries in Southeast Asia. An Australian Citizen, he has authored a number of technical papers and popular articles concerning conservation issues in Australia, North America and Thailand, and was a contributor to the seminal volume on habitat fragmentation *Tropical Forest Remnants: Ecology, Conservation and Management*. He was commissioned to write a National Tiger Action Plan for Myanmar. Working with WCS Lynam has trained over 500 government staff of Thailand Myanmar, Cambodia, Lao PDR, Indonesia and Malaysia in wildlife ecology, survey and conservation techniques. His most recent research interests concern tiger and large mammal conservation and ecology.

PHILIP D. ROUND

Philip Round is a British citizen based at the Department of Biology, Mahidol University, Bangkok, where he teaches and conducts field research on birds. He has authored over 80 technical papers and popular articles on bird ecology, taxonomy, distribution and conservation status in both national and international journals. He was also the author of *The Guide to the Birds of Thailand* with the late Dr. Boonsong Lekagul. He has a particular interest in the avifauna of Khao Yai having first studied birds there over 25 years ago, and has also conducted wildlife surveys in Lao PDR (for WCS) and in Vietnam. His current research is on the ecology and population dynamics of birds on the long-term forest dynamics plot at Mo Singto, Khao Yai.

WARREN Y. BROCKELMAN PH.D

Warren Brockelman has worked in Thailand since 1973 when he started teaching biology at Mahidol University. Trained as an ecologist, he soon became interested in studying the ecology and behaviour of wild gibbon populations in Khao Yai National Park where two species occur in contact. He has helped to initiate numerous conservation projects over the years. One of his special interests is the development of survey and census methods for gibbons and their habitat. He has recently established a long-term forest dynamics plot in Khao Yai Park for the study of plant population dynamics and plant-animal interactions, especially seed dispersal mechanisms, with emphasis on gibbons and birds.

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บทสรุปสำหรับผู้บริหารและข้อเสนอแนะเพื่อการอนุรักษ์

1. ไทยจัดเป็นหนึ่งในประเทศที่มีระบบพื้นที่อนุรักษ์ก้าวหน้าที่สุดในภูมิภาคเอเชียตะวันออกเฉียงใต้ครอบคลุมพื้นที่ถึงราวร้อยละ 17 ของพื้นที่ประเทศ ในอดีตการจัดการพื้นที่อนุรักษ์มุ่งให้สำคัญกับพื้นที่แยกเป็นแห่งๆ ไปแต่ปัจจุบันหันมาให้ความสำคัญกับการจัดการกลุ่มป่าแทน
2. มีการกำหนดกลุ่มป่าเพื่อการอนุรักษ์และจัดการขึ้นรวมสิบเจ็ดกลุ่มป่า ครอบคลุมพื้นที่ 91,195 ตร.กม. กลุ่มป่าดงพญาเย็น-เขาใหญ่ (DPKY) มีพื้นที่ 6,199 ตร.กม. ประกอบด้วยอุทยานแห่งชาติสี่แห่งกับเขตรักษาพันธุ์สัตว์ป่าหนึ่งแห่ง
3. สมาคมอนุรักษ์สัตว์ป่าร่วมกับกรมป่าไม้ (ปัจจุบันคือกรมอุทยานแห่งชาติ สัตว์ป่า และพันธุ์พืช) ทำการสำรวจภาคสนามเพื่อประเมินสถานภาพและการกระจายของนกและสัตว์เลี้ยงลูกด้วยนมขนาดใหญ่ โดยมุ่งศึกษาสัตว์ที่มีสถานภาพถูกคุกคามทั้งในระดับโลกและระดับประเทศ
4. การสำรวจนี้มีวัตถุประสงค์เพื่อจัดทำรายชื่อนกและสัตว์เลี้ยงลูกด้วยนมขนาดใหญ่ซึ่งถูกต้องแม่นยำ ให้ข้อมูลเกี่ยวกับภัยคุกคามสัตว์ป่าเพื่อให้ผู้จัดการพื้นที่สามารถใช้ในการวางแผนเพื่อการจัดการได้ รวมทั้งให้การฝึกอบรมวิธีการสำรวจแก่เจ้าหน้าที่ด้วย
5. มีการสำรวจในพื้นที่อนุรักษ์สามแห่งคืออุทยานแห่งชาติเขาใหญ่ ทับลาน และตาพระยา การสำรวจนกใช้วิธีสังเกตโดยตรง ขณะที่สัตว์เลี้ยงลูกด้วยนมขนาดใหญ่สำรวจโดยใช้วิธีสังเกตร่องรอย ใช้กล้องดักถ่ายภาพ สังเกตโดยตรง และสัมภาษณ์ชาวบ้านในพื้นที่
6. ข้อมูลเพิ่มเติมรวบรวมขึ้นจากฐานข้อมูล MASS ของมหาวิทยาลัยมหิดล เอกสารวิชาการและรายงานการสำรวจที่ทำในอุทยานแห่งชาติปางสีดาและพื้นที่สงวนชีวมณฑลสะแกราช สำหรับพื้นที่อนุรักษ์แห่งที่หกในกลุ่มป่าคือเขตรักษาพันธุ์สัตว์ป่าดงใหญ่นั้นไม่สามารถทำการสำรวจได้

ผลการสำรวจ

นก

7. พบนกรวม 391 ชนิดในกลุ่มป่าดงพญาเย็น-เขาใหญ่ โดย 49 ชนิดเป็นนกที่มีความสำคัญทางการอนุรักษ์ในระดับโลกหรือระดับประเทศ
8. ป่ากึ่งป่าดิบในกลุ่มป่าดงพญาเย็น-เขาใหญ่จัดว่ามีความเชื่อมโยงต่อเนื่องกันอยู่บ้าง จึงเชื่อว่ามีความสำคัญอย่างยิ่งต่อการอยู่รอดของนกหลายชนิดในประเทศ ประกอบด้วย ไก่ฟ้าพญาลอ Siamese Fireback *Lophura diardi*, นกหัวขวานใหญ่สีเทา Great Slaty Woodpecker *Mulleripicus pulverulentus*, นกเงือก (Bucerotidae) รวม 4 ชนิด, นกโกโรโกโส Coral-billed Ground Cuckoo *Carpococcyx renauldi*, นกปากกบพันธุ์ชวา Javan Frogmouth *Batrachostomus javensis*, นกเปล้าหน้าเหลือง Pompadour Pigeon *Treron pompadora*, นกลุมพู Green Imperial Pigeon *Ducula aenea*, นกอินทรีดำ Black Eagle *Ictinaetus malayensis*, เหยี่ยวภูเขา Mountain Hawk Eagle *Spizaetus nipalensis*, นกยางลายเสือ Malayan Night Heron *Gorsachius melanolophus*, นกขมิ้นขาว Silver Oriole *Oriolus mellianus*, นกเอี้ยงหัวสีทอง Golden-crested Myna *Ampeliceps coronatus* และนกขุนทอง Hill Myna *Gracula religiosa*
9. มีนกที่อยู่ในสถานภาพใกล้ถูกคุกคามทั้งในประเทศและระดับโลกจำนวนหนึ่งอาศัยอยู่บริเวณชายขอบกลุ่มป่าดงพญาเย็น-เขาใหญ่บริเวณป่าเต็งรังในพื้นที่ต่ำและป่าผลัดใบ โดยเฉพาะบริเวณใกล้แนวเขตทิศเหนือของอุทยานแห่งชาติทับลาน พื้นที่สงวนชีวมณฑลสะแกราช และพื้นที่ชายขอบอุทยานแห่งชาติตาพระยา ประชากรนกที่อาศัยอยู่ภายในกลุ่มป่าดงพญาเย็น-เขาใหญ่โดยรวมมีจำนวนไม่มาก แต่พื้นที่ป่าผลัดใบในที่ราบของประเทศไทยปัจจุบันหลงเหลืออยู่น้อยเต็มทีพื้นที่เหล่านี้จึงมีความสำคัญสูงมาก โดยนกชนิดสำคัญที่พบใน

ถิ่นที่อาศัยลักษณะนี้ได้แก่นกยูง Green Peafowl *Pavo muticus*, นกหัวขวานเขียวท้องลาย Streak-throated Woodpecker *Picus xanthopygaeus*, นกแก้วหัวแพร Blossom-headed Parakeet *Psittacula roseata*, เหยี่ยวปีกแดง Rufous-winged Buzzard *Butastur liventer*, เหยี่ยวเล็กตะโพกขาว White-rumped Falcon *Polihierax insignis*, และนกอีแพรดคิ้วขาว White-browed Fantail *Rhipidura aureola*

10. นอกจากนั้นยังมีรายงานของนกอีกสามชนิดที่อยู่ในสถานภาพถูกคุกคามทั้งในประเทศหรือระดับโลก ได้แก่ เป็ดก่า White-winged Duck *Cairina scutulata*, เป็ดหงส์ Comb Duck *Sarkidiornis melanotis*, และนกกระสาคอขาว Woolly-necked Stork *Ciconia episcopus*รายงานเหล่านี้แม้จะไม่มีการยืนยันอย่างเป็นทางการก็ยังสมควรจะตรวจสอบความถูกต้องต่อไป

สัตว์เลี้ยงลูกด้วยนม

11. พบสัตว์เลี้ยงลูกด้วยนมขนาดใหญ่รวม 60 ชนิดในกลุ่มป่าดงพญาเย็น-เขาใหญ่ 24 ชนิดเป็นสัตว์ที่มีความสำคัญทางการอนุรักษ์ในระดับโลกหรือระดับประเทศ
12. สัตว์เลี้ยงลูกด้วยนมชนิดสำคัญที่อาศัยพื้นที่ป่ากึ่งป่าดิบอันเป็นชนิดป่าหลักของกลุ่มป่าดงพญาเย็น-เขาใหญ่ ได้แก่ชะนีมือขาว White-handed Gibbon *Hylobates lar*, ชะนีมงกุฎ Pileated Gibbon *Hylobates pileatus*, ช้าง Asian Elephant *Elephas maximus*, กะทิง Gaur *Bos gaurus*, เสือโคร่ง Tiger Panthera *tigris corbetti*, เสือลายเมฆ Clouded Leopard *Neofelis nebulosa*, เสือไฟ Asian Golden Cat *Catopuma temminckii*, แมวลายหินอ่อน Marbled Cat *Pardofelis marmorata* และเลียงผา Southern Serow *Capricornis sumatraensis*
13. สัตว์ที่มีสถานภาพถูกคุกคามในระดับโลกอีกชนิดคือวัวแดง Banteng *Bos javanicus* พบอาศัยบริเวณป่าเต็งรังในพื้นที่ต่ำและป่าผลัดใบชายขอบกลุ่มป่าดงพญาเย็น-เขาใหญ่โดยเฉพาะบริเวณใกล้แนวเขตทิศเหนือของอุทยานแห่งชาติทับลาน พื้นที่สงวนชีวมณฑลสะแกราช และพื้นที่ชายขอบอุทยานแห่งชาติตาพระยา ประชากรวัวแดงที่พบเป็นประชากรขนาดเล็ก กระจายอยู่ในกลุ่มป่าดงพญาเย็น-เขาใหญ่ แต่เนื่องจากพื้นที่ป่าผลัดใบในที่ราบของประเทศไทยปัจจุบันหลงเหลืออยู่น้อยมาก ประชากรวัวแดงเหล่านี้จึงมีความสำคัญสูงมาก

ภัยคุกคาม

14. พื้นที่กลุ่มป่าดงพญาเย็น-เขาใหญ่ถูกบุกรุกโดยเจตนาเพื่อลักลอบเก็บผลิตภัณฑ์ที่ไม่ใช่ไม้ (non-timber forest products - NTFPs) อย่างกว้างขวาง ในระยะหลังการเก็บไม้หอมเพิ่มความรุนแรงขึ้นแม้จะมีการป้องกันและปราบปรามอย่างหนัก ทั้งนี้เพราะมูลค่าของน้ำมันกฤษณาและไม้หอมในตลาดพุ่งสูงขึ้น กลุ่มผู้บุกรุกนี้ล่าสัตว์เพื่อยังชีพในป่า รวมทั้งรบกวนถิ่นที่อาศัยของสัตว์ป่า จึงเป็นภัยคุกคามสำคัญสำหรับประชากรสัตว์เลี้ยงลูกด้วยนมขนาดใหญ่และนก การเก็บไม้หอมเป็นกิจกรรมที่ชาวบ้านในพื้นที่ปฏิบัติมาตั้งแต่ในอดีต แม้จะมีกฎหมายห้ามแต่อุตสาหกรรมไม้หอมก็ยังเติบโตขยายตัวขึ้นเนื่องจากเปิดช่องว่างให้โรงงานขนาดเล็กในท้องถิ่นทำการแปรรูปไม้หอมเป็นน้ำมันได้
15. มีการจับนกเงือก ไก่ฟ้า นกเค้า เหยี่ยว นกเอี้ยง นกขุนทอง และนกอื่นๆ ที่มีเสียงร้องไพเราะเพื่อขายเป็นสัตว์เลี้ยง โดยจัดส่งไปขายในตลาดในเขตเมือง โดยเฉพาะตลาดนัดสวนจตุจักร
16. มีการล่าสัตว์เลี้ยงลูกด้วยนมขนาดใหญ่เช่นกระทิง หรือแม้แต่ช้าง เพื่อขายเขาหรืองา รวมทั้งมีการจับเสือขนาดเล็กเช่นเสือลายเมฆและแมวลายหินอ่อนเพื่อขายเป็นๆ ด้วย
17. พื้นที่อนุรักษ์ในกลุ่มป่าดงพญาเย็น-เขาใหญ่หลายแห่งถูกล้อมกรอบด้วยพื้นที่ในครอบครองของมนุษย์ทั้งนาข้าวและพื้นที่อยู่อาศัย อุทยานแห่งชาติเขาใหญ่ถูกตัดขาดจากพื้นที่อนุรักษ์อื่นอย่างสิ้นเชิงทั้งโดยถนนและพื้นที่อาศัยของมนุษย์

18. การบุกรุกป่าทำให้ถิ่นที่อาศัยของสัตว์ป่าเสียหายหรือเปลี่ยนสภาพไป ยังเป็นปัญหาหลักที่พบทั่วพื้นที่กลุ่มป่าดงพญาเย็น-เขาใหญ่ โดยพื้นที่ที่ประสพปัญหารุนแรงที่สุดได้แก่บริเวณตะวันออกเฉียงใต้ของเขาใหญ่ ทับลาน และตาพระยา
19. การเลี้ยงสัตว์โดยปล่อยให้หากินในพื้นที่อนุรักษ์และไฟทำให้ถิ่นที่อาศัยของสัตว์ป่าเสียหาย โครงสร้างและองค์ประกอบของป่าเปลี่ยนไปและทำให้ผู้บุกรุกสามารถเข้าถึงพื้นที่ส่วนต่าง ๆของพื้นที่อนุรักษ์ในกลุ่มป่าดงพญาเย็น-เขาใหญ่ได้ง่ายขึ้น
20. ทางหลวงสายหลักและถนนสาธารณะที่ตัดผ่านพื้นที่อนุรักษ์ในกลุ่มป่าดงพญาเย็น-เขาใหญ่ ทำให้ถิ่นที่อาศัยของสัตว์ป่าในพื้นที่อนุรักษ์ถูกตัดแยกจากกัน ทำให้ผู้บุกรุก ผู้ลักลอบทำไม้ และผู้ลักลอบเก็บผลิตภัณฑ์ที่ไม่ใช่ไม้เข้าถึงพื้นที่ได้ง่ายขึ้น สัตว์เลี้ยงลูกด้วยนมขนาดใหญ่ที่หากินบนพื้นอาจเสี่ยงต่อการถูกรถชนขณะเดินข้ามทางหลวงสายหลักที่ตัดผ่านระหว่างเขาใหญ่และทับลาน ด้วยเหตุนี้สัตว์ป่าขนาดใหญ่จึงอาจหลีกเลี่ยงไม่เดินทางข้ามไปมาระหว่างพื้นที่ด้วยทางเชื่อมนี้
21. ที่เขาใหญ่ยังมีภัยคุกคามจากการจัดการการท่องเที่ยวซึ่งไม่มีประสิทธิภาพเพียงพอ ส่วนทับลาน ปางสีดา และตาพระยามีระดับของภัยคุกคามด้านนี้ต่ำกว่า ผลกระทบด้านลบจากการท่องเที่ยวประกอบด้วยระดับการสัญจรซึ่งยิ่งสูงยิ่งทำให้มีสัตว์ตายด้วยอุบัติเหตุบนถนนมาก และการก่อสร้างสิ่งอำนวยความสะดวกต่าง ๆ สำหรับนักท่องเที่ยวในพื้นที่ซึ่งมีความอ่อนไหว เป็นการก่อความรบกวนต่อนกและสัตว์เลี้ยงลูกด้วยนม ปัจจุบันยังไม่มีการศึกษาถึงผลกระทบจากการท่องเที่ยวที่มีต่อสัตว์ป่าและถิ่นที่อาศัยของสัตว์ที่มีความอ่อนไหวแต่ประเมินได้ว่าน่าจะมีผลกระทบในระดับหนึ่ง
22. กำลังเจ้าหน้าที่เพื่อการจัดการสัตว์ป่าและถิ่นที่อาศัยของสัตว์ป่าในพื้นที่อนุรักษ์กลุ่มป่าดงพญาเย็น-เขาใหญ่มีมากพอสมควรอยู่แล้ว อุทยานฯ มีทั้งลูกจ้างประจำและลูกจ้างชั่วคราวสำหรับปฏิบัติหน้าที่ป้องกันปราบปรามและติดตามสำรวจสัตว์ป่า แต่เจ้าหน้าที่เหล่านี้ยังขาดการฝึกอบรมอย่างเป็นทางการ นอกจากนั้นในกลุ่มป่าดงพญาเย็น-เขาใหญ่ยังมีเพียงอุทยานแห่งชาติเขาใหญ่แห่งเดียวเท่านั้นที่มีการติดตามสำรวจสัตว์ป่าและถิ่นอาศัยของสัตว์อย่างเป็นระบบ

ข้อเสนอแนะเพื่อการอนุรักษ์

มาตรการระยะสั้น (1-2 ปี)

23. จัดการประชุมปฏิบัติการด้านการวิจัยและอนุรักษ์ให้นักวิจัยและหัวหน้าพื้นที่อนุรักษ์ สอบทานความรู้เกี่ยวกับสัตว์ชนิดสำคัญจากโครงการศึกษาวิจัยระยะยาวในพื้นที่อนุรักษ์กลุ่มป่าดงพญาเย็น-เขาใหญ่ และนำความรู้นี้มาประกอบในการทำแผนการจัดการพื้นที่
24. ฝึกอบรมเจ้าหน้าที่พื้นที่อนุรักษ์ในกลุ่มป่าดงพญาเย็น-เขาใหญ่เกี่ยวกับเทคนิคการติดตามสำรวจสัตว์ป่า จัดตั้งทีมติดตามสำรวจ และดำเนินการโครงการติดตามสำรวจสัตว์ป่าชนิดพันธุ์ที่ถูกคุกคาม
25. จัดทำฐานข้อมูลกลางที่รวบรวมข้อมูลด้านการกระจาย ความชุกชุม และแนวโน้มต่าง ๆ ของสัตว์ป่าชนิดสำคัญทั่วพื้นที่กลุ่มป่าดงพญาเย็น-เขาใหญ่ ฝึกอบรมเจ้าหน้าที่พื้นที่อนุรักษ์ให้สามารถใช้ฐานข้อมูลสนับสนุนให้นักวิจัยและทีมติดตามสำรวจสัตว์ป่าป้อนข้อมูลที่รวบรวมได้เข้าไปในฐานข้อมูล รวมทั้งมีการติดตามตรวจสอบคุณภาพของข้อมูลที่ป้อนเข้าไปด้วย
26. จัดทำแนวเขตพื้นที่อนุรักษ์ในกลุ่มป่าดงพญาเย็น-เขาใหญ่โดยใช้อุปกรณ์ช่วยบอกพิกัดและสารสนเทศภูมิศาสตร์ (Geographic Information System - GIS) เพื่อแก้ไขปัญหาการบุกรุกพื้นที่ป่า โดยให้เจ้าหน้าที่กรมอุทยานแห่งชาติ สัตว์ป่า และพันธุ์พืชร่วมทำแนวเขตกับเจ้าหน้าที่ท้องถิ่นและชาวบ้านเพื่อส่งเสริมให้เกิดความร่วมมือตลอดจนความเข้าใจอันดีระหว่างกัน

27. ดำเนินการจัดแบ่งเขตพื้นที่เพื่อการจัดการโดยกำหนดไว้ในแผนการจัดการ บังคับใช้กฎระเบียบอย่างเคร่งครัดในพื้นที่หวงห้ามเพื่อการอนุรักษ์ซึ่งไม่อนุญาตให้บุคคลภายนอกรุกล้ำเข้าไป การจัดแบ่งเขตพื้นที่ควรพิจารณาถึงพื้นที่การกระจายและความต้องการทางนิเวศวิทยาของนกและสัตว์เลี้ยงลูกด้วยนมขนาดใหญ่ชนิดที่มีความสำคัญ
28. จัดทำแผนการจัดการที่ยึดความร่วมมือในระดับกลุ่มป่าเป็นหลักแทนแผนจัดการเฉพาะพื้นที่ โดยแผนดังกล่าวควรประกอบด้วยการประสานงานเพื่อลาดตระเวนการฝึกซ้อมจัดทำแนวเขตพื้นที่อนุรักษ์ฝึกซ้อมการศึกษาวิจัยร่วมและฝึกซ้อมการควบคุมไฟป่า โดยสนธิกำลังเจ้าหน้าที่จากพื้นที่อนุรักษ์ที่มีแนวเขตติดต่อกัน
29. ฝึกอบรมเจ้าหน้าที่พิทักษ์ป่าในพื้นที่อนุรักษ์ทุกแห่งในกลุ่มป่าดงพญาเย็น-เขาใหญ่ให้รู้จักเทคนิคการลาดตระเวนและการปราบปรามผู้ลักลอบล่าสัตว์ โดยใช้วิธีการที่เป็นมาตรฐาน จัดการฝึกอบรมร่วมสำหรับเจ้าหน้าที่จากพื้นที่อนุรักษ์ทุกแห่งปีละหนึ่งครั้งเพื่อส่งเสริมให้เกิดความร่วมมือในหมู่เจ้าหน้าที่ภาคสนาม
30. ดำเนินการลาดตระเวนอย่างเป็นระบบด้วยการประสานงานและความร่วมมือระหว่างเจ้าหน้าที่ในพื้นที่อนุรักษ์ที่มีแนวเขตติดต่อกัน รวมทั้งจัดให้มีระบบการรายงานการกระทำความผิดเกี่ยวกับสัตว์ป่าและป่าไม้ด้วย
31. ดำเนินการสำรวจภาคสนามเพิ่มเติมในพื้นที่ทับลาน/ปางสีดาเพื่อศึกษาการกระจายพันธุ์ของสัตว์ป่าในถิ่นที่อาศัยที่หายากคือป่าเต็งรัง

มาตรการระยะปานกลาง (3-10 ปี)

32. ทำการศึกษาวิจัยเพื่อศึกษาปัจจัยต่าง ๆ ทางนิเวศวิทยาที่มีความจำเป็น ตลอดจนศึกษาความอ่อนไหวของนกและสัตว์เลี้ยงลูกด้วยนมขนาดใหญ่ชนิดสำคัญ
33. ระดมเจ้าหน้าที่เพื่อร่วมทีมวิจัยและติดตามสำรวจสัตว์ป่าเพื่อปฏิบัติหน้าที่ทั่วพื้นที่กลุ่มป่าดงพญาเย็น-เขาใหญ่
34. ทำการประเมินที่ตั้งและการทำงานของหน่วยพิทักษ์พื้นที่อนุรักษ์ใหม่เพื่อให้เกิดประสิทธิภาพสูงสุดในการปราบปรามการลักลอบล่าสัตว์และการบุกรุกพื้นที่
35. ปรับปรุงการประสานงานระหว่างหน่วยพิทักษ์พื้นที่อนุรักษ์ต่าง ๆ กับเจ้าหน้าที่ลาดตระเวนทั้งภายในพื้นที่อนุรักษ์เดียวกันและต่างพื้นที่ในกลุ่มป่าดงพญาเย็น-เขาใหญ่
36. ปรับปรุงการประสานงานระหว่างเจ้าหน้าที่ภาคสนามของกรมฯ กับเจ้าหน้าที่ตำรวจ โดยสนับสนุนให้มีการการสนธิกำลังจากหน่วยงานหลายฝ่ายในกิจกรรมป้องกันและปราบปรามการกระทำผิดเกี่ยวกับสัตว์ป่า
37. ดำเนินการวิจัยและรวบรวมข้อเท็จจริงเพื่อศึกษารูปแบบการล่าสัตว์ป่าชนิดสำคัญศึกษาเส้นทางที่ใช้ลักลอบค้าตลาดและความเคลื่อนไหวในการค้าสัตว์ป่า
38. ใช้ข้อมูลดังกล่าวเพื่อปราบปรามการลักลอบค้าสัตว์ป่าจากพื้นที่อนุรักษ์ในกลุ่มป่าดงพญาเย็น-เขาใหญ่
39. จัดการฝึกอบรมอย่างเป็นทางการเกี่ยวกับเทคนิคการบังคับใช้กฎหมายและชุมชนสัมพันธ์ให้เจ้าหน้าที่ภาคสนามของพื้นที่อนุรักษ์ทุกแห่ง
40. เริ่มดำเนินโครงการคุ้มครองสัตว์ป่าในพื้นที่อนุรักษ์ทุกแห่งในกลุ่มป่าดงพญาเย็น-เขาใหญ่ โดยความร่วมมือและความสนับสนุนด้านเทคนิคจากหน่วยงานภายนอก และใช้งบประมาณประจำปีของกรมอุทยานแห่งชาติ สัตว์ป่าและพันธุ์พืช

EXECUTIVE SUMMARY AND CONSERVATION RECOMMENDATIONS

1. Thailand has one of the most extensive systems of protected areas in Mainland Southeast Asia with c. 17% of land area coverage. In the past, protected area management focused on individual reserves. Increasingly, management now emphasizes forest complexes.
2. Seventeen terrestrial protected forest complexes covering 91,195 km^2 have been defined for future conservation and management in Thailand. The Dong Phayayen - Khao Yai (DPKY) forest complex incorporates four National Parks and one Wildlife Sanctuary, covering 6,199 km^2.
3. In cooperation with the Royal Forest Department (now Department of National Parks, Wildlife and Plant Conservation or DoNP), the Wildlife Conservation Society conducted field surveys to assess the status and distribution of birds and large mammals, with an emphasis on Globally and Nationally Threatened Key Species.
4. Objectives of the surveys were to generate reliable baseline inventories of birds and large mammals and provide information to managers on threats to wildlife for use in management planning, and to provide training in survey methods for government staff.
5. Surveys focused on three reserves; Khao Yai, Thap Lan, and Ta Phraya National Parks. Birds were surveyed via direct observations, while large mammals were surveyed using track and sign searches, camera-traps, direct observation, and interviews with local people.
6. Additional information was gleaned from the Mahidol University MASS database, publications and previous survey reports for Pang Sida National Park and Sakaerat Biosphere Reserve. A sixth reserve which is part of the complex, Dong Yai Wildlife Sanctuary, was unavailable for survey.

RESULTS OF SURVEYS

Birds

7. A total of 391 species of birds are known from the DPKY forest complex. This includes 49 species of known or likely global or national conservation concern.
8. Among those birds for which the large block of more or less contiguous semi-evergreen forest in DPKY is thought to be especially significant in a national context are: Siamese Fireback *Lophura diardi*, Great Slaty Woodpecker *Mulleripicus pulverulentus*, four species of hornbills (Bucerotidae), Coral-billed Ground Cuckoo *Carpococcyx renauldi*, Javan Frogmouth *Batrachostomus javensis*, Pompadour Pigeon *Treron pompadora*, Green Imperial Pigeon *Ducula aenea*, Black Eagle *Ictinaetus malayensis*, Mountain Hawk Eagle *Spizaetus nipalensis*, Malayan Night Heron *Gorsachius melanolophus*, Silver Oriole *Oriolus mellianus*, Golden-crested Myna *Ampeliceps coronatus* and Hill Myna *Gracula religiosa*.
9. A number of nationally or globally near-threatened species were found to occur in association with lowland dry dipterocarp and other deciduous habitats around the margin of DPKY, especially near the northern border of Thap Lan National Park, in Sakaerat Biosphere Reserve, and around the margins of Ta Phraya National Park. Overall populations within DPKY are likely to be small, but because of the extremely limited areas of plains-level deciduous woodland remaining nationwide, nonetheless

highly significant. Key Species of birds associated with this habitat are: Green Peafowl *Pavo muticus*, Streak-throated Woodpecker *Picus xanthopygaeus*, Blossom-headed Parakeet *Psittacula roseata*, Rufous-winged Buzzard *Butastur liventer*, White-rumped Falcon *Polihierax insignis*, and White-browed Fantail *Rhipidura aureola*.

10. The occurrence of a further three globally or nationally threatened species has been reported for DPKY. These are White-winged Duck *Cairina scutulata*, Comb Duck *Sarkidiornis melanotis*, Woolly-necked Stork *Ciconia episcopus*. These records are provisional and unconfirmed but deserve further investigation.

Mammals

11. A total of 60 species of large mammals are known from DPKY. This includes 24 species of known or likely global or national conservation concern.
12. Key Species of mammals associated with the semi-evergreen forest block that is the dominant habitat type in the DPKY are White-handed Gibbon *Hylobates lar*, Pileated Gibbon *Hylobates pileatus*, Asian Elephant *Elephas maximus*, Gaur *Bos gaurus*, Tiger *Panthera tigris corbetti*, Clouded Leopard *Neofelis nebulosa*, Asian Golden Cat *Catopuma temminckii*, Marbled Cat *Pardofelis marmorata* and Southern Serow *Capricornis sumatraensis*.
13. Another Globally Threatened species, Banteng *Bos javanicus*, was found to occur in association with lowland dry dipterocarp and other deciduous habitats around the margin of DPKY, especially near the northern border of Thap Lan National Park, in Sakaerat Biosphere Reserve, and around the margins of Ta Phraya National Park. Banteng exists in scattered small populations within DPKY but because of the extremely limited areas of plains-level deciduous woodland remaining nationwide, these populations are highly significant.

Threats

14. Organized collection of non-timber forest products (NTFPs) including aloewood (*Aquilaria* spp.), bamboo and rattan is widespread in DPKY reserves. Aloewood collecting is a traditional activity of local residents. Although illegal, the industry thrives due to legal loopholes that permit local factories to produce fragrant oils. Aloewood poaching has intensified in recent years despite increased protection efforts, due to increasing market prices for fragrant oils and wood. Subsistence poaching practiced by NTFP collectors along with habitat disturbance is a key threat to large mammal and birds populations.
15. Live capture of hornbills, pheasants, owls, raptors, and mynas and other songbirds, is done for the pet trade. Birds reach markets in urban centres, especially the Bangkok Weekend Market.
16. Poaching of large mammals including Gaur, and possibly Asian elephant, is done for trophies. Wild cats including Clouded Leopard, and Marbled Cat are subject to capture for live-trade.
17. DPKY reserves are surrounded by lands converted for rice farming and human settlement. Khao Yai National Park is completely detached from other reserves by roads and human settlements.
18. Habitat loss and conversion caused by forest encroachers remains a major problem across DPKY but especially in SE Khao Yai, Thap Lan and Ta Phraya.
19. Livestock grazing and fire damage wildlife habitats, altering the structure and composition of forests, and facilitating access by poachers in parts of all DPKY reserves.

20. Major highways and public roads dissect DPKY reserves, and internally fragment wildlife habitats, facilitating access by poachers and illegal timber and NTFP collectors. Ground-frequenting large mammals risk collision with vehicles in crossing a major highway separating Khao Yai from Thap Lan. As a result the largest mammals probably do not use this potential corridor.
21. Inadequate management of tourism presents a threat for Khao Yai, and a lesser threat for Thap Lan, Pang Sida and Ta Phraya. Negative effects are two-fold; increased road traffic which increases the frequency of roadkills, and increased construction of tourist facilities in sensitive areas, which disturbs birds and mammals. The impacts of tourism on sensitive species and habitats have not been studied but are likely to be significant.
22. Relatively large numbers of staff are available for managing wildlife and habitats in DPKY reserves. Temporary and permanent hired labor are utilized for park protection and monitoring activities but these staff sometimes lack formalized training. Moreover, except for Khao Yai, DPKY reserves lack institutionalized monitoring systems for wildlife and habitats.

CONSERVATION RECOMMENDATIONS

Short-term actions (1–2 years)

23. Hold a research and conservation priorities workshop involving researchers and managers. Review knowledge about Key Species from long-term research programs in DPKY reserves, and incorporate this knowledge in reserve management plans.
24. Train DPKY reserve staff in wildlife monitoring techniques, establish local Monitoring Teams, and implement monitoring programs for threatened species.
25. Establish a centralized database to incorporate information on distribution, abundance and trends of Key Species across the DPKY forest complex. Train reserve staff to use the database. Encourage researchers and Monitoring Team staff to feed information into the database and to monitor the quality of data being input.
26. Demarcate DPKY reserve boundaries using navigation equipment and Geographic Information System (GIS) in order to address problems of forest encroachment. This should be done by teams of DoNP staff, local officials and residents to ensure cooperation and mutual understanding.
27. Implement management zoning specified by management plans, especially enforcement of Strict Conservation Zones where no human access is permitted. Zoning should consider the distributions and ecological requirements of key birds and large mammals.
28. Conduct cooperative management planning at the scale of the complex rather than individual reserves. This would include coordinated patrolling, reserve boundary demarcation exercises, collaborative research and fire control exercises by staff in neighbouring reserves.
29. Train rangers in patrol and anti-poaching techniques in all DPKY reserves, using standardized methods. Joint training exercises involving staff from all reserves should be done each year to facilitate cooperation between field staff.
30. Implement systematic patrolling with coordination and participation between staff of adjacent reserves, and establish reporting systems for wildlife and forestry crimes.
31. Implement additional field surveys in Thap Lan/Pang Sida to determine species distributions in rare habitats (*e.g.*, dry dipterocarp forest).

Medium-term actions (3–10 years)

32. Conduct research to determine the ecological requirements and sensitivities of Key Species of birds and large mammals.
33. Recruit staff to a Research and Monitoring Team that will conduct work across the DPKY forest complex.
34. Reassess the location and function of reserve substations to achieve maximum efficiency of anti-poaching and anti-encroachment activities.
35. Improve coordination between substations and ranger patrols within and among DPKY reserves.
36. Improve coordination between forestry and police field staff and encourage joint wildlife crime suppression activities involving multiple agencies.
37. Conduct research and investigations to determine patterns of hunting of Key Species, identify trade routes, markets and trade dynamics. Use this information to suppress illegal wildlife trade from DPKY reserves.
38. Conduct formalized training for all reserve field staff in enforcement techniques and community relations.
39. Initiate Wildlife Protection Programs in all DPKY reserves with technical assistance and cooperation from external agencies and financial support via DoNP annual budgets.

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CONVENTIONS

Key Species are defined as any species falling into one or more of the following global or regional threat categories (see following section for definitions of the various conventions used):

1. Any species considered to be Globally Threatened, Globally Near-Threatened or Data Deficient, following Hilton-Taylor (2000) for birds, and IUCN (2004) for mammals. For definitions of these conventions see below.
2. Any species considered At Risk in Lao PDR, Potentially At Risk in Lao PDR, and Little Known in Lao PDR, following Duckworth *et al.*, (1999).
3. Any species considered nationally or globally threatened or near-threatened, following Round (2000), itself based on Collar *et al.* (1994) for global threat categories, for birds, or for mammals, WARPA (1980) and OEPP (1996).

For a fully comprehensive discussion of the criteria by which each category is defined see Hilton-Taylor (2000) and IUCN (2004). Reference is also made to assessment of conservation status of birds and mammals in Lao PDR (Duckworth et al., 1999). Each Key Species account also notes if the species is included in either Appendices I, II, or III of CITES (CITES, 2000).

Square brackets [ ] denote species for which the presence is considered provisional, based on indirect signs or unauthenticated reports.

The listed observations are followed by a paragraph summarizing the status of each species in DPKY.

DEFINITIONS OF CONVENTIONS USED IN KEY SPECIES ACCOUNTS

The global threat categories relate to the threat to the survival of the species across its entire world range, following criteria defined formally (often quantitatively) in the 2000 IUCN Red List of Threatened Animals (Hilton-Taylor, 2000)

GLOBAL THREAT CATEGORIES

Globally Threatened - Critically Endangered (CR)
"A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future".

Globally Threatened - Endangered (EN)
"A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future".

Globally Threatened - Vulnerable (VU)
"A taxon is Vulnerable when it is not Critically Endangered or Endangered, but is facing a high risk of extinction in the wild in the medium term future".

Data deficient
A species for which there is inadequate information to make a direct, or indirect, assessment of its risk of global extinction in the wild. This category does not imply that the species is certainly Globally Threatened, and further data should show that the species is presently secure globally.

Globally Near-threatened (NT)
Near-threatened is one of three sub-categories of the Lower Risk (LR) category. Lower Risk is defined as "a taxon which, when evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable". Near-threatened is defined as "taxa which do not qualify for Conservation Dependent (the highest sub-category of Lower Risk), but which are close to qualifying for Vulnerable".

CITES TRADE CATEGORIES

These categories reflect the level of threat posed by international trade. Unlike global and national threat categories, CITES categories have a regulatory effect in trade between countries that are parties to the Convention on International Trade in Endangered Species of Wild Flora and Fauna. Thailand ratified the Agreement in 1983 and implemented domestic legislation (RFD, 1992) towards enabling the enforcement of international legislation.

I = Appendix I:
Species threatened with extinction that are or may be affected by trade. Trade in specimens between parties is only authorized in exceptional circumstance (such as import and export of specimens for scientific purposes).

II = Appendix II:
Species which although not necessarily now threatened with extinction may become so unless trade in specimens is subject to strict regulation in order to avoid over-utilization. Species may also be listed in Appendix II because of their similarity to more threatened species, as an aid to enforcement. Commercial trade in wild specimens listed on Appendix II is permitted between members of this convention, but is controlled and monitored through a licensing system.

III = Appendix III:
Species for which trade in wild specimens is permitted, but for which in certain CITES signatory countries requires appropriate regulation and documentation.

FURTHER CONVENTIONS

"Large mammals" is used as a broad term of convenience to refer to mammals that are generally identifiable in the field (following Dorst and Dandelot, 1970, in Duckworth and Hedges, 1998).

PART I. INTRODUCTION

1.1 BACKGROUND

In the 42 years since gazetting Khao Yai as its first National Park, Thailand has established an extensive network of protected areas comprising 102 National Parks and Marine National Parks, 68 Forest Parks, 53 Wildlife Sanctuaries, 49 Non-Hunting Areas, 15 Botanical Gardens and 54 Arboretums (Royal Forest Department, 2000). These areas make up 17.8% of the land area of the country (511,770 km^2).

A recent policy has been to target conservation attention on forest complexes that comprise multiple protected areas. Nineteen forest complexes exist for Thailand, ranging from 750–18,730 km^2, and averaging 5,000 km^2. The Dong Phayayen - Khao Yai (DPKY) is a 6,199 km^2 unit comprising the National Parks of Khao Yai, Thap Lan, Pang Sida and Ta Phraya, together with Dong Yai Wildlife Sanctuary (Prayurasiddhi *et al.*, 1999). One further area, Sakaerat Biosphere Reserve, is also more or less contiguous with the protected areas and is best treated as part of the same complex, even though managed by a different authority, Thailand Institute of Scientific and Technological Research (TISTR). These protected areas lie at the western end of the Phanom Dongrak escarpment, which partly delineates the Thai-Cambodian border.

Historically, these areas have received relatively little attention from biologists. Although Khao Yai is Thailand's oldest and best-known national park, almost all biological fieldwork hitherto conducted has been centred on a small area around the park headquarters, towards its NW margin. The biodiversity of other protected areas in the DPKY is even less well known. In recent years, Khao Yai's pre-eminence has been eclipsed by the parks and sanctuaries of the Western Forest Complex (WEFCOM), which form part of the largest contiguous forest area in the system. Owing to its location in drier and less topographically varied north-east Thailand, DPKY can be expected to be less species-rich than forest areas further west. The range of species it supports is likely to be different from that in other complexes. Also, DPKY represents a potentially important transboundary area linking wildlife populations of Thailand and Cambodia. Therefore, DPKY is important for wildlife conservation both nationally and regionally.

In order to establish conservation priorities for DPKY, accurate and complete information on the status and distribution of wildlife is required. This report details the findings of two parallel investigations of bird and large mammal diversity in DPKY. Because their habitat preferences and broad conservation status are rather well-known, birds are particularly useful as environmental indicators. Large mammals are generally sensitive to human disturbance because they require relatively large areas to support viable populations, come into conflict with humans at the edges of their habitats (Woodroffe and Ginsberg, 1998), and have high value in domestic and commercial markets (Duckworth and Hedges, 1998; Martin and Redford, 2000). Large mammals occupy ranges that include the smaller ranges of many other organisms, i.e., they are umbrella species. The presence of some large mammals, *e.g.*, top carnivores, is important for normal ecosystem functioning. Large mammals may therefore serve as useful focal species for protected area management .

A description of the bird and large mammal communities of the DPKY is therefore a good way to gauge the contribution of these few protected areas to the national network, and as a first step towards assessing the integrity of ecological processes.

1.2 OBJECTIVES

The objectives of this study were:

1. To compile a reliable baseline inventory of the birds and large mammals of the Dong Phayayen - Khao Yai Forest Complex (DPKY) as precursor for future, more detailed studies, and as an essential reference for conservation planners;
2. To improve on the technique of previous management plans that provided only cursory evidence of species status for these taxa because of limited survey effort, poor geographical coverage, and the lack of coverage of rare habitats;
3. To provide training in faunal inventory techniques to DoNP staff, and volunteers, and to encourage their participation in wildlife survey;
4. To provide general information on the intensity and nature of human use of DPKY, especially activities that threaten wildlife.

1.3 PHYSIOGRAPHY AND CLIMATE

The DPKY protected areas are situated along the western end of the Phanom Dongrak range which delineates the southern margin of the Khorat Plateau of Thailand. For part of its length, chiefly to the east of the DPKY reserves, but including the eastern part of Ta Phraya, this range delineates the national boundary, which roughly follows the crest of the range, the anticline and plains below the Phanom Dongrak range lying in Cambodia.

The extreme west of the DPKY area, in the western part of Khao Yai is steep and rugged and lies on Permo-Triassic igneous rocks of the Khao Yai Volcanics Group. Southwards and eastwards these are replaced by Jurassic calcareous and micaceous siltsones of the Phu Kradeung formation and sandstones of the Phra Wihan Formation, Khorat Group (Geological Survey Division, 1984).

Further east, the whole of Thap Lan and the upland part of Ta Phraya, which lie on the rim of the Khorat Plateau, lie on quartz-rich sandstone of the (Jurassic) Phra Wihan formation Lowlands at the foot of the Phanom Dongrak scarp, including a small part of Ta Phraya around the headquarters, lie on quaternary colluvial deposits, in which rock fragments are mixed among sandy gravel and clays.

The Phanom Dongrak scarp is broadest in the west, at Khao Yai and Thap Lan - Pang Sida, which therefore have the largest areas of south-facing hill slope habitat. In Ta Phraya, the range abruptly narrows so that there is a comparatively steep and rapid descent from the rim of the Khorat Plateu to the plains some 200–300 m below.

Areas on the northern slopes of the Phanom Dongrak drain mainly via the Mun River into the Mekong River; those to the south drain mostly via the Prachinburi River into the Bang Pakong River which enters the Gulf of Thailand. The area is seasonally very dry receiving 1200–2000 mm rainfall per year roughly 80% of which falls during the SW Monsoon, from May to October.

The area is usually considered to lie in the northeastern part of Thailand (*sensu* Kloss, 1915; Deignan, 1963). In reality, it represents a transition zone between the higher rainfall Lower Central Plain and the drier northeast, the south-facing slopes of the Phanom Dongrak probably receiving more rain than the north slopes. Rainfall varies considerably with topography and elevation, higher elevations receiving greater rainfall than lower elevations. The highest mountains, rising to 1350 m, lie in Khao Yai at the western end of DPKY.

1.4 DETAILED DESCRIPTION OF DPKY RESERVES

The chief habitat parameters of the DPKY reserves are summarized in Table 1.

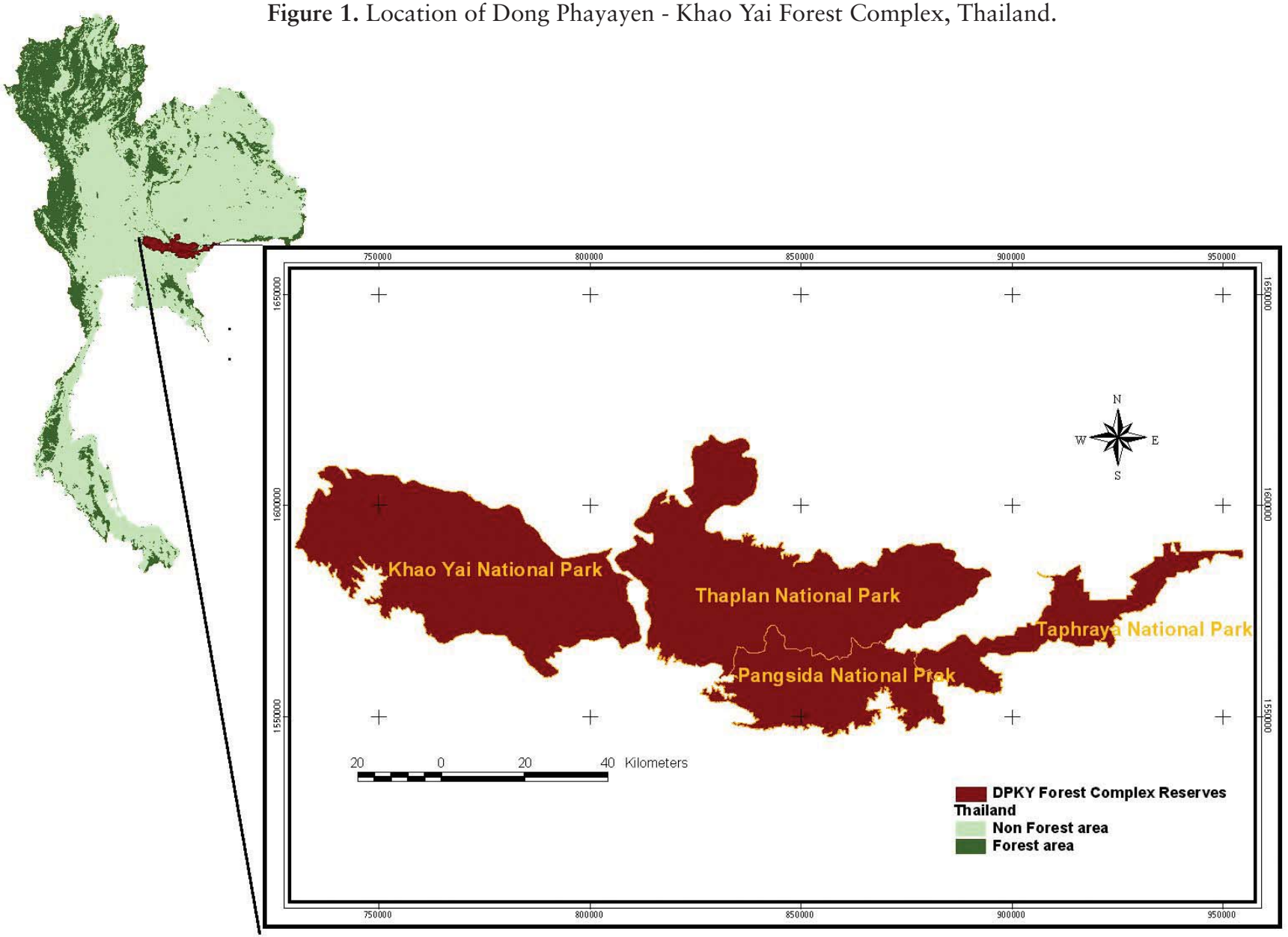
Table 1. Habitat parameters of Dong Phayayen – Khao Yai reserves[1].

Reserve (km^2)	Total area (km^2)	Elev. Range (m)	Habitats	Area
Khao Yai National Park (est. 1962)	2,168	100–1351	Hill evergreen Evergreen (>600m) Evergreen (<600 m) Mixed deciduous Scrub/deforested	75 804 1013 13 463
Sakaerat Biosphere Reserve (est. 1972)	81	100–762	Evergreen (>600m) Evergreen (<600 m) Dry dipterocarp Scrub/farmland	10 20 12 39
Thap Lan National Park (est. 1981)	1,617	100–992	Evergreen (>600m) Evergreen (<600 m) Mixed deciduous Dry dipterocarp (Scrub/deforested)	431 895 255 38 807
Pang Sida National Park (est. 1982)	844	70–849	Evergreen (>600m) Evergreen (<600 m) Mixed deciduous Scrub/deforested	127 282 173 151
Ta Phraya National Park (est. 1996)	594	120–562	Details not available; evergreen and mixed deciduous forest, scrub	

[1] Data from MASS Database, Center for Conservation Biology, Mahidol University

DPKY is not a contiguous forest area. It is internally fragmented (Goosem 1997) into 7 sections by north-south roads or major tracks (Fig. 1). A road entering from the north at Pak Chong and emerging north of Prachinburi completely bisects Khao Yai. The northern segment, from Pak Chong to the park headquarters, was constructed before the park was declared. The southern leg, from the former Tourism Authority of Thailand (present Khao Yai Forestry Training Center) complex, was newly bulldozed in 1982. A second highway to

Figure 1. Location of Dong Phayayen - Khao Yai Forest Complex, Thailand.



the east, Highway 304, separates the contiguous Thap Lan and Pang Sida block from Khao Yai. A 2 km-wide mosaic of cultivated land and patchy woodlots lies either side of this road forming a potential wildlife corridor between Khao Yai and Thap Lan in Nadee District, Prachinburi Province.

Sakaerat is isolated from the NE border of Khao Yai by private landholdings, and from Thap Lan, 5 km to the east, by Highway 304.

Ta Phraya is contiguous with Pang Sida, to the west and with Dong Yai Wildlife Sanctuary to the north and west, but is completely bisected by two roads, Highway 348 in the west, and a security road used by the Army in the east. The eastern third of Ta Phraya is a narrow finger of land extending only 2-6 km in width north of the Cambodian border.

Khao Yai

Khao Yai is rugged and mountainous in the west. It slopes gently eastward and southwards. The highest mountain, Khao Rom, is 1350 m above sea level. Approximately 75 km^2 (3.5% of the park area) lies above 1000 m. Khao Yai is the only one of the DPKY parks to support any montane habitat. There are small areas of limestone around Khao Luuk Chang, in the north-west of the park.

The north of the park drains via the Lam Takong, Lam Phra Phloeng and other tributaries of the Mun River. The south of the park drains (from west to east) via the Nakhon Nayok River, Khlong Nong Kaeo, and Sai Yai River and east of this, via the Lam Phraya Than. The Sai Yai and other rivers and streams further west are steep and rapid-flowing, running through gorges for part of their length.

Almost the entire area of Khao Yai is occupied by evergreen or semi-evergreen forest, with small areas of mixed deciduous forest around the northern margins. Much of this forest is tall, good-quality primary forest, with massive trees and is roughly evenly divided between foothills (<600 m) and upland (600–1000 m) forest. However, significant areas in the foothills zone, such as along the southern access road from the headquarters descending to Prachinburi, have been logged. In reality the transition to a montane facies starts below the 1000 m contour, so that even some areas around the headquarters of the park, such as at Mo Singto, and further to the west show some typically montane tree species.

Sakaerat Biosphere Reserve

Sakaerat Biosphere Reserve is not a protected area in the traditional sense, but a high level of human use for research since the establishment of the Sakaerat Experimental Station in the late 1960s, has helped give a level of habitat protection to the site.

Covering 78 km^2, most of the area lies below 600 m, and roughly two-thirds of the forest area remaining is evergreen/semi-evergreen, with the remainder being dry dipterocarp. There are no significant waterways within the site.

Thap Lan

Most of the area consists of heavily disturbed, logged semi-evergreen forest, with deforested and scrubby areas, and some plantations. The maximum elevation is 992 m, in the south-west of the park, but most of the park area lies between c. 250 m to 600 m.

Small areas of dry dipterocarp forest are present in the lowest elevations at the extreme northern boundary of the park. This habitat was probably once quite extensive outside the park boundary but has since been almost totally cleared for agriculture.

Most of the park watershead drains into the Mun River apart from a small area in the south-west, around the park headquarters, which drains into the Bang Pakong River.

Ta Phraya

Ta Phraya spans two discrete landforms already mentioned above: uplands at roughly 280–300 m elevation on the rim of the Khorat Plateau, in the northwest, and the entire eastern part of the park; and a lowland area along the valley of the Lam Sathon, at roughly 120 m, which includes the park headquarters, in the western third of the park. The steep scarp which delineates these two zones drops roughly 200 m within a distance of c. 1 km.

The lowland area drains via the Lam Saton and other smaller waterways into the Great Lake system of Cambodia, while the uplands drain into the Mun River.

The park vegetation mainly consists of semi-evergreen forest and scrub, heavily impacted by human use. A few areas outside the boundary, in lowlands to the east, support some dry dipterocarp trees among rice paddies and other cultivation but so far as known no significant extent of dry dipterocarp forest is present in the park.

1.5 HISTORY OF HUMAN USE IN DPKY

The entire area of DPKY is utilised by people, with disturbance and damage to wildlife habitats varying from low to serious. Access is facilitated by a network of roads and highways, especially in the eastern portions close to the Thai-Cambodian border.

Before its establishment as a national park in 1962, Khao Yai supported villages of "outlaws". These villagers cleared forest for agriculture around the present day park headquarters, and several other upland areas which today support grassland and regenerating secondary forest. These settlers also hunted and collected forest products, and would have had impacted greatly upon larger wildlife at that time. Sports hunting occurred in the park during the early days following its establishment (Lekagul and McNeely, 1977).

Information on past human landuse for Thap Lan, Pang Sida and Ta Phraya is more fragmentary. In addition to suffering hunting and other impacts from local users, Thap Lan was known to be targeted and actively hunted by sports hunters from Bangkok and other major towns during the 1980s and early 1990s. Such use by sports hunters is continuing in DPKY. All DPKY areas formerly supported some groups of insurgents during the 1970s and 1980s, who probably carried on some level of hunting.

All areas are still heavily infiltrated by forest-product collectors . A major non-timber forest product (NTFP) poached from Khao Yai and other DPKY reserves is aloewood or *mai hom*, the heartwood of the tree *Aquilaria crassna*. A fragrant oil is extracted from the wood of aloewood and this is traded in the Middle East, and north Asia (Hansen, 2000). Aloewood collecting has probably gone on for centuries in most of DPKY. Civil unrest in Cambodia during the 1970s and 1980s discouraged exploration of Ta Phraya and other border forests, although hunting of large mammals, especially elephants, was rampant (P. Klinklay, *pers. comm*). Until the late 1980s the area around the present-day Ta Phraya National Park headquarters supported a training camp for Khmer Rouge soldiers.

Small-scale encroachment around park margins continues. In the eastern part of DPKY this has been mainly due to clearance for agriculture. Further west, especially around the northwestern and southeastern margins of Khao Yai, some encroachment of the park area has been perpetrated by developers, establishing resorts and large estates. Timber cutting and slash-and-burn farming continue in several areas, notably around Khao Yai and Ta Phraya.

1.6 PREVIOUS BIOLOGICAL SURVEY WORK

Mammals

Published work on mammals in Khao Yai National Park has almost entirely featured the gibbons of which there are two species, the White-handed Gibbon (*Hylobates lar*) and the Pileated Gibbon (*H. pileatus*). Joe T. Marshall, Jr. was the first zoologist to discover, initially on the basis of its distinctive duetted songs, the presence of the Pileated Gibbon in the park (Marshall *et al*., 1972). Further survey work showed the White-handed Gibbon to be prevalent in the western part of the park, and the Pileated Gibbon in the east (Brockelman, 1978; Brockelman and Gittins, 1984; Marshall and Sugardjito, 1986). The transition from *lar* to *pileatus* is relatively steep and occurs approximately from the present Training Center and Haew Suwat Falls, east to the slopes of Khao Laem.

The duetted songs of the gibbons are highly species-specific (Marshall and Marshall, 1976), and the song pattern of either males or females can be reliably used to distinguish the species. Some hybrids occur in the narrow zone of overlap (Brockelman and Gittins, 1984; Marshall and Brockelman, 1986) which can also be recognized by voice. Analysis of the song patterns of adults of mixed-species pairs and their female offspring has indicated that these patterns are inherited and not learned (Brockelman and Schilling, 1984). The subspecific status of *Hylobates lar* in Khao Yai, and the inheritance of color phase in *H. lar*, have been discussed by Brockelman (1985, 2003).

Since 1980 a long term research site has been established in the Mo Singto area near park headquarters for study of the behavior and ecology of White-handed Gibbons. The first studies here focused on the forms and functions of loud songs (Raemaekers and Raemaekers, 1984, 1985a, 1985b; Raemaekers *et al*., 1984). Later studies have concerned gibbon diet and foraging (Bartlett, 2003; Whitington and Treesucon, 1992; Whitington, 1992) and social behavior (Brockelman *et al*., 1998; Brockelman and Srikosamatara, 1984; Nettelbeck, 1998a;

Reichard, 1995; Reichard and Sommer, 1994, 1997). Potential predation on gibbons has been analyzed by Uhde and Sommer (2002).

Four Ph.D. theses on gibbons have been based on research in Khao Yai Park (Bartlett, 1999; Nettelbeck, 2003; Reichard, 1996; Suwanvecho, 2003). The last of these concerned the ecological relations between *Hylobates lar* and *H. pileatus* in the Khlong Sai area east of the Training Center. A report of interactions between gibbons and Binturong *Arctictis binturong* has been published by Nettelbeck (1998b), who also reported an instance of attempted predation of a barking deer *Muntiacus muntjak* by a python *Python reticulatus* and the scavenging of the egested carcass by a pack of Dholes *Cuon alpinus*, as gibbons watched from above with alarm (Nettelbeck, 1995). Records of binturong from Khao Yai were also documented by Nettelbeck (1997).

The only other published work on *H. pileatus* in Thailand is that by Srikosamatara (1984) and Srikosamatara and Brockelman (1983, 1987) carried out in Khao Soi Dao Wildlife Sanctuary. A study of the use of duetted songs in censusing gibbon populations was carried out on *H. pileatus* in Khao Soi Dao (Brockelman and Srikosamatara, 1993), and included some data on duet frequency obtained in Khao Yai populations. Brockelman (1975; 1983a, 1983b) has written several reports on the conservation of the Pileated Gibbon, which is still declining due to poaching in protected areas of the Southeast.

In 1996 a permanent forest dynamics plot was initiated in the Mo Singto area with the primary objective of studying gibbon diet and foraging behavior in more detail (Brockelman, 1998a). The plot is 30 ha in area and contains nearly the entire home range of one study group. The plot is being used for continuing studies of gibbon and bird ecology and forest dynamics. Interestingly, one of the fruit species consumed by gibbons on the plot has turned out to be a rare species of tree new to science (Brockelman *et al.*, 2002).

In 1993 the Conservation Breeding Specialist Group of IUCN, In collaboration with the Association of Zoological Parks and Aquaria, and the Royal Forest Department, conducted a gibbon population and habitat viability analysis (PHVA) in Khao Yai National Park. This resulted in some reports and evaluations (Brockelman, 1994a, 1994b; Tunhikorn *et al.*, 1994; Tilson *et al.*, 1997), but little action to save the gibbons.

Published in 1996, *Mammals of Khao Yai National Park* (Srikosamatara and Hansel, 1996) was the first Thai/English language practical guide to wildlife in the park and has been in great demand by amateur naturalists and park visitors. It has been widely used in training park staff (WCS 2000, 2001, 2002b). *A Mammal Guide for Pang Sida National Park* was also published in 1996 (Mauric, 1996). The mammal lists are compilations of expected and confirmed species from the Mahidol University MASS database (P.D. Round, pers. comm.). In 2000 *Mammals of Sakaerat* was published by the Thailand Institute of Scientific and Technological Research (TISTR, 2001).

In 1996 Yongyut Trisurat completed a Ph.D thesis concerning distributions of large mammals at Khao Yai (Trisurat *et al.*,1996). Using kriging methods he determined concentrations of large mammals and identified a set of core areas where park management activities should be focused. In 2000, Wildlife Conservation Society, WildAid and the Royal Forest Department initiated a wildlife protection program aimed at reducing threats to large mammals and

birds targeted by poachers. A monitoring program was established to estimate baselines for target species for use in park management (Lynam *et al*., 2003).

Birds

Coverage and level of knowledge within DPKY varies greatly for both birds and mammals. The best known sites are undoubtedly Khao Yai National Park and Sakaerat Research Station, where there are observations on birds spanning roughly 40 years.

The work of the early collectors, such as E. G. Herbert (Baker, 1919, 1920) and H. M. Smith (Riley, 1938) was mostly centred in the lowlands, along the railway line linking Bangkok to Khorat. Gyldenstolpe also collected in this region: Thonglongya (1967) identifed Sakaerat as the correct type locality of *Pycnonotus melanicterus johnsoni* (Gyldenstolpe). During the early Twentieth Century, Khao Yai and the other reserves of DPKY lay in a large, inaccessible, and more or less unexplored forest block. Nonetheless H.M. Smith apparently collected at Khao Laem (Kao Lem), inside present-day Khao Yai National Park (Riley, 1938).

The chief references for Khao Yai, covering the first decade following its establishment as a national park, are Dickinson (1963, 1967); Dickinson and Tubb (1964, 1966); McClure (1974) and Pfanner (1974). A small collection of specimens was made during the early 1960s and summarized in Dickinson and Chaiyaphun (1968). Most of the specimens were stored at the Department of National Parks, Wildlife and Plant Conservation (DoNP), Bangkok. However, only a few of these could be located when the author examined the DoNP collection in winter 2000–2001.

In the 1970s and 1980s, the Khao Yai headquarters area was much visited by Thai and foreign birdwatchers. Conservation Data Center (1989) provided an update of the species known. However, many further species have since been added.

Even though Khao Yai is the best-known of the DPKY reserves, coverage is still very uneven. Conservation Data Center (1989) estimated that most birdwatching effort had been concentrated within 0.5% of the park area, and ten years later this statement is still true.

The chief sources of information for Sakaerat are Tongyai (1980); Ngampongsai and Lauhachinda (1988); Saiwichian et al. (1988), TISTR (2000), Wachara Sanguansombat (unpubl.) and the author's own observations, July 1981 and January 1985.

The chief source of information for Thap Lan are the RFD Master Plan (Anon. undated), an unpublished list compiled by Mr. Pornchai Wisutatharn (DoNP) and a few observations by Dr. Suwanna Mukachornphan (*in litt*. to P.D. Round).

For Pang Sida, Alain Mauric (*in litt*. to P.D. Round, May 1994) provided a reasonably comprehensive preliminary inventory based on his own observations, those of Steve Henson, Kamol Komolphalin (BCST) and Ms. Bubphar Amget (DoNP) during June 1993 to February 1994. Further observations were contributed by Krisanapol Wichapant and Somyot Ngowattana (1994) and some species are listed by the RFD Master Plan for the park (Royal Forest Department, 1987). These observations have been incorporated into the MASS database at Center for Conservation Biology, Mahidol University

A short preliminary inventory for Ta Phraya was compiled by Jarujin Nabhitabhata based on surveys and interviews conducted in November 1998 (J. Nabhitabhata, *in litt*.).

In order to make as complete a faunal listing of birds for DPKY as possible, and in order to take account of the period between compilation of this report, in June 2000, and its publication, all significant records known to us up to January 2003 have been included.

1.7 STUDY AREAS

Fieldwork for both birds and mammals during recent (1998-2000) surveys focused on three areas within the DPKY: Ta Phraya, which has never received anything more than a highly cursory bird survey (J. Nabhitabhata, unpubl. observations); Thap Lan, also relatively little known, and Khao Yai. Although as stated above, parts of Khao Yai are quite well known by birdwatchers and amateur naturalists, most of the area has never been formerly surveyed by biologists. Surveys for birds at Khao Yai were therefore centred on the little known northern and eastern margins of the park. Mammal assessments included the rarely traversed west, central and eastern areas of the park.

Pang Sida was not considered for survey because of time limitations and because of the existence of a detailed preliminary inventory of birds and mammals for the park. Additional information from recent reports of birds from Pang Sida are included in this assessment.

Sakaerat Biosphere Reserve is also included in this compilation because both geographically and biologically it constitutes part of DPKY and because of the existence of a good baseline bird and mammal species inventories. Conversely, Dong Yai, which is part of the DPKY, was not included because permissions to conduct surveys in this reserve were not available.

PART II. RESULTS

2.1 BIRDS

2.1.1 Survey Aim

To assess the conservation and biogeographical importance of DPKY for birds

2.1.2 Survey Objectives

- To compile a reliable baseline inventory of birds for the entire DPKY
- To concentrate survey coverage on lesser known areas and habitats within DPKY
- To collect information on Key Species and those species for which DPKY is of particular conservation importance
- To train Royal Forest Department staff and recent university graduates in basic survey methods and in bird identification
- To assess major threats to bird species, especially Key Species, and to provide recommendations for future management of DPKY reserves for the conservation of these species and habitats.

2.1.3 Survey Areas and Routes

Survey locations for birds are shown in Fig. 2.

KHAO YAI NATIONAL PARK
Khao Yai was visited during 5–21 November 1999 (PDR, Dome Pratumtong and Wachara Sanguansombat) and on 10 December 1999 (PDR only). Further observations around the headquarters area were made during 10-13 February 2000 and 27–28 April 2000 (PDR only).

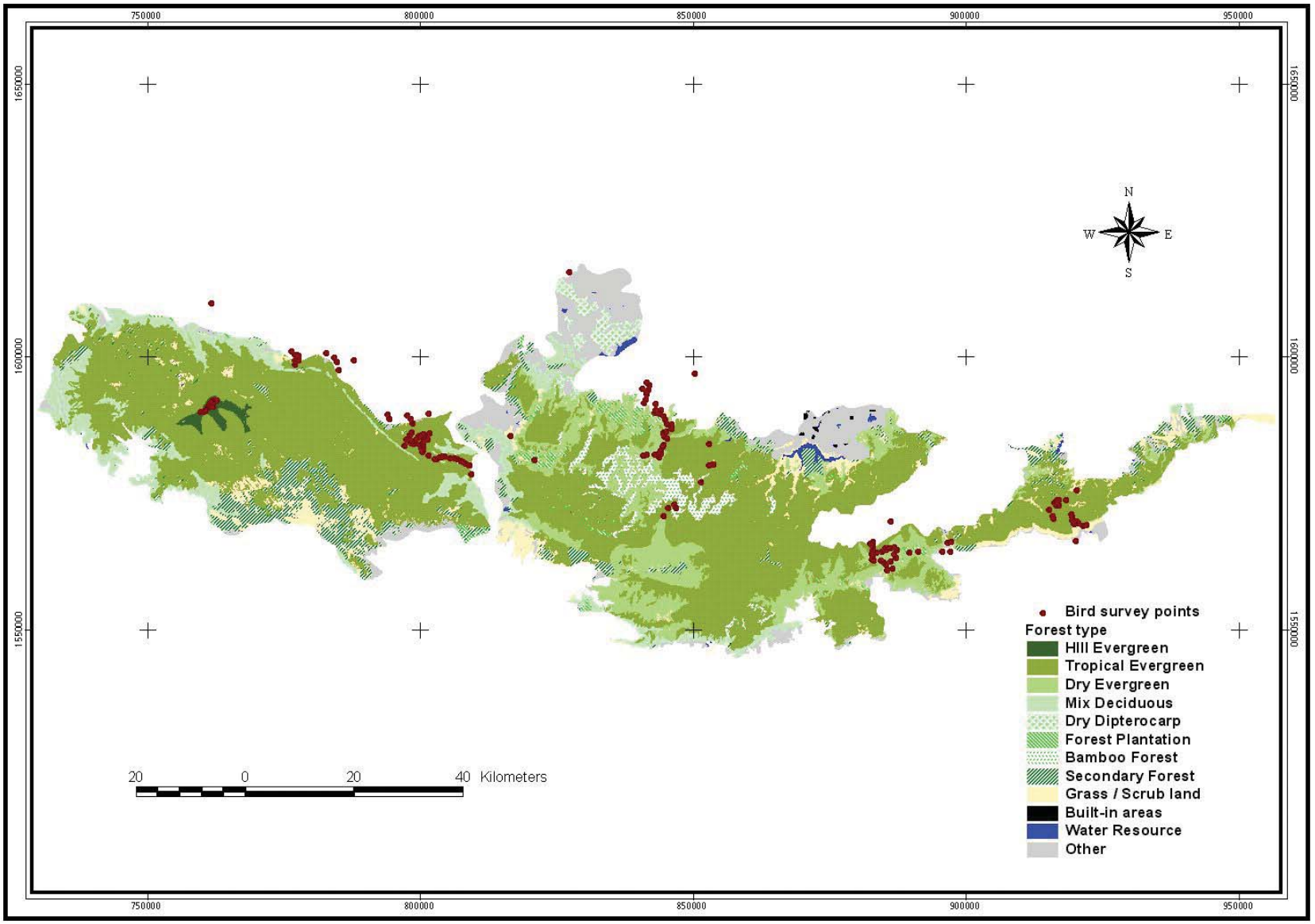
Short duration field surveys were aimed at targeting key areas of unusual habitat (*i.e.* the highest mountain top, and the lowest valley bottoms, and marginal areas around the park perimeter) which had not previously been covered. Surveys were initially centred on the largest montane area in the park, so as to search for additional montane species and to obtain a good quantitative description of the montane bird community in the park.

The rest of the survey concentrated on the Lam Phraya Than Drainage, because this is one of the least known areas in the park, is a large, low-lying area, in which the bird community was expected to differ substantially from that around the park headquarters. In addition, some riparian species were expected along this large lowland waterway.

THAP LAN NATIONAL PARK
Other than a brief preliminary visit to the WFT Project site on 14 November, Thap Lan was visited during 13–24 December 1999. Personnel were PDR and Wachara Sanguansombat.

Emphasis was placed upon lowland dry dipterocarp forest on the northern park boundary, large lowland waterways, (Lam Chae and Sap Pet) and the better quality moister or less disturbed forest around the Lam Praeng Guard station.

Figure captions 2. Survey point locations for birds in Dong Phayayen - Khao Yai protected areas.



TA PHRAYA NATIONAL PARK
Ta Phraya was visited during 8–19 September 1999. Observers were PDR, Klos Bunthavee, Dome Pratumtong and Wachara Sanguansombat.

Because previous observations at Ta Phraya were so scant, the objective was to visit as many representative examples of different habitats, including disturbed areas, as possible to compile a basic inventory.

2.1.4 Rationale for Field Methods

Despite the effort made in establishing protected areas in Thailand, systematic survey and evaluation of the biological attributes and conservation value of these areas has lagged far behind. The only comprehensive assessment of protected area coverage for any major group of animals was that of Round (1988) for birds.

Most species inventories for existing DoNP protected area management plans have very limited utility because they are usually based on low survey efforts and poor coverage. They tend to list only the few common species found by the surveyors in a very limited time-frame, and often contain unauthenticated records obtained from interviews. Moreover, while species lists for different wildlife taxa may be generated rapidly from rapid assessment surveys (RAS), and estimates of species richness may provide an indication of the biodiversity in an area, species lists by themselves are not sufficient for formulating management strategies to conserve wildlife. It is important to understand which habitats support which species, where these habitats are located, the abundance of species in these habitats, and the threats to the species and habitats. Such information is especially important for conserving rare and endangered species.

Abundance data is rarely presented in park management plans, and where given is usually highly subjective. Survey efforts usually focus on well-known habitats or areas, so that the geographical distributions of species within a reserve, or association with rare habitats, is almost unknown. A notable exception to this general rule was the surveys of Thung Yai Wildlife Sanctuary, Kanchanaburi/Tak province, Western Thailand carried out by Naris Bhumpakapun (reported in Nakhasathien *et al.*, 1987) where some distributions were mapped on a grid.

This study attempted to rectify the deficiencies described above by conducting field assessments so as to achieve repesentative coverage of habitats and area. Methods were used to obtain reliable information on species presence-absence and where possible abundance.

2.1.5 Study Methods

Within the areas studied, emphasis was placed upon walking through as large a geographical area as possible which was compatible with efficient bird recording. Most fieldwork was carried out in the forest interior, using existing paths and trails, including game-trails, as much as possible, though some observations were made along forest roads in all sites. GPS readings were taken at roughly 30-minute intervals and the route walked was plotted on 1:50,000 maps.

Observations were usually made by 2–4 persons, including two observers and one or two park workers or forest guards. All persons used binoculars. Binoculars were provided to park staff for their use.

Fieldwork was commenced immediately after first light and continued throughout daylight hours. Nocturnal birds were recorded around camp-sites by listening for calls. In addition, some short nocturnal excursions were made both on foot and by vehicle. Birds were detected by sight and by listening for calls. Since most species were already familiar to the author, the majority of calls were recognized immediately. This greatly facilitated detection and estimation of relative abundance.

Wherever sustained observation in a recognizably uniform habitat-type or at a single locality was possible, data on the bird community was collected using the "list of 20 species method" (MacKinnon Lists) outlined by MacKinnon and Phillipps (1993) and Bibby *et al*. (1998). This is a standardized sampling method which, at least when used by a single observer, allows accurate quantitative comparison of species-richness among sites or among different habitats (O'Dea *et al*., 2004). The abundance of each species was scored by its frequency of occurrence (number of lists in which the species was found, relative to the total number of lists in the sample). Some merits of this method have been discussed by Poulsen *et al*. (1997). Use of this method was confined to diurnal birds, and those owls (*e.g*., *Glaucidium* spp.) which are semi-diurnal. Aerial feeding birds such as swifts and swallows, which range widely over forest and bon-forest habitats, though recorded on the inventory, were not listed on MacKinnon Lists so as to avoid bias resulting from under-recording these species in closed canopy forest. Those aerial feeders more or less associated with particular forest habitats, such as Crested Treeswift *Hemiprocne coronata*, and Ashy Woodswallow *Artamus fuscus*, were recorded however. Calling birds were only recorded if considered to be within c. 50 m of the observers, so as to avoid bias in over-recording species with loud and persistent calls such as barbets, *Megalaima* spp.

A species accumulation curve was drawn for each site surveyed. In the course of analysis, the order of lists should ideally be randomized before drawing an average species accumulation curve. When the curve reaches a plateau, the avifauna has been adequately sampled. To save time in analysis, the curves were not randomized since the pattern of species accumulation, giving a good intuitive measure of species richness, was already evident.

One drawback of the MacKinnon Lists method is that each species, regardless of abundance, is only recorded one per list. Species occurring in flocks might score the same as those occurring as solitary individuals since both can only be recorded at most once per 20 species. The numerical abundance of the most common species is therefore suppressed. This poses problems in analysis for those diversity indexes which measure even-ness (equitability) as well as species richness, such as Berger-Parker Index, otherwise a very simple and useful index to calculate.

2.1.6 Results of survey

Overview
A total of 391 species of birds are known from DPKY.

- 358 Species are known for Khao Yai National Park
- 220 Species are known for Sakaerat Biosphere Reserve
- 284 Species are known from Thap Lan National Parl
- 238 Species are known for Pang Sida National Park
- 201 Species are known from Ta Phraya National Park

49 Key Species of birds of known or likely global or national conservation concern have occurred in DPKY. Among those for which the large block of more or less contiguous semi-evergreen forest in DPKY is thought to be especially significant in a national context are: Siamese Fireback *Lophura diardi*, Great Slaty Woodpecker *Mulleripicus pulverulentus*, four species of hornbills (Bucerotidae), Coral-billed Ground Cuckoo *Carpococcyx renauldi*, Javan Frogmouth *Batrachostomus javensis*, Pompadour Pigeon *Treron pompadora*, Green Imperial Pigeon *Ducula aenea*, Black Eagle *Ictinaetus malayensis*, Mountain Hawk Eagle *Spizaetus nipalensis*, Malayan Night Heron *Gorsachius melanolophus*, Silver Oriole *Oriolus mellianus*, Golden-crested Myna *Ampeliceps coronatus* and Hill Myna *Gracula religiosa*.

A number of nationally or globally near-threatened species were found to occur in association with lowland dry dipterocarp and other deciduous habitats around the margin of DPKY, especially near the northern border of Thap Lan National Park, in Sakaerat Biosphere Reserve, and around the margins of Ta Phraya National Park. Overall populations within DPKY are likely to be small, but because of the extremely limited areas of plains-level deciduous woodland remaining nationwide, nonetheless highly significant. Key Species of birds associated with this habitat are: Green Peafowl *Pavo muticus*, Streak-throated Woodpecker *Picus xanthopygaeus*, Blossom-headed Parakeet *Psittacula roseata*, Rufous-winged Buzzard *Butastur liventer*, White-rumped Falcon *Polihierax insignis*, and White-browed Fantail *Rhipidura aureola*.

The occurrence of a further three globally or nationally threatened species has been reported for DPKY. These are White-winged Duck *Cairina scutulata*, Comb Duck *Sarkidiornis melanotis*, Woolly-necked Stork *Ciconia episcopus*. These records are provisional and unconfirmed but deserve further investigation.

Preamble
The Results section is divided into two sections: Survey Findings and Species Accounts.

Survey findings
Detailed survey findings for each of the sites surveyed are first reported for each park. This includes a brief description of topography, vegetation, and human use as well as more detailed description of the bird community.

Comparison among sites and detailed analysis of bird communities follows.

Species Accounts

Records obtained during the present survey from the three parks covered (Khao Yai, Thap Lan and Ta Phraya) are combined with all previous records known or reported, published and unpublished, for Pang Sida National Park and for Sakaerat Experimental Station as well as for the three parks covered during the current survey, so as to provide a complete avifaunal listing for DPKY. The full species lists are presented in Appendix 1. Sequence of species and nomenclature follows Round (2000).

In the text, detailed listing and discussion of records is provided for:

- Key Species. Those species listed as at risk: *i.e.*, those nationally or globally threatened or near-threatened, following Round (2000). This includes a few species (*e.g.*, Blossom-headed Parakeet) which, though not listed by Round (*op. cit.*) are nevertheless of conservation concern, and for which the populations in DPKY are especially significant in the national context.

- Noteworthy species. Those species for which the provenance of some or all past records is not clear; or which are scarce or little-known in Thailand; or for which records from DPKY are a significant extension to the known range.

Those species previously reported for one or other of the DPKY parks which are rejected as unconfimed or erroneous are listed in Appendix 3, with discussion of the reasons for rejection.

Survey Findings By Protected Area

Khao Yai National Park

Detailed observations were made at at four discrete sites in Khao Yai (Khao Rom, KY3, upper Lam Phraya Than, and lower Lam Phraya Than) during November 1999, and 61 x 20-species lists were amassed. In addition, a few opportunistic observations were made around the headquarters area during November 1999 and February 2000. A total of 190 species was found during the survey.

In addition, another 29 species have been added to the park list since CDC, 1989 (Data held on file at CCB Mahidol University). This includes a few past records which have been re-assessed in the light of current knowledge. The present park list therefore stands at 358 species (Appendix 1).

Khao Rom

The habitat was more or less uniform montane forest at 1100–1331 m elevation. The forest was evergreen, containing a few conifers *Podocarpus* spp. and *Dacrydium* sp. A description of typical montane vegetation in Khao Yai NP, obtained from the neighbouring peak, Khao Khieo, is given in Smitinand (1968). The canopy height and cover are reported in Brockelman (1998b).

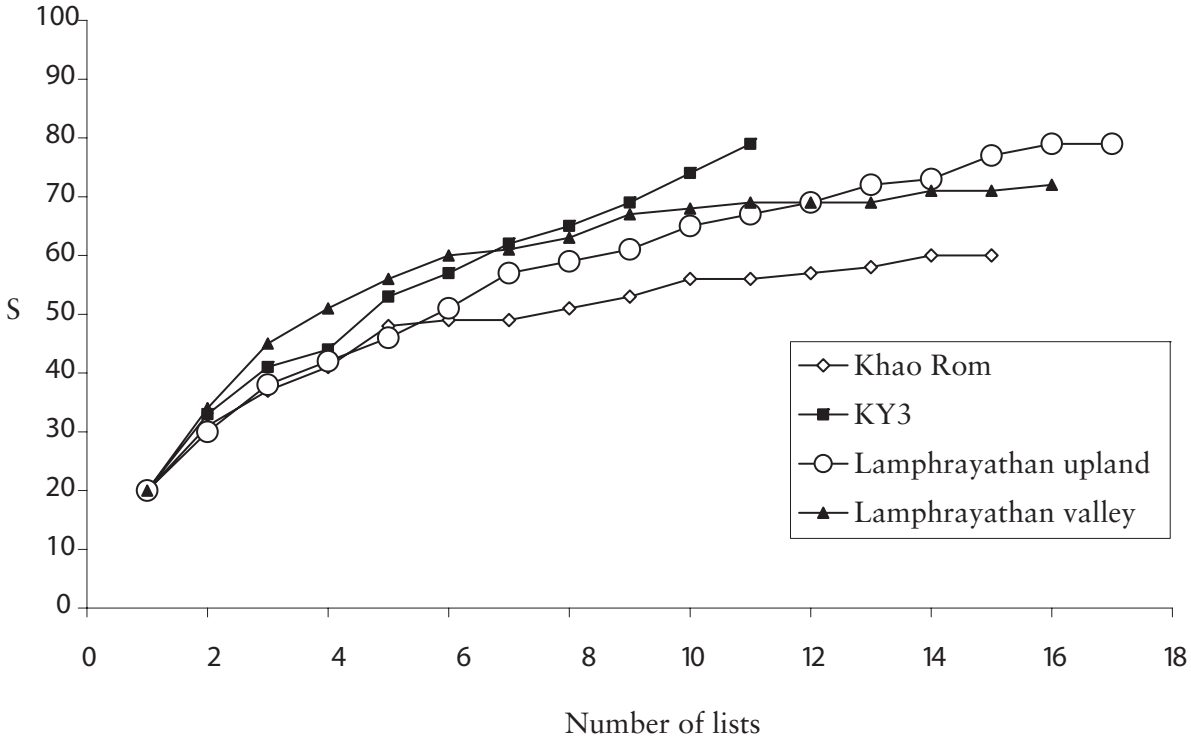
The forest was of only moderate height, with dense understorey and tangles. *Pandanus* was frequent. Small open and rocky areas along the ridgetop were overgrown by *Rubus* and other shrubs.

The ground fell away precipitously steeply to the north, but to the south, there was a gentle slope, so that there was a slow transition to submontane forest with declining elevation. This allowed some plants and animal characteristic of submontane elevation to persist at higher elevation than they do in many other, steeper, areas.

There were almost no signs of recent human use until the summit ridge began to curve away to the south-east (UTM 627920), where a few understorey saplings had been cut as trail markers. This may indicate, not surprisingly, that forest product collectors or hunters, if any, enter the area from that direction rather than from the road leading to the summit of Khao Khieo. A low level of human use would suggest that there are few resources in this area of particular interest to collectors of forest products (possibly the area is too high in elevation to support the tree *Aquilaria crassna*, which produces mai hom).

60 species of birds were recorded on 15 lists, the species accumulation curve flattening out at a lower S than for lower elevation sites (Fig. 3a).

Figure 3. a. Accumulation of bird species with sampling effort at Khao Yai National Park.



Few large birds were found. Silver Pheasants *Lophura nycthemera* were seen and heard; one Coral-billed Ground Cuckoo was heard calling below the summit of Khao Rom at an unusually high elevation.

Few specifically montane species were found and no new species were added to the park list from this site. Of particular note, however, was White-tailed Leaf Warbler *Phylloscopus davisoni*, (known for the park by one previous sight record,(author, July 1985), and listed in CDC (1989). This proved to be abundant throughout the forest around the summit and was recorded on two-thirds of lists. Two other montane species, White-browed Shrike Babbler *Pteruthius flaviscapis* and Chestnut-fronted Shrike Babbler *P. aenobarbus*, originally listed by Dickinson (1967), were scarce, and seen on 26.7% and 13.3% of lists respectively.

No partridges, *Arborophila* sp., were heard thoughout the period, though at least one species, Scaly-breasted Partridge *A. chloropus* should be present. The generally wet weather throughout the five days spent on the mountain probably inhibited this and many other species from calling. Mountain Imperial Pigeon *Ducula badia* was, expectedly, moderately abundant and found on 40% of lists. Wing noise of large hornbills (either Great Hornbill *Buceros bicornis* or Wreathed Hornbill *Aceros undulatus*) was heard on only one occasion.

The most frequently recorded species were Siberian Blue Robin *Luscinia cyane*, recorded on 100% of lists, Black-crested Bulbul *Pycnonotus melanicterus* (93% of lists) Black-throated Sunbird *Aethopyga saturata* and Omei Spectacled Warbler *Seicercus omeiensis* (87%); Ashy Drongo *Dicrurus leucophaeus* and Striped Tit Babbler *Macronous gularis* (80%); Buff-bellied Flowerpecker *Dicaeum ignipectus* (73%); White-tailed Leaf Warbler (66 %, mentioned above), Hair-crested Drongo *Dicrurus hottentottus*, Dark-necked Tailorbird *Orthotomus atrogularis* and Yellow-browed Warbler *Phylloscopus inornatus* (60%); Moustached Barbet *Megalaima incognita*, Black-throated Laughingthrush *Garrulax chinensis*, White-browed Scimitar Babbler *Pomatorhinus schisticeps* and White-bellied Yuhina *Yuhina zantholeuca* (53%); Black-winged Cuckooshrike *Coracina melaschistos*, Bar-winged Flycatcher-shrike *Hemipus picatus* and Ashy Bulbul *Hemixos flavala* (47%).

Ashy Drongo was apparently represented by two subspecies: dark birds, either resident *D.l. bondi* or migrant *D. l. mouhoti*, and a pale migrant form, probably *D. l. salangensis*, since it did not appear to be as pale, or have such clearly defined white cheeks, as *D.l. leucogenis*.

Although Little Pied Flycatcher *Ficedula westermanni* was listed for the park by Dickinson (1967) and by McClure (1974), this normally conspicuous montane species was not found, and it is possible that previous records may have resulted from misidentification of Bar-winged Flycatcher-shrike. This was the second least diverse site of the 12 sites surveyed, as measured by a range of diversity indices (Table 2). This was to be expected, since the lowland avifauna attenuates rapidly across the montane transition, while the Khao Yai mountains are of too limited extent to support the richer montane fauna found further north (*e.g.*, at Phu Khieo and other sites in the Dong Phaya Fai range).

The lower diversity of this site, as compared with other study sites in DPKY, should not be allowed to obscure the fact that it contributes significantly to the species richness of DPKY as a whole. The distinctness of the montane/upper sub-montane bird community at Khao Rom could be judged from the fact that the Sorensen qualitative index of similarity (S) for Khao Rom compared with the other eleven sites surveyed was only 0.19-0.53 (Table 3). Moreover, there were 14 species that were recorded exclusively at Khao Rom during the present survey (Table 2). This sets it apart from all other sites surveyed. Some species (e.g., Silver Pheasant) admittedly are found lower down, such as around Khao Yai park headquarters area, and in higher elevation parts of Thap Lan. Others, however, are genuinely and exclusively montane, such as the two shrike babblers *Pteruthius* spp., and White-tailed Leaf Warbler, and are therefore not liable to be found elsewhere in DPKY.

KY 3 (Ban Pong Chanuan/Ban Takhian Ngam)
This site was close to the abandoned village of Ban Pong Chanuan, UTM c. 777998, and lay some 7km west of the Ban Takhian Ngam (KY 3) guard-station.

The habitat was varied, from low stature, secondary thorny dry evergreen forest, with a few *Afzelia* and *Lagerstroemia calyculata* trees to more open forest interspersed with grassy patches. Stands of taller trees forming a mixed deciduous facies were found closer to the boundary road and constituted the first significant stand of tall lowland/plains forest encountered while driving eastwards around the northern park boundary from the park gate on the Thanarat Road.

Overall, therefore, the site had a more deciduous aspect than any other surveyed in Khao Yai. The elevation was plains at 440–450 m to foothills at 520–530 m. There was a more or less sudden transition to farmland north of the park boundary road.

The area was heavily disturbed and used by people, owing especially to its proximity to farmland. A discarded shotgun shell case was seen at one location, and three unarmed villagers were met in the forest, reportedly searching for mushrooms.

Within the low, thorny, secondary forest itself, bird diversity was relatively low, with a predominance of smaller, more ecologically tolarant species. More species, including a few scarcer forest birds species characteristic of deciduous forest, were found in the edges, the relict tall trees and the ecotone with farmland.

A total of 79 species of birds were recorded on 11 lists (Table 2).

The predominant species were Siberian Blue Robin and Pale-legged Leaf Warbler *Phylloscopus tenellipes* (82% of lists); Green-billed Malkoha *Phaenicophaeus tristis*, Black-crested Bulbul, Dark-necked Tailorbird, Two-barred Warbler *Phylloscopus plumbeitarsus* and Yellow-browed Warbler (64%); Black-naped Monarch *Hypothymis azurea*, White-rumped Shama *Copsychus malabaricus* and Striped Tit Babbler (55%); Black-headed Bulbul, Stripe-throated Bulbul *Pycnonotus finlaysoni* and Crimson Sunbird *Aethopyga siparaja* (46%). Scaly-breasted Partridge and Red-breasted Parakeet *Psittacula alexandri*, among more vulnerable species, were present in good numbers (27% of lists each) and both Thick-billed Pigeon *Treron curvirostra* and Orange-breasted Pigeon *T. bicincta* were present, through scarce. A few Hill Mynas were also present. This species is scarce or reduced in heavily disturbed areas.

Also of note was a sighting of Collared Falconet *Microhierax caerulescens*, believed to be the only post-1970 sighting for the park; a single Grey-capped Woodpecker *Dendrocopos canicapillus*, and a single Crested Treeswift *Hemiprocne coronata*. These are both believed to be the first records for the park.

The area was most similar to the lower Lam Phraya Than area of Khao Yai (S =0.66), Lam Chae and the Lam Praeng areas of Thap Lan (S = 0.63 and 0.62 respectively), and least resembled Khao Rom (S=0 39; Table 3). Five species were found exclusively at this site during the current survey.

This was the most diverse site surveyed as measured by the Simpson index and the second most diverse as measured by three others (Shannon-Wiener, McIntosh and Berger-Parker indexes: Table 2). This might seem surprising because overall quality of the habitat did not appear to be high, and there was significant disturbance. It probably results from the juxtaposition of farmland, deciduous woodland and evergreen/semi-evergreen woodland.

Table 2. Comparison of diversity parameters for birds by survey site using the 20-species method.

Park	Khao Yai				Thap Lan			Ta Phraya				
Site	KY3	Upper LPT	Lower LPT	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng	HQ-valley	Nong Arlang	Chong Takhieu	Sra Sam	Gully
No. individuals N	220	340	320	300	480	400	180	300	160	280	180	200
Species richness S	79	79	72	60	89	89	74	74	60	73	55	60
No. exclusive species	5	2	3	14	19	2	2	6	4	3	2	2
Diversity Indices												
Shannon	4.13	4.05	3.95	3.8	4.06	4.18	4.10	3.99	3.88	3.97	3.72	3.84
Simpson	66.55	53.91	48.33	41.92	50.42	59.51	71.76	50.76	54.13	50.14	41.84	48.08
McIntosh	.922	.902	.896	.887	.893	.907	.930	.900	.916	.901	.896	.904
Berger-Parker	24.44	24.29	21.28	20.00	20.87	23.53	25.71	21.43	20.00	20.00	20.00	20.00

Table 3. Site-by-site comparisons of similarity of bird assemblages (Index given is Sorensen Qualitative Index CS).

Ta	Nong Arlang	.68									
Phraya	Scarp	.61	.53								
	Sra Sam	.49	.38	.69							
	Gully	.41	.32	.65	.70						
Khao	KRom	.19	.23	.28	.36	.41					
Yai	LPT_Up	.36	.30	.67	.50	.67	.49				
	LPt_v	.49	.39	.57	.52	.62	.36	.71			
	KY3	.52	.53	.61	.53	.54	.39	.61	.66		
Thap	LC	.42	.34	.60	.55	.65	.47	.69	.70	.63	
Lan	LamPr	.31	.33	.57	.52	.56	.53	.66	.64	.62	.66
	SS	.45	.48	.38	.32	.30	.26	.52	.43	.53	.41	.41
		HQ	Nong Arlang	scarp	Sra Sam	gully	K.Rom	LPT_Up	LPT_v	KY3	LC	LamPr
		Ta Phraya						Khao Yai			Thap Lan	

Upper Lam Phraya Than

The topography was gently undulating, at an elevation of around 400–500 m. The south bank of the Lam Phraya Than was dominated by very tall, good quality semi-evergreen forest, with many huge trees. There were many figs *Ficus* sp., though very few were found with ripe fruit; many tall *Dipterocarpus* sp. and a few *Lagerstroemia* trees. The understorey was rich in palms, including *Areca* sp., or *Areca*-like palms, and *Licuala* sp.

North of the Lam Phraya Than, around Khao Khat, the forest was more variable, and generally poorer in quality, with many areas lacking large trees, and dominated by herbage such as bananas and gingers, and dense thorny tangles. According to our villager guides, this area had not been systematically logged, but had been subject to fires in the past.

The Lam Phraya Than stream was moderately fast-flowing, of moderate width. Towards the lower (easternmost) boundary, it flowed into a gorge with a vertical drop of 100 m within about one km.

There was a high level of human use, with many recently used camps found throughout the area, and one active camp of one or two people. Some camps had large dumps of used D-cell batteries, and an abundance of other litter. These were mainly or entirely camps of *mai hom* (*Aquilaria* wood) collectors and cut stumps and trunks of *Aquilaria* were found throughout the area. Signs of rattan cutting were widespread, while nearly all the *Dipterocarpus* were being tapped for resin. Gunshots were heard within a few km of the village of Ban Khlong Sai at the northern edge of the area on 15 November. Feathers of Siamese Fireback were found at a camp. Around Khao Khat, our villager guides were extremely worried about tripping set gun-traps (*peun phuuk*) although none were actually seen.

Large birds were scarce, possibly as a result of an expected high level of hunting. Very few hornbills and pigeons were seen, with Oriental Pied Hornbills and Wreathed Hornbills each recorded at two locations. Both Thick-billed Pigeon and Pompadour Pigeon *Treron pompadora* were found. There was only one sighting of an imperial pigeon *Ducula* sp., thought probably to be Green Imperial Pigeon. *D. aenea*.

Although the distribution of frugivores is often clumped and related to the location of fruit resources, it is probable that the scarcity of these species was exacerbated by hunting pressure, since good numbers of smaller frugivores, especially the parrots, Vernal Hanging Parrot *Loriculus vernalis* and Red-breasted Parakeet, were recorded.

Records of woodpeckers were of particular significance. Both Lesser Yellownape *Picus chlorolophus* and Grey-capped Woodpecker were found. These are species normally regarded as typical of more open formations, occurring also in montane forest (Lekagul and Round, 1991). The presence of both species alongside other woodpeckers in tall, closed canopy, mature lowland forest is possibly indicative of a greater variety of foraging niches in this habitat, allowing more species per guild to co-exist than in more disturbed, or less botanically diverse, habitats. However, Great Slaty Woodpecker, normally associated with large trees in lowland forests, was not detected in the area.

A total of 79 species was recorded on 17 lists (Table 2).

The most frequently recorded species were Puff-throated Bulbul *Alophoixus pallidus*, Striped Tit Babbler and Little Spiderhunter *Arachnothera longirostra* (82% of lists); Pale-legged Leaf Warbler (77%); Dark-necked Tailorbird *Orthotomus atrogularis* and Yellow-browed Warbler (65%); Hainan Blue Flycatcher *Cyornis hainanus* (59%); Black-naped Monarch, Grey-eyed Bulbul *Iole propinqua* and Grey-headed Flycatcher *Culicicapa ceylonensis* (52.9%); Vernal Hanging Parrot, Red-breasted Parakeet, Ashy Drongo, Hair-crested Drongo, Black-crested Bulbul and Two-barred Warbler (47%); and Scaly-breasted Partridge, Black-winged Cuckooshrike, Greater Racket-tailed Drongo *D. paradiseus*, White-rumped Shama and Stripe-throated Bulbul (41%).

The area most resembled the lower Lam Phraya Than (S =0.71); the Lam Chae area of Thap Lan (S = 0.69); the Gully area of Ta Phraya (0.67), and the Lam Praeng (S = 0.66). It least resembled the village area of Ta Phraya (0.30; Table 3).

There were only two species of birds found here which were not recorded elsewhere. Avian species diversity was moderately high for a range of indices, but unexceptional. This seems surprising in view of the high habitat quality, and tall forest. However, since most survey was conducted in the interior of tall forest, forest-edge species, and to a lesser extent canopy species, which might have bolstered diversity elsewhere, would have been harder to detect.

This site emerged as having the second highest diversity as measured by the most simplistic index, Berger-Parker (Table 2), possibly indicating greater even-ness, as would be expected in a more diverse habitat.

Lower Lam Phraya Than

This site lay in the valley bottom of the Lam Phraya Thai, downstream of the gorge at an elevation of 100-200 m.

This area was heavily disturbed. On the furthest upstream stretches, the forest is mixed deciduous in character with many stands of large-culm bamboo, probably *Bambusa arundinacea*. Progressing downstream, the valley became more open, appearing to have been logged. Bamboo diminished and was replaced by extensive stands of bananas and gingers and many *Livistona* palms. There was no canopy, the few larger trees mainly being along the banks, or set well back from the river on the hill slopes. The secondary growth along the bankside was dense and evergreen in character. Taller trees remaining included *Afzelia*, and *Lagerstroemia*. The river itself was broad, with some shingle and exposed bedrock, but becoming deep, sluggish and muddy with progression downstream. Fire signs were abundant throughout. Signs of recent logging of the last *Afzelia* trees were found.

The river appeared to have very few fish in it. A gill net was set across the flow for one night and only one small catfish was found the following morning. Villagers reported that the Lam Phraya Than had been heavily fished by chemical-fishermen about 5–6 years previously.

There were many signs of old fires; the area is clearly heavily burnt during the dry-season, and also many signs of small-scale logging of the last large hardwood trees along the valley bottom. A major poachers'/forest product collectors' trail extended up the river from the eastern boundary of the park, from the vicinity of Bu Phram village.

A total of 72 species of birds was recorded on 16 lists Table 2).

The most frequently recorded species were Vernal Hanging Parrot, Little Spiderhunter (94% of lists); Striped Tit Babbler (88%); Pale-legged Leaf Warbler (75%); White-crested Laughingthrush *Garrulax leucolophus* (69%); Dark-necked Tailorbird (67%); Yellow-browed Warbler (65%); Red-breasted Parakeet, Black-naped Oriole *Oriolus chinensis*, White-rumped Shama, Black-crested Bulbul and Stripe-throated Bulbul (63%); Siberian Blue Robin (56%); Asian Fairy Bluebird *Irena puella* (50%).

The stands of bamboos supported Tickell's Blue Flycatcher *Cyornis tickelliae*, apparently the first confirmed record of this species for Khao Yai. Bamboo Woodpecker *Gecinulus viridis* was hoped for in this habitat, but was not found, and the only additional woodpecker was Black-and-buff Woodpecker *Meiglyptes jugularis*, an evergreen forest species. Frugivorous birds were in good numbers: Vernal Hanging Parrots and Red-breasted Parakeets were abundant; one large flock of c. 50 Thick-billed Pigeons was seen in a fruiting tree; there was a fairly high frequency of Hill Myna sightings (31.3% of lists); and Golden-crested Myna *Ampeliceps coronatus* was also recorded.

No kingfishers or larger waterbirds such as fish-eagles *Ichthyophaga* spp. were found along the Lam Phraya Than. This was disappointing and presumably reflects the relative sterility of the river following poison fishing. One large waterbird, probably a Malayan Night Heron *Gorsachius melanolophus* was seen at dusk on 19 November, over the river, on the park boundary, north of the Bu Phram Gard Station

Overall, this site showed a greater bias towards edge and secondary growth species, and less equitability than in the less disturbed sites, with most diversity indexes examined being relatively low. There were three species recorded exclusively at this site.

The closest correspondence was with the upper Lam Phraya Than (S = 0.71); with Lam Chae (S = 0.70) and KY 3 (S= 0.66) and the least with Khao Rom (S = 0.36) (Table 3).

Thap Lan National Park

56 x 20-species lists were amassed from three sites and, overall, a total of 195 species was found during the survey. This contributed a further 23 species apparently new for the park (*i.e.*, not reported either in the Master Plan for Thap Lan National Park or in the list maintained by Mr. Pornchai Wisutatharn on behalf of the park staff), so the current park list stands at 284 species (Appendix 1).

This is not yet a fair reflection of the area's diversity however. Because of generally more limited coverage, a number of species that have not yet been found are expected to occur in Thap Lan (*e.g.*, Coral-billed Ground Cuckoo) so that species richness should be close to that found in Khao Yai. This is discussed in Section 3.3. (Complementarity and conservation importance of the DPKY Reserves for birds).

Sap Sadao

This was an area of c. 3 km^2 of dry dipterocarp woodland close to the northern park boundary. To the north and east, this woodland rapidly gave way to farmland while west and south, there was a fairly rapid transition towards degraded semi-evergreen forest, with some cleared areas and reforestation plots. The elevation was around 280–320 m.

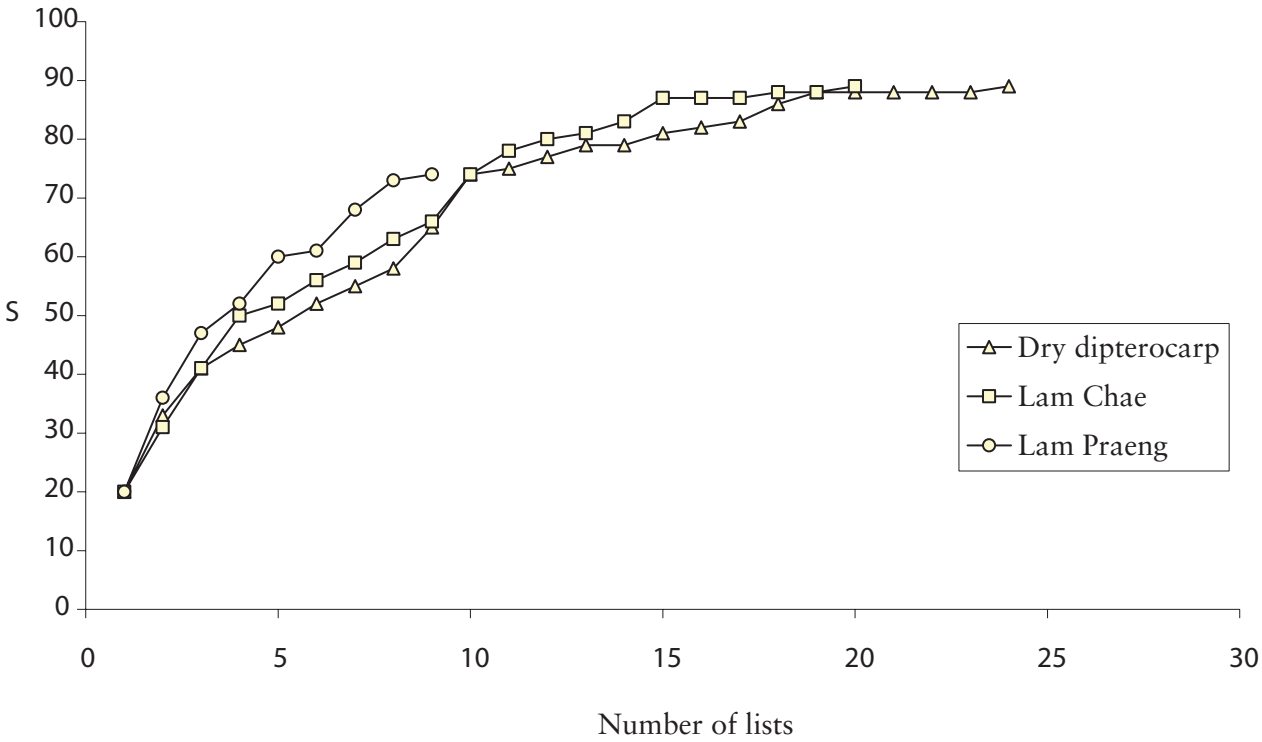
Overall, the forest was quite good quality. Although there were few larger trees, floristic diversity of the dry dipterocarp appeared quite high, with at least one, probably two, *Shorea* species (*S. obtusa* and *S. siamensis*) present at a high frequency along with *Dipterocarpus obtusifolius*. *Dipterocarpus tuberculatus* (*yang phluang*), which tends to predominate in those sites significantly degraded by excessive burning, was not overly common indicating better quality dry dipterocarp.

At the time the survey took place, annual fires had not yet started and the ground was covered with tall and lush grasses. Much charred wood from the previous dry seasons was in evidence, however. Signs of small-scale cutting for local use of timber were evident, particularly around the site margins.

In the context of the other parks surveyed, this was a unique piece of habitat, being the only stand of dry dipterocarp encountered. Smaller more disturbed areas exist elsewhere in Thap Lan, near Taling Chan (TL 8) guard station, not surveyed, and also in Sakaerat, for which some data on the bird community is available.

Sap Sadao supported a relatively rich bird community. A total of 89 species was recorded on 24 lists and the shape of the species accumulation curve (Fig. 3b) suggested that this habitat was not much less rich than the evergreen forests surveyed.

Figure 3. b. Accumulation of bird species with sampling effort at Thap Lan National Park.



19 Species at Sap Sadao were not found elsewhere during the current survey, and 4 others, including Brown Prinia *Prinia polychroa* and Burmese Shrike *Lanius collurioides*, were shared only with the lowland woodland around the headquarters of Ta Phraya illustrating the importance of dry dipterocarp at Sap Sadao in the context of DPKY. Some of these species,

such as Fulvous-breasted Woodpecker *Dendrocopos macei*, Streak-throated Woodpecker *Picus xanthopygaeus* and White-browed Fantail *Rhipidura aureola* appear to be restricted either to dry dipterocarp of plains-level or at the very least only inhabit the best quality dry dipterocarp sites.

Three species of particular conservation concern were found. These were White-rumped Falcon *Polihierax insignis* (globally near-threatened), Streak-throated Woodpecker and White-browed Fantail (both nationally threatened). Large numbers of Blossom-headed Parakeets were found. Although not listed as threatened by Round (2000) this species probably qualifies as of national conservation concern as it is has suffered a massive contraction in range and numbers throughout Thailand. A single male Streak-throated Woodpecker was only the second record for E Thailand of this very scarce species. Although three of these scarce species (Streak-throated Woodpecker, Blossom-headed Parakeet and White-rumped Falcon, are known from Sakaerat, two are from only single records and neither has been found there in recent years. White-browed Fantail, unaccountably, has not been found at Sakaerat and may be absent from the site. Sap Sadao is therefore the only site in NE Thailand from which this species is known, although it has found in similar dry dipterocarp habitat in southern Lao PDR (Duckworth *et al.*, 1999).

The predominant species were Sooty-headed Bulbul (96%), Large Cuckooshrike *Coracina macei* (79%), Ashy Drongo (71%), Red-breasted Parakeet (67%), Chinese Francolin *Francolinus pintadeanus*, Blossom-headed Parakeet, Red-throated Flycatcher (63%) Grey-capped Woodpecker, Indian Roller, Rufescent Prinia *P. rufescens*, (58%) Spotted Dove *Streptopelia chinensis*, Brown Prinia *Prinia polychroa*, Yellow-browed Warbler (54%), Indochinese Cuckooshrike *Coracina polioptera* and Burmese Shrike (50%).

Although some of the most frequently recorded species in dry dipterocarp woodland include some open country species, overall the diversity of birds in this habitat was high with a large number of species of moderate abundance coexisting. This included eight species of woodpeckers, and five species of minivets, more than was found in any other habitat covered during the survey. Mixed species feeding flocks incorporating one or two species of woodpeckers, one or two cuckoo-shrikes, 2–3 species of minivets, Common Woodshrike *Tephrodornis pondicerianus* and Chestnut-bellied Nuthatch *Sitta castanea* (another dry dipterocarp specialist) were frequent.

A few other dry dipterocarp or deciduous forest species (*e.g.*, Blue Magpie *Urocissa erythrorhyncha*) were not found during the current survey. Some may well have been missed by accident because of the brevity of the survey. However, in such a small fragment of forest as remains at Sap Sadao, it might be expected that some characteristic species would be scarce or absent through stochastic factors. Blue Magpies are also trapped for the cagebird trade.

The area showed a Sorensen index of only 0.26–0.52 when compared with the eleven other sites studied, indicating its relative distinctness from other habitats (Table 3).

Species diversity, as measured by the Shannon-Wiener index, was close with that found for the tall, good-quality evergreen to semi-evergreen forest of the Upper Lam Phraya Than (4.06; Table 2). Other indexes which take greater account of equitability are somewhat

depressed. The numerical predominance of a few very common species (in this case, Sooty-headed Bulbul) is typical of deciduous forest and savanna habitats.

Lam Chae/Sap Pet

This area was dominated by semi-evergreen forest in low hills and along a large stream of a large valley. The valley bottom lay at 300 m, and nearby hills rose to c. 400 m elevation.

The forest was dry and thorny with many understorey tangles, largely secondary, probably because of former logging, with a canopy only at around 10–15 m. Better quality evergreen forest was present on the hills and the further upstream points around the Lam Chae. In the region of the confluence with the Lam Praeng, the valley bottom was open with grassy areas and dense thickets, some stands of bamboo; scattered towering trees remaining and elephant grass along the riverbanks. There were many signs of dry-season fires.

The river was deeper and silty in this area, but rockier and rapid-flowing further upstream, with taller, denser and less disturbed forest extending down to the steeper banks.

Recent logging signs were found on the trail between Sap Sadao and the Lam Chae. In one place a large *Hopea odorata* had been recently felled with a chainsaw, and the timber partly removed. An old walkie-talkie radio battery was discarded nearby. A rough track, driveable by pick-up truck, extends to within a few km of this area, leading northwards past the cultivated areas, emerging by the reservoir near Sap Sadao. Presumably illegal timber is ferried out as planks on motorcycle or pickup truck, and hidden in or near the settlements, before being sent for sale. Diggings where bamboo rats had been extracted from their burrow system were also evident. The villager accompanying us mentioned that the area was frequently visited by villagers hunting softshell turtles along the river.

One large (c. 3 m) Rock Python *Python molurus* was seen. Crocodiles, presumably *Crocodylus siamensis*, were plausibly reported by our villager companion, and their presence along the Lam Chae is also apparently known to park staff. They are said to be mainly centred on the Lam Ta Saa, which, though not marked as such on maps, appears to be the local name for a further upstream stretch of the Lam Chae.

A total of 89 species of birds was obtained from 20 lists (Table 2). The predominant species were Striped Tit Babbler (85%), Dark-necked Tailorbird (75.0%); Black-crested Bulbul (70.0%), Asian Fairy Bluebird, Yellow-browed Warbler and Pale-legged Leaf Warbler (65.0%); Black-naped Monarch, Stripe-throated Bulbul (60%); Vernal Hanging Parrot (55.0%), Siberian Blue Robin (50.0%). Hill Mynas were moderately frequent (40.0% of lists), and there was one sighting of Golden-crested Myna, though Red-breasted Parakeets were scarce (10.0% of lists). One Collared Falconet was seen in a tall tree near Sap Pet.

Larger birds appeared scarce though both Siamese Fireback and Scaly-breasted Partridge were present, as was Oriental Pied Hornbill and Thick-billed Pigeon. The absence of large riverine birds was disappointing. The habitat was closely similar to areas in Lao PDR which support White-winged Duck. However, this species was not known to villagers or to park staff and it is therefore reasonable to assume that, if once present, it has now probably gone from the area, perhaps having been hunted out.

The area most resembled the Lam Phraya Than area of Khao Yai (S = 0.70 for lower Lam Phraya Than and S = 0.69 for upper Lam Phraya Than; Table 3), possibly due to the influence of lowland riparian vegetation at both sites. It also somewhat resembled Lam Praeng (S = 0.66) and the moist gully habitat at Ta Phraya (S =0.65). It was most dissimilar to the village area of Ta Phraya (S = 0.34). Only two species were recorded exclusively at this site.

This site had the highest diversity as measured by the Shannon Wiener Index (4.18; Table 2) but this pre-eminence was not vindicated by other measures.

Lam Praeng
This area was dominated by better quality moist semi-evergreen forest, transected by small streams. It was also somewhat higher than the other sites surveyed, at 400–500 m elevation. Bamboos and palms (*Areca* sp. or similar) were frequent in the forest understorey

The time spent in the area was too little to realistically assess human use. It would be expected that use by hunters and forest product collectors in the vicinity of the road would be less than in more remote areas, owing to frequent traffic of park staff between the Khlong Namman Guard Station, on the park boundary, and the Lam Praeng Guard Station.

Most observations were made in forest edge along roadside and in forest interior within 1-2 km of the road.

74 species were recorded from only 9 lists and there was a clear indication that the species accumulation curve climbed more steeply than in the other two sites in Thap Lan. This was in spite of the fact that, during the survey period, the weather was unusually and exceptionally cold, with daytime temperatures not much above 18° C, and a fresh northerly breeze. This caused a number of species to modify their behaviour (*e.g.*, normally arboreal-feeding *Muscicapa* flycatchers were sitting on the road). The cool weather also tended to supress bird song.

The most frequently recorded species were Ashy Drongo, Striped Tit Babbler (77.8% of lists), Yellow-browed Warbler and Pale-legged Leaf Warbler (66.7%); Orange-breasted Trogon, Black-winged Cuckooshrike, Hair-crested Drongo, Red-throated Flycatcher, Siberian Blue Robin, Puff-throated Bulbul, Dark-necked Tailorbird (55.6%).

One Great Slaty Woodpecker heard was the only individual recorded during the entire survey.

This area least resembled the valley bottom areas of Ta Phraya (S = 0.31 and 0.33 for HQ and village areas respectively) and most resembled the Lam Chae area of Thap Lan and upper reaches of the Lam Phraya Than, in Khao Yai (S = 0.66 for both; Table 3). Notwithstanding its evident richness, there were only two species recorded exclusively for this site, again reflecting its similarity with the majority of other sites surveyed. This was the highest-diversity site as measured by three of the four indexes used (Simpson, McIntosh and Berger-Parker, Table 2).

Ta Phraya National Park

53 x 20-species lists were amassed from five distinct sites within the park. Overall, a total of 171 species was found during the survey. This added 54 species to the 150 species listed by Nabhitabhata (1999), an increase of 36%. However, some of the species listed by Nabhitabhata are best regarded as unconfirmed and the present park list is considered to stand at 201 species.

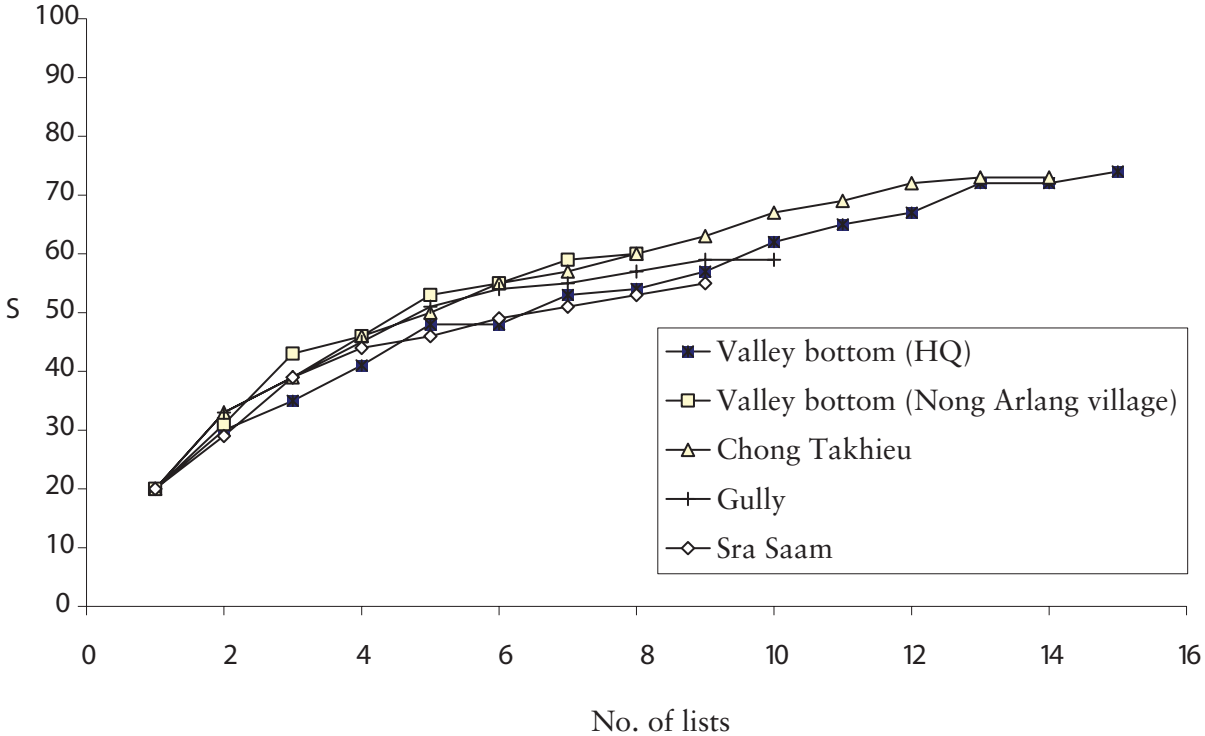
In fact, many other species should be expected since the park was not surveyed in the optimal period for recording non-breeding winter visitors, October to April. In addition, owing to the time of year at which both surveys took place, November 1998 (J. Nabhitabhata, in litt.) and the present survey, in September 1999, many winter visitors had not yet arrived. This should be borne in mind since diversity indexes presented for Ta Phraya (Table 2) will necessarily be lower than for site of comparable richness elsewhere in DPKY which supported a greater range of migrant species since they were surveyed later in the season.

HQ Valley

Open, fire-disturbed semi-evergreen or mixed deciduous forest at c. 120 m elevation, including some plantation areas. The habitat was difficult to classify, but probably originally semi-evergreen with deciduous characteristics accentuated by human use and disturbance, especially through fire.

Because of its proximity to the headquarters, this area was probably less subject to poaching pressure than most others. The chief source of disturbance, vehicles along the access road to the park HQ, is liable to be more significant in its effect in reducing usage by large mammals than it is by birds.

Figure 3. c. Accumulation of bird species with sampling effort at Ta Phraya National Park.



A total of 74 species was recorded on 15 lists (Fig. 3c; Table 2). The predominant species, Spotted Dove (93.3% of lists) reflected the open and disturbed nature of the habitat). Other most common species were Crested Treeswift (80.0%); Black-headed Bulbul (80.0%); Streak-eared Bulbul *Pycnonotus blanfordi*, Stripe-throated Bulbul and White-crested Laughingthrush (66.7%); Lineated Barbet, Black-naped Monarch, Black-collared Myna and Dark-necked Tailorbird (60.0%); Vernal Hanging Parrot and Black-crested Bulbul (53.3%).

The community was therefore composed of a mixture of species characteristic of open habitats and lowland, mainly mixed deciduous, woodland.

The presence of Green Imperial Pigeons was of particular note, given the scarcity of this species elsewhere in DPKY and, indeed, thoughout the country as a whole. Other scarcer species recorded were Blue Magpie and Brown Prinia. The latter species is of particular interest since it is scarce and local, being chiefly found elsewhere in the grassy understorey of dry dipterocarp woodland. Both this species and the scarce Rufous-winged Buzzard, originally inhabitants of dry dipterocarp, appear to be able to survive in fire-damaged evergreen. At least one territory of Rufous-winged Buzzard was present near Km 9.

The site most closely resembled the village (Nong Arlang) area of Ta Phraya, a similar, albeit much more disturbed,valley bottom habitat (S = 0.68); the woodland along the scarp at Chong Takhieu in Ta Phraya; and the KY 3 area of Khao Yai which contained some similar plains, disturbed deciduous or semi-evergreen woodland (Table 3). It least resembled Khao Rom (S = 0.19). There were 6 species recorded exclusively at this site though overall species diversity was unexceptional (Table 2).

Nong Arlang village
An area of small forest patches, and scrub, scattered among rice paddies and temporary houses, at c. 120 m elevation.

Large mammals make frequent use of the upper valley one to two km west of the westernmost houses, since gaur tracks and lying places were seen among grasses in the valley bottom, close to the Lam Saton.

Poaching pressure in the immediate village area was clearly high. An Oriental Pied Hornbill was shot from a flock within a few yards of the surveyors. In spite of being challenged and fired at by forest guards, the villager made his escape without dropping either his gun or his quarry.

Sixty species were recorded on 9 lists. The predominant species were Olive-backed Sunbird *Nectarinia jugularis* (100% of lists); Spotted Dove and Stripe-throated Bulbul (88%); Green Bee-eater *Merops orientalis* and Black-headed Bulbul (75%); Blue-throated Bee-eater *M. viridis*, Black-collared Myna, Streak-eared Bulbul and Common Tailorbird *Orthotomus sutorius* (63%), Pied Bushchat (50%). The bird community could scarcely be described as a forest bird community at all, since open-country species, or those forest birds which adapt well to man-made habitats, comprised seven of the ten most abundant species. Two others, Black-headed and Stripe-throated Bulbuls were forest-edge species. The predominance of Blue-throated Bee-eaters is probably not typical throughout the year, but rather the survey took place at a time of peak passage migration of this species through eastern Thailand.

Table 4. Alphabetical listing of bird species recorded on MacKinnon Lists by site (number of lists per site on which recorded).

	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Abroscopus superciliaris						1						
Accipiter sp.	1	1	2			2						
Accipiter trivirgatus			1									1
Acridotheres grandis								4				
Acridotheres tristis		1										
Acrocephalus aedon								1				
Aegithina lafresnayei	1		7	6	8	6	6	2			8	2
Aegithina tiphia	6	2	1	1	1	2	1	1		15		
Aethpyga saturara									13			
Aethopyga siparaja			3	1	2			5				2
Alcedo meninting				2			1					
Alophoixus pallidus			3	6	8	3	14	1	6		7	5
Amaurornis phoenicurus				1							1	1
Ampeliceps coronatus	2	1				2	1				1	
Anthracoceros albirostris	1	1	1		2		2	1			3	2
Anthreptes singalensis			1	2	1	1	4	1			2	1
Anthus hodgsoni									1			
Anthus rufulus		1										
Arachnothera longirostra						15	14	4	1		2	1
Arborophila chloropus			2	6	5	6	7	3			3	
Ardeola bacchus	2	2	1							1		

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	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Artamus fuscus								1				
Athene brama	1											
Aviceda jerdoni									1			
Bradypterus davidi											1	
Buceros/Aceros									1			
Butastur liventer	2											
Butorides striatus		2	1									1
Cacomantis sonneratii			1		1	2	2				7	
Carpococcys renauldi									1			
Celeus brachyurus	1											
Centropus bengalensis		1								1		
Centropus sinensis	5	2	2	1			1	1		3	3	3
Chalcophaps indica	1	1	1	1	1	1	2		1	1		3
Chloropsis aurifrons	2	2	1			1	1	2		7		
Chloropsis cochinchinensis			3	2	3		2		3		5	2
Chrysococcyx sp.											1	
Chrysocolaptes lucidus		1			1	4	6	1	2	6	7	2
Chrysomma sinense	1							1				
Cissa chinensis					1		2		2			
Copsychus malabaricus	3	3	7	9	7	10	7	6		1	4	
Copsychus saularis	2	2						1		1	1	
Coracias benghalensis	10	6	3	1				1		14		
Coracina macei										19		

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	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Coracina melaschistos						3	7	1	7		5	5
Coracina polioptera										12		
Corvus macrorhynchos		2		1						2		
Crypsirina temia	2	1	1	1		5		4		1	1	
Cuculus micropterus				1								
Culicicapa ceylonensis						4	9	4	1		8	2
Cyornis banyumas									11		1	1
Cyornis hainana			1	4	3	5	10	4			7	3
Cyornis tickelliae						4						
Dendrocitta vagabunda										6		
Dendrocopos canicapillus			1				1	1		14		1
Dendrocopos macei										3		
Dendrocygna javanica	1			1								
Dendronanthus indicus	2	1	3									
Dicaeum agile	2		3	1	3	3		3		1		
Dicaeum cruentatum		1	1					4		7		1
Dicaeum ignipectus									11			
Dicaeum sp.							1					
Dicrurus aeneus	2		8	6	3	3		2	1	5	8	1
Dicrurus hottentottus	3	1		1		3	8	2	9		2	5
Dicrurus leucophaeus					1	7	8	4	12	17	9	7
Dicrurus macrocercus	1											
Dicrurus paradiseus	9	2	7	8	5	4	7	3		4	3	4

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	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Dicrurus remifer												
Dinopium javanense	4		1	3		2	1			10		1
Dryocopus javensis										2		
Ducula aenea	10		3	2			1			1		
Ducula badia									6			
Enicurus leschenaulti									1			
Eudynamys scolopacea	1	3						1				
Eumyias thalassina						3	3	3	1	2	3	4
Eurylaimus javanicus					1		2				2	
Eurystomus orientalis	4	2	6					1				
Ficedula parva						2		2		15	4	5
Francolinus pondicerianus										3		
Gallus gallus	5		3		1	4	1				1	4
Garrulax chinensis									8			
Garrulax leucolophus	10	4	5	8	6	11	3	1			1	1
Garrulax monileger	1					1					1	
Garrulus glandarius										1		
Geopelia striata								1		1		
Glaucidium cuculoides	2		3			1	1	1			3	
Gracula religiosa	7	2	6		6	5	4	1	1	11	8	3
Halcyon pileata		1									1	
Halcyon smyrnensis		1	1	1								
Harpactes erythrocephalus							1		1			

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	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Harpactes oreskios			6	3	1		2			5	5	
Hemicircus canente			1		2	1	1				3	3
Hemipus picatus	3	1	6	3	1	2	1	1	7		7	
Hemiprocne coronata	12	6			1					2	3	
Hemixos flavala									7			
Hypothymis azurea	9	3	6	9	7	7	9	6		2	12	2
Iole propinqua			9	4	4	5	9	2	8		6	4
Irena puella			4	1	7	8	6	1	3		13	2
Lacedo pulchella			1								1	
Lanius collurioides	1	2								12		
Lanius cristatus		3	1									1
Lanius tephronotus									2			
Lanius tigrinus					2							
Locustella lanceolata								3				
Lonchura punctulata		3						1				
Lonchura striata	2		3									
Lophura diardi					1						2	
Lophura nycthemera									3			
Loriculus vernalis	8	4	9	1	8	15	8	4	4	4	11	3
Luscinia calliope								4		1		
Luscinia cyane					2	9	5	9	15	1	10	5
Macronous gularis	2	2	14	6	8	14	14	6	12	1	17	7
Macropygia unchall									2			

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next »

	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Malacocincla abbotti			3	4	3	3	4		3		3	2
Malacopteron cinereum				3	2						2	
Megalaima australis			4	3	2		1	4			3	
Megalaima faiostricta	1		3	2	4	1	4	3			3	1
Megamaima haemacephala	4	3	3			1	1	4		4		
Megalaima incognita							1		8		1	
Megalaima lineata	9	1	1			5		2		9		
Meiglyptes jugularis						1						
Melanochlora sultanea			1		2	3	3				7	
Merops leschenaulti						2		2			4	1
Merops orientalis	2	6										
Merops viridis	7	5	3									
Microhierax caerulescens										2	1	
Mirafra erythrocephala	1											
Monticola solitarius			1							1	1	2
Motacilla alba										1		
Motacilla cinerea	2		4			1				1	1	
Mulleripicus pulverulentus												1
Muscicapa dauurica							1	2		1	2	3
Muscicapa sibirica			1									
Myophonus caeruleus											3	
Nectarinia asiatica										1		
Nectarinia jugularis	7	8	8	1	4	1		1			1	

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	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Nyctyornis athertoni	2	1						1	1			
Oriolus chinensis		2				10	5	1	3	3	4	3
Oriolus xanthornus										6		
Orthotomus atrogularis	9	4	11	6	8	14	11	2	9	1	15	5
Orthotomus sutorius	1	5	1	1	1	2		7		7		2
Pandion haliaetus										1		
Passer flaveolus		2								1		
Pellorneum ruficeps	3	1	7	8	5	3		1	3		6	2
Pericrocotus cantonensis						5	6	2	2	5	4	1
Pericrocotus cinnamomeus										13		
Pericrocotus divaricatus										3		
Pericrocotus flammeus			8	4	3	5	5	1	4	7	5	2
Pericrocotus roseus						2				4		
Pernis ptilorhyncus	1											
Phaenicophaeus tristis	6	2	8	4	5	2	3	7	2	2	4	4
Phylloscopus borealis	3			2	3							
Phylloscopus coronatus							1				1	
Phylloscopus davisoni									10			
Phylloscopus fuscatus											1	
Phylloscopus inornatus						4	11	7	9	13	13	6
Phylloscopus plumbeitarsus						5	8	7		5	8	3
Phylloscopus reguloides									4		5	1
Phylloscopus ricketti							1					

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next »

	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Phylloscopus schwarzi									1	10		3
Phylloscopus tenellipes						12	13	9	7	1	13	6
Picus canus												2
Picus chlorolophus							3			1		
Picus erythropygius										6		
Picus flavinucha				1	2	2	5		2		4	1
Picus vittatus			2	3	1	7	5	1			2	1
Picus xanthopygaeus										2		
Pitta cyanea									1			
Pitta phayrei					2	2	4					
Polihierax insignis										2		
Pomatorhinus hypoleucos	1		9	7	7		1		3		3	
Pomatorhinus schisticeps					1	2	4		8		2	2
Prinia hodgsonii	5	3						2		5	1	
Prinia inornata	1	3										
Prinia polychroa	3	1								13		
Prinia rufescens	2		1					1		14	1	
Psarisomus dalhousiae							1					1
Psittacula alexandri	1					10	8	3		16	2	
Psittacula roseata										15		
Pteruthius aenobarbus									2			
Pteruthius flaviscapis									4			
Pycnonotus atriceps	12	6	8	3	5			5		1	9	

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	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Pycnonotus aurigaster	2									23		
Pycnonotus blanfordi	10	5				2		4		1	1	
Pycnonotus finlaysoni	10	7	10	7	5	10	7	5	2	1	12	3
Pycnonotus melanicterus	8	2	14	9	10	10	8	7	14	3	14	2
Rhipidura aureola										9		
Rhipidura javanica	1							2		1		
Rhyticeros undulatus							2					1
Saxicola caprata	2	4						2		11		
Seicercus soror					1		3	1			2	
Seicercus tephrocephalus									13			2
Serilophus lunatus					3							
Sitta castanea										7		
Sitta frontalis					2		1		2	4	4	
Spilornis cheela			3			1	1			1	1	
Spizaetus cirrhatus			1									
Spizaetus nipalensis			1								1	1
Streptopelia chinensis	14	7	4	1				3		13		1
Streptopelia tranquebarica								1		4		
Sturnia malabarica						3	1					
Sturnus nigricollis	9	5										
Surniculus lugubris						1						
Tachybaptus ruficollis				2								
Tephrodornis gularis					1		1					1

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next »

	Ta Phraya					Khao Yai				Thap Lan		
	HQ valley	Nong Arlang	Chong Takhieu	Sra Saam	gully	LPT valley	LPT upland	KY3	Khao Rom	Sap Sadao	Lam Chae	Lam Praeng
Tephrodornis pondicerianus										7		
Terpsiphone paradisi				1			1				1	1
Treron curvirostra	5		4	3	2	1	3				6	1
Treron ?bincincta								1				
Treron pompadora							2					
Treron ?sphenura									2			
Timalia pileata	4	1								4		
Turdus obscurus										1	2	3
Turnix suscitator		2										
Upupa epops	2									2		
Urocissa erythrochyncha	3											
Urosphena squameiceps									3		2	1
Vanellus indicus	3											
Yuhina zantholeuca			2	1	2		4	2	8		5	
Zoothera citrina												1
Zoothera sibirica		1		6.7	200				1			
Zosterops erythropleurus		1		6.7					5			1
No. of lists	15	8	14	9	10	16	17	11	15	24	20	9

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Oriental Pied Hornbill was nonetheless present, as was Emerald Dove. The only woodpecker recorded was Greater Flameback (12.5%), and Black-crested Bulbul, one of the commonest bulbuls in better quality forest, was only represented on 30.0% of lists.

This site most closely resembled the HQ-valley area of Ta Phraya (S = 0.68) and least resembled the montane forest site, Khao Rom (S = 0.23; Table 3).

Species diversity was lower than many other sites, with the Berger-Parker index at the minimum possible value for the MacKinnon List technique (20.0) (Table 4).

Nonetheless diversity was not much less than that for the HQ-valley area, albeit weighted in favour of scrub and open country species rather than forest species. Two indexes, Simpson, and Mcintosh, gave this area higher diversity than for the HQ-valley area (Table 2).

Chong Takhieu Scarp

Taller forest along the road and along the rim of the scarp at c. 280 m to 400 m elevation, lying to the east of the westernmost of the two roads bisecting the park. The canopy was open in places, with a few grassy clearings indicating former logging and other disturbance (*e.g.*, through fire).

Hunting pressure was reportedly high, due to the presence of army ranger posts in the area. Though no direct signs of hunting were observed during the morning spent in the area with park guards, at least four gunshots were heard from this general direction on a preceding day while the team was working nearby Sa Saam.

A total of 73 species was recorded on 14 lists (Table 2). The predominant species were Black-crested Bulbul and Striped Tit Babbler (100% of lists); Dark-necked Tailorbird (79%); Stripe-throated Bulbul (71%), Vernal Hanging Parrot, Grey-eyed Bulbul and Large Scimitar Babbler (64%), Green-billed Malkoha, Bronzed Drongo, Scarlet Minivet, Black-headed Bulbul and Olive-backed Sunbird (57%); Greater Racket-tailed Drongo, Great Iora, White-rumped Shama and Puff-throated Babbler (50%).

Green Imperial Pigeon and Mountain Hawk Eagle *Spizaetus nipalensis* were among the scarcer species recorded in this area, and overall the site appeared likely to support a good range of forest birds.

This site most closely resembled its geographically closest neighbour, Sa Saam (S = 0.69), and the Lam Phraya Than upland area of Khao Yai, which supported similar, tall semi-evergreen forest (S = 0.67). It was most dissimilar to Khao Rom, Khao Yai (S =0.28) and Sap Sadao, Thap Lan (S = 0.38; Table 3). Three species were recorded exclusively at this site. Species diversity was about equal to that of the HQ-valley area (Table 2).

Sa Saam

Much of the area was dominated by scrubby, low stature secondary evergeen forest, and scrub roughly 10-20 m high with a few scattered larger trees remaining, but with no continuous canopy anywhere. There were very few rattans in the understorey and no bamboo. Some *Licuala* palms were present along the banks of streams.

The elevation was chiefly around 300 m, and the topography flat or gently undulating. At the time of the survey the area was wet and swampy underfoot, and transected by occasional small streams. A number of small waterbodies were present towards the eastern margin of the area. These were fringed with some taller denser trees and supported both floating and emergent aquatic vegetation.

A well-used trail passed through the area and was littered with instant noodle packets, articles of clothing and other impedimenta, suggesting use by people other than forest product collectors and hunters. These were thought to be possibly immigrant workers from Cambodia. There were many large stumps of *Afzelia* which were now coppicing. These post-dated the era of legal logging concessions and were indicative of more recent poaching. Newer (one to two year-old) signs of logging were also found.

New rubber tyre tracks from a hand-barrow appeared overnight on 11–12 September, in the eastern part of the area, possibly occasioned by a large mammal carcass being wheeled out of the forest.

A total of 55 species was recorded on 9 lists (Table 2). The predominant species were Black-naped Monarch, White-rumped Shama and Black-crested Bulbul (100% of lists); Greater Racket-tailed Drongo, White-crested Laughingthrush and Puff-throated Babbler (89%); Stripe-throated Bulbul and Large Scimitar Babbler (78%); Scaly-breasted Partridge, Bronzed Drongo, Great Iora, Puff-throated Bulbul, Dark-necked Tailorbird and Striped Tit Babbler (67%).

The presence of small waterbodies around this site held out the hope that some scarcer waterbirds might be present. However, there was probably too much human disturbance to enable the more sensitive species to persist, even though small numbers of Green Imperial Pigeons, a forest species susceptible to hunting, were present.

Sa Saam was most similar to its geographically closest neighbours, the Gully area west of park headquarters (S = 0.70) and to the Chong Takhieu scarp (S= 0.69), and least similar to the dry dipterocarp forest of Sap Sadao, Thap Lan National Park (Table 3). There were two species, White-breasted Waterhen *Amaurornis phoenicurus* and Little Grebe *Tachybaptus ruficollis*, recorded exclusively at Sa Saam due to the presence of the ponds there. Species diversity was low as measured by the whole range of indexes (Table 2).

Gully area west of headquarters

This was an area of moist forest along a small stream gully on the scarp, c. 5 km west of headquarters at mostly 300-400m elevation. There were taller trees along the gully itself and on the scarp slopes, but both on the plateau (c. 500 m) and at the foot of the scarp (c. 200 m), the forest was lower stature, dry and thorny, probably secondary or logged, but with dense understorey and middle storey.

Old fires and hunters' camps were found at four places, with remains of three shot or snared Siamese Firebacks at one of these.

Sixty species were recorded, on 10 lists (Table 2). The most frequent species found were Black-crested Bulbul (100% of lists), Vernal Hanging Parrot, Great Iora, Dark-necked

Tailorbird and Striped Tit Babbler (80%), Black-naped Monarch, Asian Fairy Bluebird, White-rumped Shama, Puff-throated Bulbul and Large Scimitar Babbler (70%), Hill Myna and White-crested Laughingthrush (60%),Scaly-breasted Partridge, Green-billed Malkoha, Greater Racket-tailed Drongo, Black-headed Bulbul, Stripe-throated Bulbul and Puff-throated Babbler (50%).

The high representation of frugivores such as Vernal Hanging Parrot, Asian Fairy Bluebird, and Hill Myna was indicative of fairly good quality forest. Oriental Pied Hornbill was present.

The area most closely resembled Sa Saam (S = 0.70); the Upper Lam Phraya Than area of Khao Yai (S = 0.67); the Chong Takhieu Scarp of Ta Phraya and Lam Chae,Thap Lan (both S = 0.65) and the lower Lam Phraya Than (S = 0.62; Table 3). Two species were recorded exclusively here, but overall diversity was unexceptional (Table 2).

Other areas in/near Ta Phraya
Significant areas of lowland open dry dipterocarp woodland, scattered among rice paddy, were present outside (south of) the park boundary around the Chong Takhieu Guard Station, and stretched uninterrupted eastwards to the Cambodian border.

Although the area was farmed, population density was low and there was a high percentage of woody cover. Two Rufous-winged Buzzards were seen, together with Rufous Treepies *Dendrocitta vagabunda*, Burmese Shrikes and other species characteristic of open dry dipterocarp woodland. Since some of these species were scarce in the more closed forest and hilly areas inside the park, these "buffer areas" have significant value for birds.

Comparison among sites
The most distinctively different forest sites surveyed were the dry dipterocarp forest at Sap Sadao (similarity index of 0.26-0.52 compared to the other sites) and the montane forest at Khao Rom (similarity index of 0.19-0.53 compared to the other sites).

The similarity index and diversity indexes for sites in Ta Phraya were slightly depressed in relation to sites in the other two parks, because the surveys took place at a different time of year. Both Thap Lan and Khao Yai were surveyed in November-December when they would have a virtually full complement of migratory species. Ta Phraya was surveyed in September, when many winter visitors had not year arrived, and when a few others which are spring and autumn passage migrants and which are not normally present in midwinter (*e.g.*, Blue-throated Bee-eater and Tiger Shrike *Lanius tigrinus*) were passing through.

At the level of DPKY as a whole Khao Yai, with its greater range of elevations, might be expected to support more species than any other site. Yet Khao Yai has few significant areas of deciduous forest, and appears to lack dry dipterocarp forest altogether. It is ironic that no sampling of the avifauna through use of MacKinnon Lists has ever been attempted in the headquarters area of Khao Yai (c. 700–800 m elevation), otherwise the best-known area of the park, as a benchmark. It would be instructive to compare diversity of the headquarters area with other zones already covered. Quite possibly, in view of its higher elevation, it would appear closer to Khao Rom than to any other site covered.

The abundance of some species may change with progression eastwards or westwards along the Phanom Dongrak range. Scaly-crowned Babbler *Malacopteron cinereum* which, in the context of Continental Thailand, has an Indochinese distribution, appeared commoner in Ta Phraya than it was further west in Thap Lan, or in Khao Yai (where, though known to be present, it was not recorded). The apparent absence of Little Spiderhunter, a common understorey species often associated with bananas, *Musa* spp., from Ta Phraya was notable, especially since it was so common further west. Though it is listed for Ta Phraya by Nabhitabhata, (unpubl.), it was not found in Phu Jong Na Yoi (Ling, *et al.*, 1999) nor by Round (1998), further east again, in Dong Khanthung, at the south-western extremity of Lao PDR.

Not all of the variation among sites could be easily explained. At three sites in Ta Phraya a much higher frequency of Large Scimitar Babbler was found than at any of the other nine sites surveyed. The only other site where the encounter frequency was similarly high appeared very different in most other respects, since it was the montane site, Khao Rom. Subtle microhabitat differences and similarities among sites, not evident from a rapid survey, may be responsible for the absence or persistence of a particular species. Some species may have inexplicably patchy distributions linked to other factors.

Key species accounts

The following section provides detailed accounts for "Key Species" (*i.e.*, those of conservation concern).

Assessment of the conservation status of birds requires frequent update as more information becomes available. Some of the species listed as threatened or near-threatened by Collar *et al.* (1994) used as the basis for this compilation, were down-graded (from vulnerable to near-threatened, or from near-threatened to unlisted), in the Asian Bird Red Data Book (BirdLife International 2001), due to improved knowledge of their status.

Siamese Fireback *Lophura diardi*

World Range	Endemic to Indochina, NW, NE and SE Thailand (King *et al.*, 1975).
Thai Range	North-eastern and south-eastern Thailand, and northern Thailand east of the Khun Tan range. It is presently known from at least 14 parks and sanctuaries (MASS database). Found in both mature and logged forest, and older secondary growth, from plains up to at least 800 m elevation.
Conservation Status	• IUCN Vulnerable (Collar *et al.*, 1994) or near-threatened (BirdLife International, 2001). Duckworth *et al.* (1999) • At Risk in Thailand: vulnerable (Round, 2000) • Potentially at Risk in Lao PDR (Duckworth *et al.* 1999)
Khao Yai	A habituated group of at least 13 birds was seen on several occasions during winter 1999/2000 along the Khao Khieo road at c. 800 m elevation. One or more birds were seen at a second site, < 1 km distant Feathers of a female were found at an aloewood cutters' camp in the Lam Phraya Than drainage, 17 November, and a male tail feather nearby.

Sakaerat	Present and reasonably frequent in small numbers.
Thap Lan	A group of at least 7, including 6 males, on the banks of the Lam Chae on 18 December. Heard near the headwaters of the Huai Rang, 5 km south of Sap Sadao Guardstation, 20 December.
Ta Phraya	Groups of 2–4 birds were seen on forest of the scarp close to headquarters on 9 September and 15 September. Shed feathers at two locations c. 5 km west of HQ on 15–16 September. Remains of 3 shot birds were found in the same area. Shed feathers were found in the Sa Saam area daily on 10–12 September

Because of the great extent of suitable habitat, DPKY probably supports the largest population of this species anywhere in the country. It appeared to be relatively frequent in the areas surveyed, as revealed by sightings and signs (shed feathers) in spite of the fact that it suffers from hunting through shooting and probably also snaring.

There were very few records of Siamese Fireback from Khao Yai before 1985, but the species has been recorded frequently around the headquarters area of the park over the last fifteen years suggesting it may have become locally more abundant. This zone, 700 m to 800 m elevation, seems to be at the ecotone between upper submontane/montane transition forest and lower submontane forest. Siamese Fireback would be more characteristic of the latter habitat, and Silver Pheasant *L. nycthemera* of the former. Both species are now found frequently in the same areas. An analysis of past records of both species in the park is currently in progress (Round and Gale, in prep.).

Green Peafowl *Pavo muticus*

World Range	NE India, SW China and throughout much of SE Asia, with a disjunct population on Java, Indonesia (King *et al.*, 1975).
Thai Range	Formerly widespread in lowland areas throughout the country, but has suffered a massive range contraction with the spread of cultivation and human settlement. Favours open woodland, close to water bodies, (streams or ponds). Known from possibly five discrete areas, of which the most important is Huai Kha Khaeng Wildlife Sanctuary, western Thailand. The other three areas are in the north and support much smaller populations.
Conservation Status	• IUCN Vulnerable • Endangered In Thailand (Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999) • CITES Appendix II
Thap Lan	Not recorded during the survey. However, a park official, Mr. Pornchai Visutatharn, reported having seen a single peafowl run across the road in dry dipterocarp forest near the Taling Chan Guard Station in the year preceding the survey.
Pang Sida	Three birds seen "in dry evergreen secondary growth behind the park headquarters", 22 February 1994 . (A Mauric, *in litt*).
Ta Phraya	Not recorded during the survey, but park staff claim to have seen three birds around the Km 9 area of the headquarters access road.

These records are considered acceptable. The presence of a small population, perhaps reduced to near vanishing point by hunting, is perfectly plausible given the condition of the open forest habitat at Thap Lan and Ta Phraya. No evaluation can be made of the peafowl sighting at Pang Sida without more information, although the likelihood is that these birds were released captives. In December 1993 A. Mauric also showed the author an elongate secondary from a Great Argus *Argusianus argus* recovered in the park, suggesting release of captives of other Phasianidae.

[**White-winged Duck** *Cairina scutulata*]

World Range From NE India throughout much of SE Asia (excluding Malaysia) to Sumatra (and historically Java BirdLife International, 2001), though now reduced to scattered populations.

Thai Range Formerly widespread and even locally common but presently restricted to three forest complexes in Thailand: in the west, Thung Yai-Huai Khaeng and adjacent areas; the north-east (Phu Khieo-Nam Nao) and along the eastern Phanom Dongrak range, centred on Yot Dom and Phu Jong Na Yoi (Parr *et al.*, 1993).

Conservation Status
- IUCN Endangered
- At Risk in Thailand: status critical (Round, 2000)
- At Risk in Lao PDR (Duckworth *et al.*, 1999)
- CITES Appendix I

The known world population has been estimated at a minimum of only 336 (Green, 1993) to 450 individuals (Rose and Scott, 1997). Estimates of the Thai population range from a minimum of 27 birds (Green, 1993) to a possible maximum of 106 birds (Parr *et al.*, 1993).

Khao Yai One reported in flight over the pond by the former TAT, on 26 January 1989; Petri Hottola, *in litt.*) . However in spite of the presence of significant and apparently suitable water bodies on the plateau area around the headquarters, there are neither any historical records nor any subsequent record. Although a detailed sketch of the bird was provided by the observer, this sighting is regarded as unconfirmed.

The species was not known to local people in either Thap Lan or Ta Phraya in spite of the presence of apparently suitable forest pools still-water reaches on major streams This species has been reduced to near extinction by a combination of hunting and intensive human use of its lowland floodplain habitat. The few remaining birds are confined to upland, forested areas which still possess still-water bodies. Parts of DPKY seem eminently suitable for White-winged Ducks, but if still present, it must be close to vanishing point due to hunting pressure. In the complex of parks and sanctuaries along the Cambodian border, estimated by Parr *et al.* (1993) to hold possibly as many as 64 birds, no fewer than 32 birds were killed or captured in or around these 'protected' areas in the decade or so preceding the survey.

[**Comb Duck** *Sarkidiornis melanotos*]

World Range South America, Africa, India and SE China. In SE Asia recorded from Myanmar, Cambodia, Cochinchina and Central Lao PDR, where known from a single record (King, *et al.*, 1975; Duckworth *et al.*, 1999).

Thai Range Historically recorded from the north and central region (Deignan, 1963), the only post-1980 records are from a few sites in the north-east and the central plains (Lekagul and Round, 1991). Although the species may be presumed to have once bred, all recent records appears to involve non-breeding visitors.

Conservation Status
- At Risk in Thailand: endangered (Round, 2000).
- At Risk in Lao PDR (Duckworth *et al.*, 1999)

The S and SE Asian population is estimated at only 6000 birds (Rose and Scott, 1997).

Ta Phraya Listed by J. Nabhitabhata (*in litt.*) based on an unconfirmed local report of two birds seen in flight near the entrance road to park headquarters in September 1998.

A Border Patrol Policeman interviewed during the present survey saw a bird he thought was a duck in flight at Km3 within the year previously. This might coincide with the sighting above, but the details reported are clearly insufficient to justify adding Comb Duck to the Ta Phraya faunal list. The species is therefore treated as possible, but unconfirmed.

The species is a non-breeding visitor to Sanambin Non-Hunting Area, Prakhonchai District, Buriram (Jintanugool and Round, 1989) from a presumed Cambodian breeding population. PDR visited Sanambin in April 2000 and was told that numbers of Comb Ducks visiting annually had declined from >10 to three or fewer in recent years.

Rufous-bellied Woodpecker *Dendrocopos hyperythrus*

World Range A broad swathe of Asia from the Himalayas, north and east to Heilongjiang, NE China. In SE Asia from Myanmar to Lao PDR, Thailand, Vietnam (King *et al.*, 1975), and Cambodia (Duckworth *et al.*, 1999).

Thai Range The north-west in Chiang Mai, Mae Hongson and Lampang Provinces, and a small area of the north-east (Ubon Ratchathani Province: Lekagul and Round, 1991). Also apparently present in the margins of Huai Kha Khaeng Wildlife Sanctuary, Uthai Thani Province (data held on file at Center for Conservation Biology). It has disappeared from many former localities due to loss or degradation of its habitat.

Conservation Status
- At Risk in Thailand: vulnerable (Round, 2000)

Thap Lan One male at Sap Sadao (sight record, Suwanna Mukachornphan *et al.*, 30 September 2000) is the only record.

This is a very scarce and local species which is restricted to better quality dry dipterocarp woodland and the total population is believed to be very small.

White-bellied Woodpecker *Dryocopus javensis*

World Range Shows a highly disjunct range from W India to China and Korea, through SE Asia to the Philippines and the Sundas (King *et al.*, 1975).

Thai Range Formerly the northern and eastern plateaus, and along the western margin southwards to the peninsula, at low elevations (Lekagul and Round, 1991). Continental subspecies *feddeni* is found in dry

dipterocarp and mixed deciduous forests of plains and foothills to c. 600 m elevation. The peninsular subspecies, *javanicus*, which inhabits rainforest but is similarly restricted to extreme lowlands, is probably close to being extirpated in Thailand. The species is at present known from 16 parks and sanctuaries (data held on file at CCB, Mahidol University).

Conservation Status
- At Risk in Thailand: vulnerable (Round, 2000)
- Potentially at Risk in Lao PDR (Duckworth *et al.*, 1999)

Khao Yai Not recorded during the survey and known from a single record near the northern park viewpoint on 24 October 1970 (H.E. McClure, unpublished notes), and mentioned as either "rare in the park or a straggler from some other habitat" in McClure (1974) presumably on the strength of this record. There are no subsequent observations from the park which appears to lack the core lowland deciduous woodland habitat of this species.

Sakaerat Present, though scarce, in dry dipterocarp woodland. It is unlikely that the c. 12 sq. km of dry dipterocarp woodland in the reserve could support more than 3–4 pairs at most.

Thap Lan A single bird in dry dipterocarp woodland near Sap Sadao Guard Station on 15 December; two on 16 December.

The fragmented area of plains and foothills dry dipterocarp forest extending from Sakaerat to the northern margin of Thap Lan is likely to be of national significance for this nationally rare species.

Streak-throated Woodpecker *Picus xanthopygaeus*

World Range Himalayas and India to SW China, Myanmar, SW, NW and NE Thailand, S Lao PDR, Cambodia and Cochinchina (King *et al.*, 1975; Lekagul & Round, 1991).

Thai Range Sparsely recorded from the north (Chiang Mai) and west from Kanchanaburi to Prachuap Khiri Khan (Deignan, 1963) and from the lower north-east (see below).

Conservation Status
- At Risk in Thailand: vulnerable (Round, 2000).
- Potentially at Risk in Lao PDR (Duckworth *et al.*, 1999)

Though not considered globally threatened, there are very few Thai records.

Sakaerat Known from a single specimen, sexed as male, collected on 8 August 1973 (National Reference Collection).

Thap Lan A male was seen in dry dipterocarp woodland near the Sap Sadao Guard Station on 16 December and again on 21 December.

Pang Sida A sight record, 3 August 1993 (K. Wichapant and S. Ngowattana, *in litt.*) is best regarded as unconfirmed.

Throughout its Thai and Indochinese range, it appears to be restricted to the better quality, more diverse dry dipterocarp woodland of plains and foothills. This species is evidently scarce and local both in Thailand (Round, 1988; Lekagul and Round, 1991) and in Lao PDR (Duckworth *et al.*, 1999). J.W. Duckworth (pers.comm.) found it relatively frequently in the best quality lowland dry dipterocarp in Dak Lak province, Vietnam.

Black-headed Woodpecker *Picus erythropygius*

World Range	Restricted to Myanmar, Thailand, Lao PDR and Vietnam (King *et al.* 1975).
Thai Range	Found in deciduous forests of lowlands and lower hills, formerly occurring throughout the northern and eastern plateaus, and the western provinces south as far as Kanchanaburi. It is currently known from around 20 parks and sanctuaries (Data held on file at CCB, Mahidol University).
Conservation Status	• Not listed as threatened in Thailand, though probably on the border of being near-threatened since it is restricted to deciduous woodlands of the plains and foothills. • The species is not considered at risk in Lao PDR (Duckworth *et al.*, 1999) because so much low altitude deciduous forest persists.
Sakaerat	Present in dry dipterocarp forest.
Thap Lan	Present only in dry dipterocarp habitat around Sap Sadao Guard Station, where recorded on three days, with a maximum of 10 individuals.

This species was not found in Ta Phraya. Though listed for Khao Yai by Flotow (1980) and also reported to PDR in January 1992, it is not thought to occur in the park, which lacks suitable areas of its core, deciduous forest, habitat and these records are therefore treated as unconfirmed.

Great Slaty Woodpecker *Mulleripicus pulverulentus*

World Range	N India to SW China; throughout SE Asia to Greater Sundas and Palawan (King *et al.*, 1975).
Thai Range	Formerly throughout except for the Central Plains
Conservation Status	• At Risk in Thailand : near-threatened (Round, 2000) Not considered to be at risk in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	Not found in areas of apparently suitable habitat during the current survey along the Lam Phraya Than and elsewhere. Scarce, though frequently seen around the headquarters area, in groups of up to 5 or 6 birds.
Sakaerat	Listed by TISTR (2000) and said to be "extremely scarce".
Thap Lan	One or more heard, near the Lam Praeng Substation, 23 December 1999.
Pang Sida	Listed by A. Mauric (*in litt.*).

This species was much scarcer than anticipated. It seems to occur at naturally low density, favouring the largest trees. There are no recent records from Sakaerat, and the species was not recorded from Ta Phraya

Oriental Pied Hornbill *Anthracoceros albirostris*

World Range	North and East India, W China and throughout SE Asia to the Greater Sundas (King *et al.*, 1975)
Thai Range	Formerly widespread throughout (Deignan, 1963), but now absent from most of the north. In the north-east is now almost totally confined to nature reserves.

Conservation Status	• At Risk in Thailand: near-threatened (Round, 2000) Still widespread and locally numerous in Lao PDR where not considered to be at risk (Duckworth, *et al.*, 1999).
Khao Yai	Though still common in the headquarters area of the park, it was not encountered on Khao Rom. Heard near KY3 guardstation, UTM 842998, 12 November. Heard (probably two or more birds) near UTM 986877, south of Ban Khlong Sai, and on the upper Lamp Phraya Than, near camp UTM 991486. None thereafter on Khao Khat and Lower Lam Phraya Than
Sakaerat	Present, though relatively scarce (TISTR, 2000).
Thap Lan	Uncommon; Up to 4 present near Camp 2 (UTM 956816),18–19 December, on the Lam Chae; heard also near Sap Pet, 19–21 December. Two near Lam Praeng GS, 23 December.
Ta Phraya	Heard near park HQ, 9 and 10 September; two near the scarp, Chong Takhieu, 13 September. Remains found at a hunters' camp, c. 5 km W of the park headquarters, 16 September. A party of birds heard, and two more seen in the same general area, 16–17 September. One individual from a flock of c. 7 birds was shot by a village hunter as he was being stalked by park guards on 18 September. The hunter escaped with his quarry.

This species, which should be common, was generally scarce in optimal habitat throughout DPKY, presumably having been much reduced in numbers through hunting.

Great Hornbill *Buceros bicornis*

World Range	India to SW China, through SE Asia to Sumatra (King et al., 1975).
Thai Range	Widespread throughout the whole country, though extirpated, even from protected areas, in many parts of the north, and reduced elsewhere. It is currently known from at least 47 protected areas in Thailand (Data held on file at CCB, Mahidol University).
Conservation Status	• At Risk in Thailand: (Round, 2000) • At Risk in Lao PDR (Thewlis, *et al.*, 1998) • CITES Appendix I
Khao Yai	Widespread and frequent in the western third of the park including the headquarters (Trisurat *et al.* 1996). Wing noise heard on three days on Khao Rom was either this species or *Aceros undulatus*. Neither seen nor heard anywhere in the eastern part of the park.
Thap Lan	Not found during the present survey, though present in the park (Pornchai Wisutatharn).
Pang Sida	Listed by Alain Mauric (*in litt.*)
Ta Phraya	Listed by J. Nabhitabahata (*in litt.*). Not recorded during the current survey, though wing-noise heard up the scarp from park HQ was either this species or *Aceros undulatus*.

This species is highly dependent on larger-fruited figs. The average breeding season home range of radio-tagged males in Khao Yai was 3.7 km^2 (Poonswad and Tsuji, 1994). The same authors calculated that a minimum area of 1,859 km^2 would be necessary to sustain a

population of 500 Great Hornbills. Poonswad *et al.* (1987) estimated the density of Great Hornbills as 0.7 nests per km^2 for 26 km^2 of mature forest around Khao Yai headquarters. The species is apparently absent from Sakaerat, though assumed to have formerly been present.

Brown Hornbill *Anorrhinus tickelli*

World Range	India to SW China, Tenasserim, N and W Thailand, Lao PDR, N and central Vietnam (King *et al.*, 1975).
Thai Range	Race *A.t. tickelli* is found in the west from c. 13 deg N in Phetchaburi, north to Huai Kha Khaeng (Uthai Thani) and southern Tak (Umphang District). *A.t. austeni* was formerly present in NW Thailand, from northern Tak Province northwards, and along the Dong Phaya Fai Range from Loei Province southwards to Khao Yai (Deignan, 1963; data held on file at CCB, Mahidol University). It ascends the hills to a little above the montane ecotone, but is range is centred on submontane forests. Both subspecies combined are currently known from 15 protected areas.
Conservation Status	• UCN near-threatened (Collar *et al.*, 1994) • At Risk in Thailand • Potentially at Risk in Lao PDR (Duckworth *et al.*, 1999) • CITES Appendix II
Khao Yai	Present in the headquarters area of the park. At least two seen off the southern scarp of the Khao Khieo-Khao Rom massif, 12 February 2000. None found in the Lam Phraya Than drainage or elsewhere around the northern and eastern park margins.
Thap Lan	Not recorded during the survey. The sole record for the park is of a flock of 20 seen at UTM 043768 on 14 October 1999 by Pramual Mahan, a park ranger. This seems to be the easternmost sighting of the species in the Phanom Dongrak range.

The distribution of this evergreen forest species is unusual in that does not extend eastwards along the Phanom Dongak range beyond Thap Lan: It has not been recorded from Pang Sida or from Sakaerat, and may be naturally scarce east of the Khao Yai headquarters area. Nor is it found in the moist evergreen forest and montane outlier, Khao Soi Dao, in Chanthaburi Province. The pattern of records from Khao Yai is also anomalous: McClure (1974) thought it was a straggler from the north and mentioned it had been seldom seen. Either it was overlooked, or it has become naturally more common in recent years (which seems unlikely). The breeding season home ranges of two radio-tagged Brown Hornbills in Khao Yai were 5.9 and 4.3 km^2 (Poonswad and Tsuji, 1994).

Wreathed Hornbill *Aceros undulatus*

World Range	E India to SW China, and throughout most of SE Asia to the Greater Sundas (King *et al.*, 1975).
Thai Range	Found throughout most parts of the country supporting evergreen forest, including the NW part of the eastern plateau, and the south-eastern provinces, and throughout the west and the peninsula. Now extirpated from most of the NW, including 35 protected areas, and scarce throughout much of the south.

Conservation Status	• At Risk in Thailand: near-threatened (Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	The only region of the park in which this species is moderately common appears to be around the headquarters where a roost of several hundred birds is present post-breeding season. Wing noise of this species or Great Hornbill was heard on Khao Rom, 7–9 November. Along the Lam Phraya Than Drainage two heard calling, UTM 991846, 17 November; pair seen in flight at UTM 006842, and a third bird heard, 18 November 1999.
Pang Sida	Listed by Alain Mauric (*in litt.*).
Ta Phraya	Wing noise, either this species or Great Hornbill, was heard on the scarp N of park headquarters, 9 September.

Apparently absent from Sakaerat, and evidently scarce throughout most of the area (other than the Khao Yai headquarters area), presumably having been reduced by hunting. The home range of a radio-tagged male Wreathed Hornbill in Khao Yai was larger than other species studied, c. 10 km^2 (Poonswad and Tsuji, 1994). Poonswad et al. (1987) estimated 0.38 nests per km^2 for 26 km^2 of mature forest around Khao Yai headquarters.

Coral-billed Ground Cuckoo *Carpococcyx renauldi*

World Range	Found only in NW, NE and SE Thailand, Lao PDR, Cambodia and Vietnam (King *et al.*,1975; Duckworth *et al.*, 1999).
Thai Range	Similar to that of Siamese Fireback in that it is chiefly found in evergreen forests of the eastern part of the country, including the northern region east of the Khun Tan Range. Presently known from at least 6 protected areas (Data held on file at CCB, Mahidol University).
Conservation Status	• IUCN Near-threatened (Collar *et al.*, 1994) though not listed by BirdLife (2001). • At Risk in Thailand: vulnerable (Round, 2000). Duckworth *et al.* (1999) do not consider this species to be at risk in Lao PDR.
Khao Yai	The species is widespread and frequent around the headquarters area of the park, where birds were observed at three locations in February and April 2000. One was heard calling at 1300 m, just on the south side of the summit ridge of Khao Rom on 9 November. This is an unusually high elevation record for the species. However, the southern face of Khao Rom slopes gently up from moderate elevations, so the lowland and submontane flora and fauna may not attenuate so acutely with elevation as it might on a steeper slope.
Sakaerat	Listed by TISTR (2000).
Pang Sida	Seen by S. Henson on the Pa Kieu Waterfall trail, July 1993 (A. Mauric, *in litt.*)
Ta Phraya	Listed by J. Nabhitabhata (*in litt.*)

The species may be presumed to be present in Thap Lan. However, it remained unrecorded owing to much reduced calling (and therefore lowered detectability) at the time of year at which the survey took place.

Blossom-headed Parakeet *Psittacula roseata*

World Range	NE India to S China and throughout continental SE Asia (King *et al.*, 1975).
Thai Range	Sparsely throughout continental Thailand, including the central plains, south to Prachuap Khiri Khan (Lekagul and Round, 1991). It is known from 15 protected areas (data held on file, CCB, Mahidol University).
Conservation status	Not listed as threatened, though in view of the massive decline in numbers nationwide, its status needs to be closely monitored and considered for listing at the next review.
Khao Yai	Not recorded during the present survey. There are occasional records of one or two birds from the fire protection station/viewpoint area, at the northern margin of the Khao Yai scarp, or near the park gate, usually associated with Red-breasted Parakeets.
Sakaerat	Present, though scarce: one nest record (source not traced)
Thap Lan	Abundant in the plains dry dipterocarp woodland at Sap Sadao and recorded on 63 % of lists. The maximum number seen in any one day was 35 individuals.
Pang Sida	Recorded July 1993 by S. Henson (A. Mauric, *in litt.*).

Sap Sadao area of Thap Lan was clearly an important site for this species. Blossom-headed Parakeet seems to be more restricted to deciduous forest types than does Red-breasted Parakeet, since none were found among Red-breasted Parakeets in the semi-evergreen forest in the eastern lowlands of Khao Yai. It was not clear whether the population at Sap Sadao was subject to collection of nestlings for sale as pets.

Red-breasted Parakeet *Psittacula alexandri*

World Range	N and NE India to SW China; SE Asia, including some parts of the Thai-Malay peninsula, and patchily in the Greater Sundas (King *et al.*, 1975)
Thai Range	Throughout the country (though scarce and patchy in the peninsula). Naturalised populations also occur in Bangkok and elsewhere in the S Central Plains. The species has declined massively since Deignan (1945) recorded a flock that comprised as many as 10,000 individuals and the species has been extirpated from many areas within its historical range. It is currently known from 25 protected areas in Thailand.
Conservation Status	Not listed as threatened, but its status needs monitoring since it has declined enormously and will probably suffer further from intensification of agriculture, causing loss of nesting and roosting trees, and the continued cagebird trade.
Khao Yai	Found commonly around the northern and eastern park margins, at KY3, and both the upper and lower Lam Phraya Than (one-third to two-thirds of all lists: maximum daily total 100 birds). According to villagers, flocks raid cornfields. It is much less common around the headquarters area of the park, most records coming from the deciduous/evergreen forest ecotone near the firestation viewpoint, and the northern park gate, where a few stands of *Lagerstroemia calyculata* trees in the valley provide suitable nesting and roosting

	habitat. Numbers have declined in the past decade due to loss of nest trees along the Thanarat Road. Construction of a new subdistrict administrative office in 2001 decimated the largest stand of *Lagerstroemia* nest-trees outside the northern park gate.
Sakaerat	Present and reasonably frequent.
Thap Lan	Found on fully two-thirds of lists at Sap Sadao, with up to 20 birds recorded daily. Small numbers present along the Lam Chae.
Pang Sida	Listed by Alain Mauric (*in litt.*).
Ta Phraya	Scarce: two in open woodland near park HQ, 10 September and 14 September.

In view of the scarcity of this species around the headquarters area of Khao Yai, the eastern part of the park is clearly a major stronghold for the species at the national level.

Spot-bellied Eagle Owl *Bubo nipalensis*

World Range	India to SW China, Myanmar, continental Thailand and Indochina (King *et. al.*, 1975).
Thai Range	Known from the north and west, south to Prachuap Khiri Khan. In wooded parts of the north-east, mainly along the Dong Phaya Fai range, and in Khao Soi Dao (South-east). Probably scarce, naturally occurring at low density and limited to areas with large trees, across a wide altitudinal range, from plains of foothills to the montane zone (c. 1300 m; Deignan, 1945) and apparently heard once at c. 1600 m (author's own observations). It is known from at least 9 protected areas.
Conservation Status	• IUCN Near-threatened • At Risk in Thailand • Potentially At Risk in Lao PDR (Duckworth *et al.*, 1999) • CITES Appendix I
Khao Yai	Present, though scarce, and occurring at low density, around the headquarters area of the park. Not recorded during the current survey.
Pang Sida	Recorded, Km. 17, August 1993 by S. Henson (A. Mauric *in litt.*).

Like many larger owls Spot-bellied Eagle Owl may be under-recorded due to difficulties of detection.

Javan Frogmouth *Batrachostomus javensis*

World Range	Eastern Myanmar, Thailand, Lao PDR, extreme southern Vietnam, Malaysia, the Greater Sundas and Philippines (Robson, 2000; Sibley and Monroe, 1990).
Thai Range	Inhabits lower elevation evergreen and mixed deciduous forest in the north, north-east, south-east, west and the peninsula. Birds throughout most of the country are of the race *B.j. continentalis* and those from the extreme south (Yala and Narathiwat) are *B.j. affinis*, sometimes treated as a distinct species, Blyth's Frogmouth *B. affinis*. Sibley and Monroe (1990) treat all continental SE Asian populations as *B. affinis*, reserving *B. javensis* only for the Javanese birds. Marshall (1978) treated eastern Thai birds, including those in DPKY, together

	with those in the extreme south and in Malaysia as *B.j. affinis*, while treating birds from north, west and the remainder of peninsular Thailand as *B.j. continentalis*.
Conservation status	• At Risk in Thailand (Vulnerable; Round, 2000). Much reduced due to clearance of lowland forest, to which it is largely restricted. Seemingly scarce and patchy in in continental Thailand. Formerly widespread, and seemingly more common in the peninsula, in both mature forest and secondary growth.
Khao Yai	Not recorded during the current survey. At least three territories have been found within 10 km of the park headquarters since c. 1982. This is an unusually high elevation for the species and its occurrence there may be linked with the biophysical attributes of forest on plateau country. Marshall (1978) obtained a series from Khao I- Phrom, in the eastern part of Khao Yai, presumably along the highway between Kabinburi and Nakhon Ratchasima, at or near where it crosses the watershed.
Sakaerat	Listed for the site on the MASS database (CCB, Mahidol University). The authority is currently not traceable.

This species should be present, though scarce, throughout DPKY.

Pale-capped Pigeon *Columba punicea*

World Range	E and NE India to S China; continental SE Asia and peninsular Thailand (King *et al.*, 1975)
Thai Range	W, NE, SE and peninsular Thailand, including islands off the Andaman coast. Non-breeding visitor to the peninsula; status uncertain elsewhere but possibly resident at some localities. There are historical or contemporary records from 6 protected areas other than Khao Yai (data held on file, Center for Conservation Biology, Mahidol University).
Conservation Status	• IUCN Vulnerable • At Risk in Thailand: vulnerable (Round, 2000) • Little-known in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	Not recorded during the current survey. Listed from the headquarters area 7–8 March 1981 by W.E. Fletcher (*in litt.*). Two seen in forest SW of the present training centre, 15 March 1982 (G. Walbridge *in litt.*); one 3 February 1984 (C. Linfoot, *in litt.*); two, 1 May 1987 (D. Pearse, G. Speight *in litt.*); one 22 January 1988 (G. Backhouse, *in litt.*).

All records from Khao Yai are now more than a decade old, with no recent sightings in spite of the increased coverage of recent years. There is evidence that it was formerly commoner, and it is probable that the present national rarity of this species is due to the destruction of lowland forest.

Orange-breasted Pigeon *Treron bicincta*

World Range	India and Sri Lanka to SW China; discontinously through SE Asia to Java and Bali (Robson, 2000).

Thai Range	Chiefly deciduous or semi-evergreen forests of the plains and foothills in W, NE, SE. Found also in forest edge and scrub in the peninsula (Lekagul and Round, 1991). Generally uncommon and scarce. In addition to Khao Yai, known from another 15 protected areas (data held on file at CCB, Mahidol University).
Conservation Status	• At Risk in Thailand: near-threatened (Round, 2000) • Potentially at Risk In Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	One female, lowland open woodland and cultivation on the northern park boundary at Takhian Ngaam, 13 November 1999. Not listed by McClure (1974) or previous authors, though known from sparse records from the deciduous forest ecotone around the northern viewpoint.
Pang Sida	Listed in RFD Master Plan for Pang Sida.

Pompadour Pigeon *Treron pompadora*

World Range	India to SW China; discontinuously through SE Asia to the Philippines and Moluccas (King *et al.*, 1975)
Thai Range	The north and west, parts of the north-east and the south-east. Scarce: known from only 12 parks and sanctuaries (data held on file at CCB, Mahidol University).
Conservation Status	• At Risk in Thailand: Vulnerable (Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	Heard at two locations on the Upper Lam Phraya Than Drainage at c. 500 m elevation: one south of Camp 1, 16 November; another on Khao Khat, Lam Phraya Than Drainage, 17 November 1999. Elsewhere in the north-east of the park, two males and two females seen with a flock of *T. curvirostra*, Khlong Pakang Guard Station, 12 August 1985 (Kant Ratanajun, Wachara Yusawat, pers. comm.) Listed by McClure (1974) and Flotow (1980) for the headquarters area of the park where it is very scarce. There have been a few reports, usually of no more than 2–4 birds, but at least some of these records may be due to confusion with other species such as Thick-billed Pigeon *T. curvirostra* or Wedge-tailed Pigeon *T. sphenura*.
Sakaerat	One bird seen, 20 January 1985 (author, own data)
Pang Sida	Listed for Pang Sida on MASS database at Center for Conservation Biology, but source uncertain.
Ta Phraya	Not found during the present survey, though listed by J. Nabhitabhata (*in litt.*).

Pompadour Pigeon should be present throughout DPKY at lower elevations, but it is very much scarcer than *T. curvirostra*. It is not yet known for Thap Lan though seems almost certain to occur there.

White-bellied Pigeon *Treron sieboldii*

World Range	C, S and E China, Taiwan, Japan; Thailand, central Lao PDR and Vietnam (Robson, 2000).
Thai Range	Relatively little known possibly due to confusion with other Treron spp. First recorded from Loei Province (Deignan, 1963) but

	subsequently found in the north-west (Chiang Mai Province) south to Kaeng Krachan (Phetchaburi Province). Most sightings have been in the montane zone, 1000–2000 m.
Conservation Status	• IUCN Near-threatened (Collar *et al.* 1994) though not listed by BirdLife (2001) • At Risk in Thailand: Vulnerable (Round, 2000) • Little-known in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	A male seen incubating on a nest, near the summit of Khao Khieo, 12 August 1992 (Wichian Kongtong, pers. comm.). One male at the fire-station with a flock of c. 10 Wedge-tailed Pigeons on 10 February 2002 (author).

Green Imperial Pigeon *Ducula aenea*

World Range	Occurs from India throughout SE Asia, the Philippines and Indonesia to New Guinea (King *et al.*,1975).
Thai Range	Once widespread through all regions of the country apart from the Central Plains (Deignan, 1963). Much reduced and has disappeared from much of its range with reduction in lowland forest. The main stronghold is in the south, mainly on offshore islands, where known from 8 protected areas. In continental Thailand there are records from 13 reserves, but populations are believed to be small apart fom at Huai Kha Khaeng (MASS database). In continental Thailand and indochina it appears to be commonest in "lowland forest mosaic" (after Thewlis *et al.*, 1998)
Conservation Status	• At Risk in Thailand: vulnerable (Round, 2000). • At Risk in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	A single Ducula in flight near camp 2 (UTM 991846, c. 440 m elevation), was probably this species. This species was first recorded for Khao Yai "near the barrier bridge" on 7 September 1963 (Dickinson and Tubb, 1964). There have been very few if any reliable subsequent sightings until the present survey. The species is almost certainly absent from the heaquarters area of the park and is presumably confined to the lowland margins of the park, where, however, it must be very scarce.
Thap Lan	One *Ducula* sp. in flight at Sap Sadao, 16 December, was probably this species.
Pang Sida	Recorded by S. Henson in August 1993 (A. Mauric *in litt.*) though no information on population is available.
Ta Phraya	Frequent around the heaquarters area of the park (recorded on 4 days, maximum 20 birds). Present in smaller numbers around Sa Saam and Chong Takhieu.

The only *Ducula* pigeons recorded anywhere in lowland areas of Khao Yai, or in Thap Lan, were those detailed above. This indicates that populations have been very greatly reduced by hunting. In the national context, therefore, the population in Ta Phraya is highly significant.

Masked Finfoot *Heliopais personata*

World Range	NE India, Bangladesh, Myanmar, Thailand, Cambodia S Lao PDR and southern Vietnam; Malaysia, Sumatra and Java. The only breeding records are from NE India and S Myanmar (Robson, 2000), though breeding is suspected in many parts of the mainland SE Asian range.
Thai Range	Most records are from mangroves along both coasts of the peninsula, where the species is thought to be a non-breeding visitor. Records elsewhere, on inland streams and river in Khao Yai and in the north, correspond with dates of possible northward passage in the early wet-season. Breeding is possible, perhaps in Huai Kha Khaeng, or elsewhere in the western forest complex, but there is relatively little coverage in the wet season.
Conservation Status	• IUCN Vulnerable • At Risk inThailand (Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999) • World population estimated at less than 10,000 birds (Rose and Scott, 1997).
Khao Yai	A male photographed on the Lam Takhong near the park headquarters, 20 July 1987 (D. Buckingham, *in litt.* to PDR) is the only record for DPKY.

Thap Lan possesses apparently suitable still-water habitat along major streams which appears suitable for this species.

Pheasant-tailed Jacana *Hydrophasianus chirurgus*

World Range	India, S China and SE Asia to the Greater Sundas and Philippines (King *et al.*, 1975)
Thai Range	Both winter visitor and resident (Lekagul and Round, 1991). Winters widely on still-water bodies throughout the country. Regular breeding is known with certainty from Bung Boraphet and a very few sites in the lower central plain, where the total population is in the low hundreds of pairs.
Conservation Status	• At Risk in Thailand (Round, 2000)
Thap Lan	Listed for the park by Mr. Pornchai Wisutatharn (*in litt.*)

DPKY is not thought likely to be of conservation importance for this species since the available habitat is small.

Grey-headed Lapwing *Vanellus cinereus*

World Range	Breeds in NE China and Japan, and winters widely from Nepal and NE India eastwards through the SE Asian mainland (Robson, 2000)
Thai Range	Winters widely throughout Thailand, though scattered in small numbers.
Conservation Status	• IUCN Near-threatened (Collar *et al.*, 1994) though not listed by BirdLife (2001). • At Risk in Thailand (Round, 2000)

	• Potentially at Risk in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	One on 6 February 1995 (P. Crouzier, *in litt.*) is the only record for DPKY.

DPKY is not of conservation significance for this species, which winters in wetlands and open paddy basins.

Jerdon's Baza *Aviceda jerdoni*

World Range	S and E India to SW and S China, and patchily throughout mainland SE Asia to Greater Sundas, Sulawesi and Philippines (Robson, 2000).
Thai Range	Widespread in forest areas of north, north-east, south-east and western Thailand; also resident in the peninsula at least as far south as Trang Province.
Conservation Status	• IUCN Near-threatened (Collar *et al.*, 1994) though not listed by BirdLife (2001). • CITES Appendix II
Khao Yai	One flushed from near the summit of Khao Rom, 7 November 1999. This is an unusually high elevation for this species. One perched near park headquarters, 11 February 2000. The species is seen regularly in the park headquarters area, with records almost year-round.
Thap Lan	Not detected during the survey; listed in the RFD Master Plan.
Pang Sida	Seen August 1993 by S. Henson (A. Mauric, *in litt.*)

Black Kite *Milvus migrans*

World Range	Widely distributed from N Africa, across Eurasia, India, China and through SE Asia to New Guinea and Australia. Northern populations are migratory, wintering well to the south (Robson, 2000).
Thai Range	Breeding *M.m govinda* are known from the central plains and formerly the peninsula. Migrant *M.m lineatus* is a non-breeding visitor throughout the country.
Conservation Status	• At Risk in Thailand: Endangered (Round, 2000). • At Risk in Lao PDR (Duckworth *et al.*, 1999) • CITES Appendix II Resident *govinda* is close to extinction, and currently known from a small population around Ayutthaya, while numbers of migrant *lineatus* have plummeted within the past decade.
Khao Yai	Listed by McClure (1974) from one migrant *lineatus* seen over the erstwhile T.A.T. complex near the park headquarters on 24 October 1970 (H.E. McClure *in litt.* to PDR).
Sakaerat	Listed: source unknown.

DPKY is not thought to be of conservation significance for this species, which chiefly inhabits the more open lowland areas, though the lowland open paddy basin south of (and outside the boundary of) Ta Phraya could potentially hold a few wintering birds. A few passage migrants would be expected to pass through.

Brahminy Kite *Haliastur indus*

World Range	India, S China, north to the Yangtze River, and SE Asia to Australasia and SW Pacific (Robson, 2000).
Thai Range	Formerly widespread on the northern and eastern plateaus, and the central plains, along major waterways, as well as along both seacoasts. Now largely restricted to seacoasts, where numbers are much reduced. A few individuals still inhabit the lower central plain and a few waterbodies in the north-east (where near vanishing point)
Conservation Status	• At Risk in Thailand (near-threatened; Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999) • CITES Appendix II
Khao Yai	A bird was sighted on 6 March 1990 (Sandra L. Cohen and R. Struve, *in litt.*) and another was seen on 23 August 1993 (P.D. Round, unpubl. obs.). However the circumstances of these sightings, both made around the park headquarters, would suggest that the birds were released captives.
Ta Phraya	Reported to occur by J. Nabhitabhata (*in litt.*) though the basis for this is not clear. None was found during the current survey.

The usual habitat of this species is seacoasts and large lowland rivers. While birds were once found throughout the eastern plateau, inland populations have declined very greatly and the chances of genuine vagrants in DPKY are very small. Even larger streams in DPKY, such as Lam Phraya Than in Khao Yai or the Lam Chae in Thap Lan, both of which were covered during the current survey, are possibly too narrow and slow-flowing reaches too restricted in extent to support this species. A few might enter the lowland southern margins of Ta Phraya from the Cambodian Great Lake basin, but on the whole DPKY is unlikely to be of conservation significance for this species.

Grey-headed Fish Eagle *Ichthyophaga ichthyaetus*

World Range	Indian subcontinent throughout SE Asia to the Greater Sundas, Philippines and Sulawesi (Robson, 2000).
Thai Range	Currently known only from Chalerm Prakiat Wildlife Sanctuary, Narathiwat and (probably) the Phetchaburi river in Kaeng Krachan National Park
Conservation Status	• IUCN Near-threatened • At Risk in Thailand (Critical; Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	One seen flying north-west over the park on 27 December 1964 by E.C. Dickinson and others (Dickinson, 1968). One seen in flight within 1 km of the Khlong Tha Dan at c. 400 m elevation (UTM 588810), 12 January 1989 and 14 November 1989 (author). Both sightings were thought to be of an immature bird.

Records of this species may be open to some slight question due to the possibility of confusion with the (only marginally less scarce) Lesser Fish Eagle *I. humilis*. Detailed notes or photographs from any future sightings are required to document future observations of fish eagles.

Rufous-winged Buzzard *Butastur liventer*

World Range	SW China, through Myanmar and parts of Thailand into Indochina, with populations on Java and Sulawesi, Indonesia (King *et al.*, 1975).
Thai Range	Scarce, throughout lowlands and foothills of NW, W and NE Thailand, and the northern central plains, in open woodland. Present in those areas of farmland possessing a high density of relict forest trees. It is currently known from 11 protected areas (MASS Database)
Conservation Status	• IUCN Near-threatened (Collar *et al.*, 1994) though not listed by BirdLife (2001). • At Risk in Thailand (Near-threatened; Round, 2000)
Khao Yai	Listed by Dickinson (1963): an adult and immature bird seen circling over the park on 11 August 1963. McClure (1974) also apparently recorded a single bird without giving details. One seen by the erstwhile TAT Motor Lodge on 29 December 1989 was unable to fly; had the primaries on the left wing missing and was assumed to be a released captive (A.J. Helbig, *in litt.*) It can be expected that it was formerly present in areas of dry open woodland around the park margins, though it was not recorded in Khao Yai during the present survey.
Sakaerat	Present (Wichian Kongtong, pers.comm.).
Thap Lan	One by park headquarters, 14 December. One individual seen outside the nothern park boundary in open paddies with scattered trees, 14 December (UTM809153).
Ta Phraya	Present in open lowland woodland near the heaquarters where a single bird was seen repeatedly, 9-19 September. One in open dry dipterocarp woodland scattered among near the Chong Takhieu Guard Station, 13 September.

Though principally restricted to dry dipterocarp woodland, it is occasionally found in the more open evergreen forests including fire-damaged secondary habitats. It appears to be one of a suite of bird species restricted to dry open woodlands and semi-natural savannas. Others showing a similar distribution in Thailand include Pied Bushchat *Saxicola caprata* and Burmese Shrike *Lanius collurioides*.

The population within DPKY is likely to be very small and here, as elsewhere in the country, more birds probably occur outside than inside the protected area boundaries. This species might therefore be particularly at risk from any expansion in the areas of plantation forestry in so-called "degraded" forests.

Black Eagle *Ictinaetus malayensis*

World Range	India, SE China and throughouut SE Asia to the Greater and Lesser Sundas, Sulawesi and the Moluccas (King *et al.*, 1975).
Thai Range	Although widely distributed and known from at least 28 protected areas in Thailand (Data held on file at CCB, Mahidol University), it is scarce and occurs at low density in mature evergreen forest.
Conservation Status	• At Risk in Thailand (near-threatened; Round, 2000) • CITES Appendix II

Khao Yai	One or two pairs present on the Khao Khieo-Khao Rom ridge where nesting was observed in February 1994. One gliding along the ridge above the village of Ban Sap Tai, Muak Lek District, Saraburi, October 1982 (author; unpubl. obs.).
Thap Lan	One in flight over a large forest clearing near the WFT project site, UTM 209810, 14 November 1999.
Pang Sida	Observed by a BCST group during 14–16 October 1994 (Data held on file at CCB, Mahidol University).

Imperial Eagle *Aquila heliaca*

World Range	Eurasia from E Europe to central and NE Asia, wintering south to the Indian subcontinent and SE Asia south to Malaysia. (Collar *et al.*, 1994)
Thai Range	Scarce on passage and in winter in the north-west, north-east, Central Plains and SW. Presumably also occurs in the peninsula as it has been recorded in Malaysia in winter.
Conservation Status	• IUCN Vulnerable • Little Known in Lao PDR (Duckworth *et al.*, 1999) • CITES Appendix II
Khao Yai	One first-year bird was seen soaring over the Khao Khieo viewpoint, 9 February 2002. This is the only record for DPKY.

Mountain Hawk Eagle *Spizaetus nipalensis*

World Range	Indian subcontinent to NE China, Russian Far East, and Japan; widespread in continental SE Asia. Northern populations are migratory. (Robson, 2000).
Thai Range	Probably resident throughout, from the north, north-east, west and most of the peninsula. Known from c. 23 protected areas (Data held on file at CCB, Mahidol University), but scarce and apparently at low density.
Conservation Status	• At Risk in Thailand (near-threatened, Round, 2000) • CITES Appendix II
Khao Yai	Believed resident in Khao Yai with many records spanning the months October to June. In Lekagul and Round (1991) it is shown only as a non-breeding visitor.
Thap Lan	One immature by the TL4 Guard Station, UT 165854, 14 November 1999. The bird was perched and the erect crest seen well.
Ta Phraya	Recorded during the present survey: one at Chong Takhieu on 13 September 1999.

White-rumped Falcon *Polihierax insignis*

World Range	Myanmar, continental Thailand, Cambodia, S and C Lao, S. Vietnam (King *et al.*, 1975).
Thai Range	Inhabits dry dipterocarp woodland and occasionally open grassy areas or parkland in mixed deciduous forest in lowlands and foothills. It seems to be scarce throughout its range. It is currently known from 13 protected areas (Data held on file at CCB, Mahidol University).

Conservation Status	• IUCN Near-threatened • Potentially at Risk in Lao PDR (Duckworth *et al.*, 1999) • CITES Appendix II
Sakaerat	Listed by Ngampongsai and Lauhachinda (1988). Present, Rarely seen and evidently very scarce. (Wichian Kongtong, pers. comm.)
Thap Lan	A pair of birds roosted close to Sap Sadao Guard Station in dry dipterocarp woodland on 15–16 December

An unconfirmed sighting was reported from Khao Yai in c. 1985–1986. However details provided were scant; the habitat was atypical and the record is best discounted. The population within DPKY and in protected areas throughout the country as a whole must be small. The speces seems naturally to occur at low density, and is only found in plains and foothills habitat so that the available area for it within parks and sanctuaries is limited. Such populations as remain outside protected areas would be at risk from any expansion of commercial, plantation forestry.

Oriental Darter *Anhinga melanogaster*

World Range	Indian subcontinent, Myanmar, Thailand, Cambodia, Lao, Vietnam, to the Greater Sundas, Sulawesi and Philippines (King *et al.*, 1975).
Conservation Status	• IUCN Near-threatened • At Risk in Thailand (endangered; Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999) Has declined markedly in Thailand (Lekagul and Round, 1991). Rose and Scott (1997) estimated the world population of Oriental Darter as 4000 birds.
Khao Yai	Not recorded during the current survey but an irregular visitor to the open water bodies on the plateau, near the park headquarters, first recorded on 12 April 1963 (Dickinson, 1963). Post 1990 sightings, all of single individuals, cover the period 14 June 1992 to May 1995. Typically, such sequences of sightings over a few years are interspersed with longer periods lacking records.

This suggests that the few Oriental Darters seen in Khao Yai are wandering individuals which are failing to breed. It might be expected on still water reaches of the rivers in Thap Lan, since it occurs in similar habitat on the Khwae River system, in Thung Yai. Up to 2–3 birds were recorded from water bodies in Phu Khieo Wildlfe Sanctuary, Chaiyaphum in the early 1990s. In recent years, small breeding populations have been discovered at two sites in the lowlands outside DPKY margins, in Sa Kaeo Province and in Nakhon Nayok (data supplied by Bird Conservation Society of Thailand).

Malayan Night Heron *Gorsachius melanolophus*

World Range	SW and NE India, SW and S China throughout SE Asian mainland. Winter visitor to S Thailand and Malaysia (Robson, 2000).
Thai Range	Resident in forest areas and wooded secondary growth in the north, west, north-east and south-east. A passage migrant in the central plains and winter visitor or passage migrant in the peninsula. Mainly found at lower elevations.
Conservation Status	• At Risk in Thailand (near-threatened, Round, 2000)

Khao Yai	One flew upstream at dusk just outside the park boundary, near the Bu Phram Guard Station, 19 November 1999. The species is seen regularly around the headquarters area of the park with records spanning the full year, including period when migrants would be absent. Calling birds have been heard during the presumed breeding season.
Pang Sida	Recorded by S. Henson in July 1993 (A. Mauric, *in litt.*)

This species can be expected to be present throughout DPKY, but is secretive and difficult to detect. Moreover, the survey took place at a time of year when its booming call would not normally be heard.

Schrenck's Bittern *Ixobrychus eurhythmus*

World Range	Breeds in E and NE Asia; winters to the Greater Sundas, Philippines and Sulawesi; recorded mainland SE Asia on passage (Robson, 2000).
Thai Range	Sparsely recorded from the north, SE, central and peninsula,
Conservation Status	• IUCN Near-threatened (Collar *et al.*, 1994) though not listed by BirdLife (2001). • At Risk in Thailand (near-threatened: Round, 2000) • Little-known in Lao PDR (Duckworth *et al.*, 1999)
Khao Yai	One male flushed from the roadside below the summit of Khao Khieo, 22 October 1997 (P.D. Round, unpubl. obs.) is the only record for DPKY or for any area in NE Thailand.

Assessment of the status of this species is hampered by confusion with the common resident and non-breeding vistor Yellow Bittern *I. sinensis*. Most authenticated records of *I. eurhythmus* have been from forest areas.

Spot-billed Pelican *Pelecanus philippensis*

World Range	Indian subcontinent, Myanmar, Thailand, C and S Lao PDR, Cambodia, and Vietnam, occasionally straying south to Malaysia and Java); formerly Philippines and possibly E China (Robson, 2000).
Thai Range	North, north-east, west, central and peninsular Thailand. Most records are of migrant or wandering individuals There are no historical nesting records from Thailand, where breeding populations are assumed to have been extirpated before the era of modern ornithology. A few pairs escaped from zoos are nesting around Bangkok, however.
Conservation Status	• UCN Vulnerable • At Risk in Thailand • At Risk in Lao PDR (Duckworth *et al.*, 1999). Rose and Scott (1997) estimated the SE Asia population at only 1500 individuals.
Khao Yai	20 flew over Khao Cha-ngok, Nakhon Nayok Province, 29 May 1999 (Bird Conservation Society of Thailand). Though outside the park boundary this sighting would seem to indicate passage through the park.

	A shot (winged) bird was transported to the park and released on the Lam Takong, where seen during 18 November to 23 November 1985 by M. Martinsson and K. Berg
Ta Phraya	A single bird was seen on a small lotus pond near headquarters in the year preceding the survey (*per* Mr. Preecha Phurahong, pers. comm.). The restricted area of wetland (the pond was only a few metres in diameter) probably indicate this was an injured bird.

Small numbers of pelicans are seen annually in the Thai gulf, and are assumed to emanate from the Cambodian breeding population. The presence of migrants or wanderers in DPKY should be expected, though no significant areas of wetland habitat exist to support this species within the boundaries of DPKY reserves.

Asian Openbill *Anastomus oscitans*

World Range	Indian subcontinent through Myanmar, Cambodia, Thailand, S. Lao PDR, and Vietnam (King *et al.*, 1975).
Thai Range	Central Thailand and parts of the north and north-east; straying also to the Peninsula.
Conservation Status	• IUCN Near-threatened • At Risk in Thailand (Near-threatened: Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999). Rose and Scott (1997) estimated the world population as greater than 125,000 individuals. Amget (1986) counted 14,656 nests at the then principal Thai colony, Wat Phai Lom, in 1985, but only 8,581 in the following year. There are no more recent estimates.
Khao Yai	One flew over Nong Pak Chi, 30 December 1990 (Kamol Komolphalin, pers. comm.)
Ta Phraya	A flock of 12 flew west over the plain at the foot of the Chong Takhieu scarp, 13 September 1999.

The Ta Phraya sighting probably indicates exchange of birds between Cambodia and Thailand (the species beeds in both countres). The timing of the sighting was shortly before the commencement of the annual nesting cycle of Asian Openbill in Thailand.

Black Stork *Ciconia nigra*

World Range	Southern Africa, and patchily across Eurasia to N China and Mongolia; wintering southern Africa, Indian Subcontinent, S China and northern SE Asia (Robson, 2000).
Thai Range	A few sightings along the Mekong River in the far north, though there are single records for Huai Kha Khaeng, western Thailand, and for Khao Sam Roi Yot, Prachuap Khirikhan Province
Conservation Status	• At Risk in Thailand (endangered, Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999) • CITES Appendix II
Khao Yai	Vagrant: one photographed in grassland at Bung Phai, NW of the headquarters, on 21 January 1995 (Suthep Kritsanavarn, pers. comm.). This is the only record of this scarce migrant for NE Thailand.

Though not regarded as globally threatened by Collar *et al.*, (1994) because of the large numbers in Europe and SW/S Asia, the species is clearly at risk in eastern Asia where Rose and Scott (1997) estimated the wintering population at only 500 birds.

[**Woolly-necked Stork** *Ciconia episcopus*]

World Range	Africa, Indian subcontinent through Myanmar, Cambodia, Thailand, Lao PDR, and Vietnam (King *et al.*, 1975)
Thai Range	Formely occurred at low density in waterholes in lowland forest and open wooded areas througout the entire country (Deignan, 1963). The only population known recently is from Khao Ang Ru Nai Wildlife Sanctuary, Chachoengsao Province, where up to six birds were still present in the early 1990s (many observers; data held on file at CCB, Mahidol University). A single bird resident at Kaeng Krachan National Park, Phetchaburi, disappeared sometime during the early or mid-1990s
Conservation Status	• At Risk in Thailand (Critical, Round, 2000). • At Risk in Lao PDR (Duckworth *et al.*, 1999)
Ta Phraya	Listed by J. Nabhitabhata (*in litt.*) on the basis of a local report of a pair nesting in the top of a *Dipterocarpus* sp. near the Thai Cambodian border. The record should be treated as unconfirmed but probable.

Not considered at risk by Collar *et al.*, (1994) because of the large African population. Rose and Scott (1997) considered that the SE Asian population numbers less than 10,000 individuals. In the national context, where the species is nearing extinction, even one pair in Ta Phraya would be significant.

Lesser Adjutant *Leptoptilos javanicus*

World Range	India, S. China, Southeast Asia, Greater Sundas (King *et al.*, 1975).
Thai Range	The few residents are confined to two sites in the peninsula, though wandering birds still occur in the central plains from time to time.
Conservation Status	• IUCN Vulnerable • At Risk in Thailand (critical: Round, 2000) • At Risk in Lao PDR (Duckworth *et al.*, 1999) Rose and Scott (1997) estimated the world population at only 5000 birds.
Khao Yai	Two in flight over the Lam Takhong Valley, seen from below the viewpoint, 8 January 1979 (P.A. Dukes, pers. comm.)

It would be expected that small numbers of this endangered species might pass through the area. Such birds are presumed to have come from Cambodia where a small population is present on the shores of the Great Lake and some other places in the country. However, DPKY probably has little significance for the conservation of the species owing to absence of suitable habitat (open forest of plains, with waterholes).

Greater Adjutant *Leptoptilos dubius*

World Range	NE India, Myanmar, Thailand, Cambodia, southern Vietnam (Robson, 2000).

Thai Range	Formerly recorded from the north, central plains and the south-east (Deignan, 1963). It is assumed that the species once bred in Thailand but that breeding populations were lost before the era of moden ornithological recording. Wandering individuals (including many shot birds) were recorded most years in NE Thailand and the Central Plains during the 1980s, but records have dwindled.
Conservation Status	• IUCN Endangered • At Risk in Thailand (Critical: Round, 2000) Estimated world population less than 700 individuals (Rose and Scott, 1997)
Khao Yai	Two in flight over the headquarters area, 8 December 1987 (Lee Jones, *in litt.*). One at Khao Phaeng Maa, at the NE corner of the park, 1 November 1998 (Suthee Supparatvikorn, *in litt.*).

It would be expected that small numbers of this endangered species might pass through DPKY. Such birds are presumed to have come from Cambodia where is a small breeding population is present on the shores of the Great Lake and in northern plains (WCS Cambodia Programme).

DPKY probably has little significance for the conservation of the species owing to absence of suitable habitat (open forest of plains, with waterholes), though the plains to the south of the area, along the Bang Pakong River, could support birds on passage.

Silver Oriole *Oriolus mellianus*

World Range	Breeds S and W China. Known in winter only from Thailand and Cambodia (Robson, 2000).
Thai Range	Known only from seven protected areas: Mae Yom in the north; Khao Yai, Khao Ang Ru Nai, Khao Sabap and Khao Soi Dao in the south-east; Huai Kha Khaeng and Kaeng Krachan in the west. Inhabits evergreen forest from plains/foothills to c. 800 m.
Conservation Status	• IUCN Vulnerable • At Risk in Thailand (vulnerable: Round, 2000)
Khao Yai	A winter visitor in small numbers which has possibly declined in recent years. All records have been from around the headquarters area of the park and span the period 31 October to 31 March. During October to December 1985 at least four different individuls are thought to have been present (author, own data). The maximum number seen on any one visit was three birds on 31 March 1990 (Kamol and Patcharee Komolphalin, *in litt.*). Most sightings pre-date 1991 and the most recent known is 31 October 1992 (Nirandr Pomankul, *in litt.*).

The absence of recent records from Khao Yai and from other sites in DPKY during the present survey is an indicator of the great scarcity of this species and is potentially alarming.

Brown-rumped Minivet *Pericrocotus cantonensis*

World Range	Breeds C and SE China; winters S Myanmar, Thailand, Cambodia, Lao PDR and Vietnam (Robson, 2000).

Thai Range	Widespread and frequent winter visitor in evergreen and deciduous forest across a wide altitudinal range, from plains to at least 1100 m throughout the country, south to c. 8 deg N latitude. (Lekagul and Round, 1991).
Conservation Status	• IUCN Near-threatened (Collar *et al.* 1994) though not listed by BirdLife (2001). • At Risk in Thailand (near-threatened, Round, 2000)
Khao Yai	Heard daily on Khao Rom, 6–10 November. Four seen in lowland woodland at KY 3, 12 November. Recorded daily in the Lam Phraya Than drainage, 15–19 November, with a maximum daily count of 40 birds. Common in the headquarters area of the park and more numerous than either Rosy or Ashy Minivets.
Sakaerat	Present (Wachara Sanguansombat, *in litt.*)
Thap Lan	Found in dry dipterocarp at Sap Sadao, and in lowland semi-evergreen along the Lam Chae and Lam Praeng. Recorded on six days, with a maximum of ten birds per day.
Pang Sida	Listed by Krisnapol Wichapant and Somyot Ngowattana *in litt.* (two seen 12 October, 1994).

This species is more or less inseparable on call from both Rosy Minivet *P. roseus* and Ashy Minivet *P. divaricatus*. However, it greatly outnumbers Rosy, while Ashy is not known to be present at upper elevations during mid-winter, so aural records were presumed to be Brown-rumped Minivet. Many past records are not listed separately from Rosy Minivet with which *P. cantonensis* was formerly treated as conspecific.

It may be expected to occur in Ta Phraya, which was surveyed too early in the autumn for the species to be present. DPKY probably supports one of the largest populations of this species in any protected area complex in Thailand, possibly significant at a global level.

White-browed Fantail *Rhipidura aureola*

World Range	Indian subcontinent, Myanmar, Thailand, central and S Lao PDR, Cambodia and southern Vietnam (Robson, 2000).
Thai Range	Scarce and seemingly restricted to better quality dry dipterocarp woodland of low to moderate elevations in north and western Thailand, and the northern portion of the Central Plains (Lekagul and Round, 1991). Patchy and absent from many areas of apparently suitable habitat, with records from only 9 protected areas (data held on file at CCB, Mahidol Uiversity).
Conservation Status	• At Risk in Thailand (endangered: Round, 2000).
Thap Lan	Recorded in dry dipterocarp woodland near Sap Sadao guard station, in mixed species flocks with Common Woodshrikes *Tephrodornis pondicerianus*, minivets and other species. Recorded on five days with an estimated maximum of 5 per day.

These are the only records from NE Thailand. The species appears to be inexplicably absent from similar dry dipterocarp woodland in Sakaerat.

Japanese Paradise-flycatcher *Terpsiphone atrocaudata*

World Range	Breeds Japan, Taiwan and N. Philippines; winters in Malaysia, Greater Sundas and Philippines (Robson, 2000).
Thai Range	Recorded on passage in NW, SE, Central, and S Thailand, though very rare.
Conservation Status	• IUCN Near-threatened
Sakaerat	Two males in lowland plantation areas near the forestry training centre, outside but adjacent to the Biosphere Reserve boundary, 8–9 April 1996 (Wachara Sanguansombat, *in litt.*).

Green-backed Flycatcher *Ficedula elisae*

World Range	Breeds N China; winters in peninsular Thailand and Malaysia (Robson, 2000).
Thai Range	Most records are from the peninsula, from Krabi, Trang, Phatthalung and Satun Provinces, where it is a scarce winterer in lowland forest and mangroves.
Conservation Status	• At Risk in Thailand (Round 2000).

This species was formerly treated as conspecific with Narcissus Flycatcher *F. narcissina*, with which it is allopatric, but both sexes differ very significantly in plumage, suggesting that full species treatment is appropriate.

Khao Yai	Known from two sight-records near the park headquarters: a male, on 19 April 1996 (E. Christopherson and H. Thorhauge Rask); a female, 22 April 1998 (P. D. Round, unpubl. obs.). The timing of both these sightings accords with northwards spring passage.

Golden-crested Myna *Ampeliceps coronatus*

World Range	NE India, SW China and throughout mainland SE Asia to northern Malaysia (Robson, 2000)
Thai Range	NW, NE and SE and W Thailand. Scarce and little known in the peninsula. Inhabits semi-evergreen forest from plains to c. 800 m (Lekagul and Round, 1991)
Conservation Status	• At Risk in Thailand (near-threatened, Round 2000). • Potentially At Risk in Lao PDR (Duckworth *et al.*, 1999).
Khao Yai	Present, but uncommon in the Lam Phraya Than catchment; heard on 17 November; near camp 3, UTM013848. Four along the lower Lam Phraya Than valley, 19 November. There are many records from the headquarters area of the park, where often seen in groups of 2–6 birds (occasionally up to c. 10 birds). Most records come from the early part of the year when visiting flowering trees, *Erythrina* spp. or *Acrocarpus fraxinifolius*.
Sakaerat	Present (Wachara Sanguansombat, *in litt.*).
Thap Lan	Four birds near the Khlong Ai Lek stream crossing, in the Lam Chae Drainage, UTM 973856.
Pang Sida	Seen in July 1993 by S. Henson (A. Mauric, *in litt.*) and in December 1994 (Krisanapol Wichapant and Somyot Ngowattana, *in litt.*).

Ta Phraya	Two in open lowland woodland near headquarters, 14 September. Six in open woodland near cultivated and settled areas, SW of headquarters, 17 September.

Like Hill Myna, probably commonest at lower elevations, but also found at good density in submontane situations, as around Khao Yai headquarters. The distribution is often clumped at fruiting or flowering trees so the species is easily overlooked.

Hill Myna *Gracula religiosa*

World Range	India to S China, throughout SE Asia to Indonesia and the Philippines (King *et al.*, 1975).
Thai Range	Forest areas throughout country, chiefly in lowlands and lower hills. Numbers massively reduced with loss of forest cover combined with nest-raiding for the illegal avicultural trade. Populations are still high on some offshore islands
Conservation Status	• At Risk in Thailand (near-threatened, Round 2000).
Khao Yai	Probably commoner in the headquarters area of the park than in other sectors. Expectedly rare in montane forest on Khao Rom (one record), but frequent in low elevation forest around the northern and eastern park boundary: six near Ban Takhian Ngaam, 13 November. In the Lam Phraya Than drainage, recorded on five days with a maximum daily count of 12, though generally less common than expected, probably due to nest-raiding.
Sakaerat	Present (Saiwichian *et al.*, 1988; Wachara Sanguansombat, *in litt.*)
Thap Lan	Frequent; recorded daily in all sectors, inhabiting both dry dipterocarp and semi-evergreen forest, including highly disturbed areas. Maximum daily 20 birds
Pang Sida	Present (A. Mauric, *in litt.*)
Ta Phraya	Frequent in all areas surveyed. Recorded on 10 days with a maximum of 15 birds per day.

Hill Myna is still found in partly deforested country provided that suitable tall, hollow trees remains as nest-sites. These are routinely raided by local people so that capture for the pet trade remains a major threat to the species.

Limestone Wren Babbler *Napothera crispifrons*

World Range	Tenasserim, continental Thailand, N Lao PDR, northern Vietnam and extreme S China (King *et al.*, 1975).
Thai Range	Known from three disjunct populations: in the west (Kanchanaburi/ Tak); the north (Phrae to Nan) and in Saraburi. Assocated with forest around the bases of rugged limestone crags, but certainly absent from this habitat in areas other than those specified above.
Conservation Status	• At Risk in Thailand (Vulnerable (Round, 2000)
Khao Yai	Present on limestone crags at Khao Luuk Chang, in the NW of the park, where, so far as known, it has only been heard but not seen. Present maps of the park show Khao Luuk Chang as lying inside the park boundary.

The birds presumably belong to the endemic subspecies *L.c. calcicola* for which the type locality is Sathani Hin Lap, Saraburi Province (Deignan, 1939) and which is restricted to the south-west corner of the Khorat plateau. So far as known, Khao Yai is the only national park in which this subspecies is represented. The species is somewhat at risk nationally due to quarrying activity in much of its range.

Baya Weaver *Ploceus philippinus*

World Range	Indian subcontinent, SW and S China, throughout most parts of SE Asia, Sumatra, Java and Bali (Robson, 2000).
Thai Range	Found throughout the country in the more open lowland areas, tending to be in the more well-watered situations.
Conservation Status	• At Risk in Thailand (near-threatened: Round, 2000). • Potentially at Risk in Lao PDR (Duckworth *et al.*, 1999) Has declined massively due to trapping at roosts, primarily for sale as food. The flask-shaped nests are also collected as ornamentation.
Thap Lan	Listed as occurring by RFD Master Plan. If present, it is likely to be found in the lowland margins of the park
Pang Sida	Listed for the park on the MASS database, but authority not known.

DPKY is not likely to be of conservation significance for this species of open lowland areas.

Yellow-breasted Bunting *Emberiza aureola*

World Range	Breeds N Eurasia to Japan; winters Indian subcontinent; S China and the SE Asian mainland (King *et al.*, 1975).
Thai Range	Recorded throughout most of the country though mainly occurs in association with extensive lowland paddy basins.
Conservation Status	• At Risk in Thailand (near-threatened, Round 2000). Populations have declined greatly due to netting at communal roosts, both in Thailand and in China.
Khao Yai	Listed by McClure (1974).

DPKY is not likely to be of conservation significance for this species of open lowland areas.

Other noteworthy species

Accounts are presented for other species of particular interest, or where some discussion is needed to resolve provenance of past records in DPKY. This is particularly relevant to Khao Yai for which there are many discrepancies among the various faunal listings produced over the years, some of which were not fully clarified by CDC (1989).

White-browed Piculet *Sasia ochracea*

Khao Yai	One sight record from the NW region of the park, c. 1000 m elevation, 17 October 1982 (P.D. Round, unpublished data). One in a bamboo thicket 100 m inside the northern park gate on 23 January 1994 (J.J. Warham, in litt. to PDR).
Thap Lan	Listed in RFD Master Plan.
Pang Sida	Listed in RFD Master Plan.

This species, which is almost always associated with bamboo, is clearly very scarce in DPKY.

Grey-capped Woodpecker *Dendrocopos canicapillus*

Khao Yai	A single bird in open, near-mixed deciduous, woodland near Ban Pong Chanuan, 12 November 1999. One in tall semi-evergreen forest in the upper Lam Phraya Than catchment, 16 November 1999. These are believed to be the first records of the species for Khao Yai National Park. The species is certainly absent from forest around the headquarters area.
Sakaerat	Present, though authority uncertain.
Thap Lan	Fairly frequent in dry dipterocarp at Sap Sadao (1–9 daily; recorded on 58% of lists). Two singles in the Lam Chae/Sap Pet area, 18–19 December; present also on the upper Lam Praeng
Ta Phraya	Singles at three locations.

This species occurs in a wide variety of forest types, including the canopy of tall, semi-evergreen lowland forest but is commonest in deciduous dipterocarp woodland and pines.

Fulvous-breasted Woodpecker *Dendrocopos macei*

Sakaerat	Listed by Wachara Sanguansombat, (*in litt.*)
Thap Lan	Two to four recorded daily in dry dipterocarp woodland at Sap Sadao; found on 12.5% of lists. Much scarcer than its congener, *D. canicapillus*.

This species appears to be almost entirely restricted to the plains, and when found in forest, is limited to the better quality dry dipterocarp. However, it is also fairly widespread in moist, lowland cultivated areas where scattered trees remain among (*e.g.*) paddies, and is still present even in some Bangkok suburbs. It s known from only 10 protected areas in Thailand, where it is extremely scarce due to the limited area of lowland habitat within their boundaries. It is listed as Little Known in Lao PDR (Duckworth *et al.*, 1999).

Grey-headed Woodpecker *Picus canus*

Known from all DPKY reserves with the posssible exception of Sakaerat. It is scarce around the headquarters area of Khao Yai, however, most records coming from around the northern viewpoint. It tends to be limited to more open forests, and drier lowland forests.

Common Flameback *Dinopium javanense*

Khao Yai	Present in forests along the Lam Phraya Than Drainage. Found in both lowlands and uplands to at least 400 m elevation

There do not appear to be any undoubted records from the headquarters area of the park (700–800m), and it appears to be mainly restricted to the lower elevations. It was present in an isolated stand of *Lagerstroemia calyculata* trees outside the northern park boundary until the mid- or late 1980s, but has not been recorded there in recent years, as the stand has progressively thinned-out, the older or more fire-damaged trees dying off.

The species was otherwise found widely throughout the DPKY reserves.

Hoopoe *Upupa epops*

Apparently represented in Thailand by both resident and migrant populations.

Khao Yai	Scarce; few records. Recorded from the headquarters area, April 1989 (C. and T. Inskipp, *in litt.*)

Found in the more open areas in all other DPKY reserves.

Ruddy Kingfisher *Halcyon coromanda*

Khao Yai	Scarce passage migrant, known from a single sight record in forest at Mo-Singto, 14 April 1983 (P.D. Round, unpubl. obs.). This is the only record from DPKY.

A scarce resident in riverine forests of the lowlands and in mangroves and on inland forest on islands. Wintering and migrant birds from northern Asian populations occur more widely.

Moustached Hawk Cuckoo *Hierococcyx vagans*

Ta Phraya	One heard in forest c. 5 km west of headquarters, September 1999.

The distribution of this species in DPKY is unclear. It is known with certainty only from the far east of the region. It may well be more widespread, but would have remained undetected at the time of year during which the survey took place.

Indian Cuckoo *Cuculus micropterus*

Khao Yai	Heard, 5 or 6 April 1988, (D. Pearce *in litt.* to PDR.)
Pang Sida	Observed in August 1993 (A. Mauric, *in litt.*)
Ta Phraya	One heard in the Sa Saam area, 10 September.

As with the preceding species, the time of year at which the survey took place might have missed this species due to the low frequency of calling. It has both resident and migrant populations.

Oriental Cuckoo *Cuculus saturatus*

Khao Yai	One, 18 November 1988 (U. Treesucon, pers. comm.).
Thap Lan	Listed by Mr. Pornchai Wisutatharn (*in litt.*).

So far as known from records elsewhere, this species is a scarce late autumn and early spring passage migrant.

Plaintive Cuckoo *Cacomantis merulinus*

Khao Yai	Listed by McClure (1974) as a vagrant. There have been occasional subsequent records from more open areas around the park headquarters and it is presumed to have colonised along the corridor of disturbed habitats along the roadside.

Present in all DPKY reserves.

Asian Emerald Cuckoo *Chrysococcyx maculatus*

Khao Yai	Annual winter visitor, with records from 26 September (J.N. Dymond, *in litt.* to PDR) onwards throughout the winter season. No reliably recorded latest spring date.
Sakaerat	Present in winter (Wachara Sanguansombat, *in litt.*)
Thap Lan	Listed by Mr. Pornchai Wisutatharn (*in litt.*). A female *Chrysococcyx* cuckoo glimpsed on the Lam Chae, 18 December, was either this species or Violet Cuckoo.

Violet Cuckoo *Chrysococcyx xanthorhynchus*

Khao Yai	Recorded around the headquarters area of the park during October (Uthai Treesucon, pers. comm.); 4 November (female: BBCB 6, no. 12, Dec 1989; on 26 November 1990 (E.T. Myers, P. Heath, *in litt.*); at Nong Pak Chi, February 1992 (J. Baker, pers. comm.) and at the Orchid Waterfall campsite in February 2001
Pang Sida	One seen January 1996 (J.N. Dymond, *in litt.*).

This species is scarce or irregular around the Khao Yai headquarters, which is towards the upper end of its altitudinal range. It may be expected to be commoner in the lowlands in the east of the park, and in the generally lower elevation parks of DPKY to the east of Khao Yai. It was probably under-recorded during the present survey due to the time of year, with little breeding activity or vocalizing. Migrant individuals may possibly occur as well as the expected residents.

Asian Koel *Eudynamys scolopacea*

Khao Yai	Two seen and heard, northernmost park checkpoint, 8 Sep 1982 (R.S.E. Swanquist *in litt.*). Heard by headquarters, February 2000 and both heard and seen February 2003 (author). This species, which is a nest-parasite of Large-billed Crow *Corvus macrorhynchos*, and some mynas, may be a new colonist to the headquarters area of the park since it is mainly linked with man-disturbed areas. It was not listed for the park by previous authors.

The species is present in all DPKY reserves treated.

White-throated Needletail *Hirundapus caudacutus*

Khao Yai	One, 4 March 1982 and 6 March 1982 (S.J.M. Gantlett, G. Walbridge, pers.comm.); one, 27 April 1989 (S. Usui, pers. comm.); two, 29 April 1989 (R. Brace, *in litt.*); one, 8 April 1990 (T. Luijendijk); "several" early April 1992 (C. Byers, pers. comm.)

A scarce passage migrant. All records so far have been in spring, probably reflecting the greater coverage of Khao Yai at this time, but probably occurring in autumn also.

Silver-backed Needletail *Hirundapus cochinchinensis*

Khao Yai	Recorded throughout the winter season, chiefly from January onwards, through records from as late as 1 June 1986 (c. 20 birds),

	and 19 June 1983 (P. Alexander-Marrack, *in litt.*) could suggest that this little-known species may be resident.
Sakaerat	Listed by Ngampongsai and Lauhachinda (1988).
Thap Lan	c. 5 seen over the reservoir near Sap Sadao, 16 December.

Pacific Swift *Apus pacificus*

Ta Phraya	Westwards movements of presumed migrants, showing the broad rump band typical of northern migrant *A.p. pacificus*, were noted on six dates in September. The largest daily total was 30 birds.
Pang Sida	A report by S. Henson in August 1993 seem unusually early for migrant birds.

There are records also from Khao Yai and Sakaerat, and the species may also be presumed to occur in Thap Lan.

Crested Treeswift *Hemiprocne coronata*

Khao Yai	Absent from the headquarters area of the park, and probably most of the park interior. A sighting of a bird near the Takhian Ngam (KY 3) Guard Station on the northern boundary of the park on 13 November 1999 appears to be the first and only record for the park.
Sakaerat	Present; listed by Wachara Sanguansombat (*in litt.*)
Thap Lan	Present at both Sap Sadao and Lam Chae/Sap Pet areas
Pang Sida	Present; listed by Alain Mauric, (*in litt.*)
Ta Phraya	Frequent in disturbed open forest in the HQ valley (80% of lists) and near the village area (75% of lists).

This species is widespread in more open lowland forest of continental Thailand, but apt to be somewhat patchy and scarce. It is found also in the more open montane forest in NW Thailand.

Oriental Scops Owl *Otus sunia*

Khao Yai	Listed by McClure (1974), although no details are provided. The only records are from near the headquarters area of the park, 700–800 m and are all presumed to be migrants. One heard at night (U. Treesucon, pers. comm.) had a three-note call, different from the usual four-note call of the resident race. One was also heard "late November" 1990 (E.T. Myers, *in litt.*). One roosted in a small clump of trees in the garden of the park superintendent, December 1996–January 1997.
Sakaerat	One heard, 16 July 1988 (U. Treesucon, pers. comm.)
Thap Lan	Heard in dry dipterocarp forest at the Sap Sadao Guard Station
Ta Phraya	Two birds heard calling near park headquarters, 9, 10 and 18 September 1999.

Resident birds, *O.s. distans*, inhabit dry lowland forests, including dry dipterocarp forest, mixed deciduous forest and both evergreen and deciduous trees in open savanna. *O.s. stictonotus* is a winter visitor from Northern Asia, and occurs in a wider range of habitats, including evergreen secondary growth and occasionally orchards and gardens.

Brown Fish Owl *Ketupa zeylonensis*

Khao Yai A (presumably) single individual was seen "at a pool along the Lam Ta Khrong" (*sic*) on 12 and 13 April 1964 (Dickinson and Tubb, 1964). The only subsequent sightings of fish owls identified to species from the headquarters area of the park are of Buffy Fish Owl *K. ketupu* and it is thought that these two species may be ecologically segregated on habitat, with Brown Fish Owl tending to be in lower-lying areas, with drier, more open forests.

This appears to be the only record of this species from anywhere in DPKY.

Buffy Fish Owl *Ketupa ketupu*

Khao Yai One, 8 February 1977 opposite the erstwhile TAT Restaurant (B. King, *in litt.*, November 1988).
One, 12 March 1982 (P.A. Coe, *in litt.*) Also seen daily the preceding week, (*per* P.A. Coe). One, 25 January 1992 (R. Wardle, *in litt.*)

Surprisingly, there are no records of either fish owl from any DPKY park or reserve other than Khao Yai which reflects an inadequate survey effort.

Savanna Nightjar *Caprimulgus affinis*

Pang Sida Recorded by S. Henson in August 1983 (A. Mauric, *in litt.*)

Though listed for Khao Yai by Flotow (1980) and claimed fom the headquarters area by various other observers, these records are regarded as unconfirmed since the distinctive whiplash territorial call of the species has never been heard. If the species occurs in the park it is liable to be found in drier, more open lowland areas around the park margins

Oriental Turtle Dove *Streptopelia orientalis*

Khao Yai The only sightings are one, 26 May 1984 (P. Bristow); two, 22 September 1988 (J.N. Dymond); one, 13 February 1996 (Gary Wiles) and one, 1 December 1999 (Yoav Perlman).

This species tends to inhabit more open woodlands and drier areas. It is surprising that there are no records for elsewhere in DPKY. The above records may perhaps be migrant birds since Deignan (1963) thought that migrant visitors occurred in the north of the country.

Pin-tailed Pigeon *Treron apicauda*

Khao Yai The status of this species in the park is unclear since the few records fall within the winter months, spanning the dates 25 October to 17 February (Kamol Komolphalin, *in litt.*). and could possibly be non-breeding visitors from further north. Not known from elsewhere in DPKY.

Slaty-legged Crake *Rallina eurizonoides*

Khao Yai	Listed by CDC (1989). The provenance of this record has not been traced.
Pang Sida	One found dead, 2 November 1984 (A. Mauric, in litt.).

Common Moorhen *Gallinula chloropus*

Khao Yai	A non-breeding visitor to the ponds of the plateau around the headquarters: earliest records one, 28 August 1983 (author) and 18 September (1993: A Pierce, *in litt.*).
Thap Lan	Listed by Mr. Pornchai Wisutatharn (*in litt.*).
Pang Sida	A few birds present on a lake at the extreme west of the park, 26 November 1993 (A. Mauric, *in litt.*)

Pintail Snipe *Gallinago stenura*

Khao Yai	4 on 7 September 1982 (R.S.E. Swanquist, *in litt.*) is the only record from the survey area, reflecting inadequate coverage.

Whimbrel *Numenius phaeopus*

Khao Yai	One on the former golf course, 8 September 1982 (R.S.E. Swanquist, *in litt.*).

A winter visitor and passage migrant, chiefly found on intertidal mudflats.

Spotted Redshank *Tringa erythropus*

Khao Yai	One apparently recorded (flew over) on 7 September 1982 (R.S.E. Swanquist, *in litt.*).

Green Sandpiper *Tringa ochropus*

Khao Yai	Listed as a vagrant by McClure (1974). One seen near the Training Center, 18 November 1994 (P. Svensson, *in litt.*)
Ta Phraya	A single bird seen on a small muddy patch by the roadside near the lower entrance to the Chong Takhieu Road, 10 and 12 September.

A winter visitor in small numbers, most common in the north of the country.

Pacific Golden Plover *Pluvialis fulva*

Khao Yai	One on 7 September 1982 (R.S.E. Swanquist, *in litt.*)

Red-wattled Lapwing *Vanellus indicus*

Khao Yai	A recent colonist to grassy areas around the park headquarters. This species was not listed by McClure (1974). The earliest record was a bird heard at night, 21 January 1991 (senior author unpubl. obs.). At the present time, there are several pairs around the headquarters area.

Red-wattled Lapwings occur widely in open grassy habitats throughout all DPKY reserves.

Oriental Pratincole *Glareola maldivarum*

Khao Yai — 40+ flew over, 8 March 1982 (G. Walbridge, *in litt.*)

This species of dry, open plains may be a passage migrant through DPKY. This is the only survey record.

Small Pratincole *Glareola lactea*

Thap Lan — Two birds were seen on the edge of a ploughed field on the shores of the Lam Plai Mat reservoir, outside the park boundary, UTM 033962, 21 December.

This species nests in colonies on riverine sandbanks and also occasionally on islands forming in seasonally dry reservoirs.

Whiskered Tern *Chlidonias hybridus*

Ta Phraya — A single bird seen on 13 and 14 September on a small reservoir outside the park boundary near the Chong Takhieu guard station. This is the only record for the survey area.

White-winged Tern *Chlidonias leucopterus*

Khao Yai — The only record for the park is a bird in "almost full winter plumage" seen hawking over the lake on 7 September 1963 (Dickinson and Tubb, 1964).

Black Baza *Aviceda leuphotes*

Present throughout all DPKY Reserves. The existence of resident birds, as well as non-breeding migrant visitors, is provided by sight records outside the migration/winter period from Sakaerat on 19 July 1981 (K. and P. Komolphalin, pers. comm) and a pair circling over forest at Pang Sida, 13 June 1992, one of which was carrying a frog (K. Komolphalin, *in litt.*). A single bird was also seen above the former TAT area, Khao Yai in June 2002 (author).

Resident birds tend to occur in open woodland, chiefly over lower elevations. Migrant birds occur in a wider range of habitats, including scattered clumps of trees in open country.

A flock of c. 1010 birds which passed overhead above the northern gate of Khao Yai, 30 October 1985 over a period of only 10 minutes, (author; unpubl. obs.), is clear evidence of substantial migration through DPKY.

Oriental Honey-buzzard *Pernis ptilorhyncus*

Sakaerat — A sighting of three over deciduous woodland on 17 July 1981 (author) may suggest the presence of resident breeders in addition to wintering birds.

Present in all DPKY reserves where, as elsewhere, it is one of the most frequently observed medium to large raptors. Passage migration of small numbers of Oriental Honey-buzzards has been observed in Khao Yai during October.

Short-toed Eagle *Circaetus gallicus*

Khao Yai	Sight record, February 1995 (B. Rabbitts, *in litt.*). This is the only record for NE Thailand.

The status of this species is very imperfectly known in SE Asia and possibly complicated by the possibility of confusion with the highly variable Oriental Honey-buzzard.

Pied Harrier *Circus melanoleucos*

Khao Yai	Single males, 12–14 October 1983 (C. Prentice); 27 September 1993 (A. Pierce) and 22 October 1990 (Kamol Komolphalin). One female or immature, December 1981 (C.S. Balchin, *in litt.*).

This species was first listed for Khao Yai by McClure (1974).

Japanese Sparrowhawk *Accipiter gularis*

Khao Yai	Three, 16 September 1984 (P. Alexander-Marrack, *in litt.*); one 23 October 1985 (E. Ebels, *in litt.*); one February 2000 (author). One, 1 September 1998 (Sopitcha Tantitadapitak, *in litt.*). One 29 November 1999 (Yoav Perlman, *in litt.*). Two to three *Accipiter* sp. seen per day in the headquarters area during 24–26 October 1991 appeared to be on migration, and were probably this species (author).
Sakaerat	Listed as present (authority uncertain)
Pang Sida	One, 15 December 1992 (Krisanapol Wichapant and Somyod Ngowattana, *in litt.*)
Ta Phraya	One or two *Accipiter* hawks moving west along the Phanom Dongrak scarp were seen on eight days. Most such sightings are probably referrable to this species.

This species may be commoner than realised because of difficulty in distinguishing it from immatures of other Accipiter species. It seems to be scarce in winter and commoner during spring and autumn passage. A specimen in the private collection of the late Dr. Boonsong Lekagul was collected from Pak Chong on 17 November 1954.

Besra *Accipiter virgatus*

Khao Yai	One chasing a Greater Flameback, 16 January 1990 (Martin Goodey, James Wolstencroft). Listed in addition by other observers.
Thap Lan	Listed as present by Mr. Pornchai Visuthatarn (*in litt.*).
Pang Sida	Reported by S. Henson for July 1993 (A. Mauric, *in litt.*). The species was also claimed by Krisanapol Wichapant and Somyod Ngowattana (*in litt.*) for 17 December 1992

In no cases were details provided sufficient to preclude the possibility of confusion with other *Accipiter* spp. This is perhaps the most problematical *Accipiter* to identify, since the adult plumages somewhat resemble immature plumages of similar species such as Shikra *Accipiter badius* and Japanese Sparrowhawk. Confusion with Crested Goshawk *Accipiter trivirgatus* remains another possibility. However, the species is listed for the eastern plateau by Deignan (1963) and is therefore almost certain to occur in DPKY.

Booted Eagle *Hieraaetus pennatus*

Khao Yai	One dark morph, 15 March 1982 (G. Walbridge, *in litt.*)

This species is a scarce winter visitor or passage migrant with most records from the central plains.

Changeable Hawk Eagle *Spizaetus cirrhatus*

Khao Yai	Listed as present (authority uncertain)
Sakaerat	Listed by Ngampongsai and Lauhachinda (1988).
Ta Phraya	A pale morph in open woodland along the edge of the scarp at Chong Takhieu, 13 September was the only sighting during the survey.

Known also from Pang Sida. This species may be mainly confined to foothills and lower elevations, and is possibly rarer than previously thought. A re-examination of records would be appropriate. So far as known, all records from DPKY are of pale morph birds.

Collared Falconet *Microhierax caerulescens*

Khao Yai	The species was formerly present in lowland, presumably open woodland along the Thanarat Road (Dickinson, 1963) an area from which it has since disappeared. The only other record was of a bird seen in flight over tall lowland forest and open areas near the KY 3 (Pong Chanuan) Guard Station during the present survey on 11 November 1999.
Sakaerat	Listed by Ngampongsai and Lauhachinda (1988).
Thap Lan	One at Sap Pet, 20 December.

Scarce in DPKY; largely restricted to more open forest.

Little Grebe *Tachybaptus ruficollis*

Khao Yai	Not recorded during the present survey. The only record for the park is three juveniles present on a small pond north of the former TAT complex on 7 and 8 September 1982 (R.S.E. Swanquist, *in litt.* to PDR).
Thap Lan	Listed by Mr. Pornchai Wisutatharn (*in litt.*).
Ta Phraya	Seen with two small young on pools at Sa Saam, 11 and 12 September 1999.

Populations in DPKY are small and have little relevance in the national context.

Little Cormorant *Phalacrocorax niger*

Khao Yai	A rare visitor to the pond areas around the headquarters. One on the TAT Pond, 22 January 1991.
Thap Lan	Listed for the park by Mr Pornchai Wisuthatarn.

Grey Heron *Ardea cinerea*

Khao Yai	One, 26 October 1985 (Enno Ebels, *in litt.*)
Thap Lan	Listed by Mr. Pornchai Wisutatharn (*in litt.*)
Ta Phraya	Listed by J. Nabhitabhata for a reservoir in the vicinity of the park, November 1998.

Purple Heron *Ardea purpurea*

Khao Yai	One at Nong Pak Chi, 26 October 1984 (A. van den Berg, *in litt.*)
Thap Lan	Listed by Mr. Pornchai Wisutatharn (*in litt.*)

Chinese Pond Heron *Ardeola bacchus*

Ta Phraya	Over 200 moving west and south-west in small flocks along the Lam Saton valley, 18 September 1999, seemed to be evidence of passage migration.

Present in all protected areas of DPKY.

Black Bittern *Dupetor flavicollis*

Khao Yai	One, 31 October 1991 (P. Shepherd, *in litt.*).

Expected to be an occasional passage migrant through DPKY, with breeding visitors perhaps being found in the wet-season in marshy areas around DPKY margins.

Blue-winged Pitta *Pitta moluccensis*

Khao Yai	Singles January 1982 (D. Johnston, pers. comm); 22 April 1989 (Frank Lambert, *in litt.*) and 26 April 1989 (Verity Picken, *in litt.*). One immature 12 August 1992 and one adult 13 August 1991. Breeds at lower elevations, (heard at Khao Luuk Chang, 18 May 1985, author). A specimen was also taken at Pak Chong, 29 April 1966 (Dickinson and Chaiyaphun, 1968).
Pang Sida	Heard, 29 May 1992 (Pranee Sachakamol, *in litt.*).

This species is chiefly found in the lower elevation disturbed evergreen and mixed deciduous forest, including areas dominated by bamboo and can be expected to be present as a breeder at low elevations in all DPKY reserves. Birds around the headquarters area of Khao Yai were probably migrant individuals. The single midwinter record from Khao Yai is highly unusual, since this species migrates to the ever-wet tropics in the non-breeding season. For this reason it was not detected during the autumn/winter 1999 survey.

Tiger Shrike *Lanius tigrinus*

Khao Yai	Two, 30 April 1987 (G. Speight, D. Pearse, pers. comm.)
Sakaerat	Listed as present (Wachara Sanguansombat, *in litt.*)
Pang Sida	One record; S. Henson, on 2 September 1993 (A. Mauric, *in litt.*)
Ta Phraya	Two, September 1999 (this survey)

This species is a spring and autumn passage migrant. Increased observations during these times would probably yield many more than have so far been recorded.

Slender-billed Oriole *Oriolus tenuirostris*

Khao Yai	H.E. McClure's notes tentatively identify a juvenile bird seen at Haew Suwat on 23 January 1970 as this species. However, McClure's (1974) paper treats all oriole sightings as *Oriolus* spp., so the record is highly doubtful. Slender-billed Oriole was listed for Khao Yai by Flotow (1980) and by M Hunter, *in litt.* (one, 22 December 1998). A single adult seen at the firestation viewpoint, Khao Yai, on 14 February 2003 (author) showed the characteristics of this species.
Pang Sida	10–15 birds claimed near Km.15 on 17 December 1992 (Krisanapol Ichapant and Somyot Ngowattana, *in litt.*) would seem an unusually large number of a bird which should at most be a scarce winterer in DPKY. This record is regarded as provisional.
Ta Phraya	Listed by J. Nabhitabhata (*in litt.*) without comment.

Slender-billed Oriole is tentatively added to the DPKY avifaunal list as a scarce non-breeding visitor on the basis of the Khao Yai sightings. It is recognised that many records remain unproven due to the considerable difficulty in separating this species from the closely similar, and commonly wintering, Black-naped Oriole *O. chinensis*. Slender-billed Oriole breeds in NW Thailand and in the Dong Phaya Fai range of NE Thailand south as far as Phu Khieo Wildlife Sanctuary, in open forest usually at or above the montane transition. It has also been recorded in Kaeng Krachan National Park, SW Thailand as a winter visitor (author's own data).

Black-hooded Oriole *Oriolus xanthornus*

Khao Yai	H.E. McClure's notes mention a juvenile on 23 January 1972 at Haew Suwat. However, the record is followed with a question mark and McClure's (1974) paper treats all orioles as *Oriolus* spp., so the record was presumably reconsidered by the author.
Sakaerat	Present in dry dipterocarp woodland
Thap Lan	Present in dry dipterocarp woodland at Sap Sadao, recorded on 25% of lists (seen on 3 days; 2–6 per day).
Pang Sida	Listed by RFD National Park Master Plan

In continental Thailand this species is mainly or entirely limited to deciduous woodland.

Maroon Oriole *Oriolus traillii*

Khao Yai	First recorded by Dickinson and Tubb (1964): a female on 11 January 1964. There have been subsequent sight records, but details are not available.

Although nominate *A. t. traillii* breeds in northern Thailand, winter visitors are probably of the Southern Chinese breeding race, *O.t. nigellicauda*. A specimen of the latter (erroneously listed as *O.t. robinsoni* in Lekagul and Cronin (1974) and Lekagul and Round (1991) was collected at Khao Soi Dao, Chnathaburi province, SE Thailand (Round and Nadee, 2001).

Indochinese Cuckooshrike *Coracina polioptera*

Sakaerat	Listed by TISTR (2000), where it should be expected to occur in dry dipterocarp woodland.

Thap Lan	Common in dry dipterocarp forest at Sap Sadao, though not as yet reliably recorded elsewhere in DPKY.

Indochinese Cuckooshrike was listed for Khao Yai by McClure (1974), by Flotow (1980) and in CDC (1989). However, previous identifications are unreliable, and probably based on erroneous fieldmarks, such as amount of white in the wing. Evidence for its occurrence anwhere in Khao Yai remains lacking. On current knowledge, Indochinese Cuckooshrike is restricted to dry dipterocarp and the more open mixed deciduous forests, primarily of the lowlands, but occasionally up to the montane transition.

Ashy Drongo *Dicrurus leucophaeus*

Recorded throughout DPKY, where dark-plumaged birds (presumably *D.l. bondi*) were possibly resident at lower elevations. Although dark-plumaged Ashy Drongos were present around Khao Yai National Park headquarters, where a specimen was assigned to the race *bondi* by Dickinson (1968), they did not appear to be resident there and were recorded solely during the winter months (author, G. Gale, own data). This raises the possibility that some or most dark-plumaged birds in parts of DPKY are actually *D.l. mouhoti*, which breeds in NW Thailand and is said to winter widely elsewhere (Deignan, 1963). These two races are very similar and some individuals may be inseparable, even on measurements. Additionally, birds showing the characteristics of both pale, longer-distance migrant races, *D. l. leucogenis* and *D. l. salangensis* were also found in DPKY, the latter both around Khao Yai HQ and at montane elevations of Khao Khieo. One *D. l. leucogenis* was found in dry dipterocarp at Sap Sadao, Thap Lan and one *salangensis* at Sap Pet, Thap Lan.

Crow-billed Drongo *Dicrurus annectans*

Khao Yai	Singles, 16 September 1984 (Peter Alexander-Marrack, *in litt.*) and 20 September 1993 (A. Pierce, *in litt.*). This species was not listed for the park by McClure (1974) and these appear to be the only records for which details are available.
Thap Lan	Listed by Mr. Pornchai Wisutatharn (*in litt.*)
Pang Sida	Listed by A. Mauric (*in litt.*, 1995).

Throughout most of the country, this species is a spring and autumn passage migrant. It winters chiefly in the peninsula. The scarcity of records from Khao Yai is surprising and almost certainly due to insufficient coverage of the park during the spring and autumn migration. It would be expected in both Sakaerat and Ta Phraya.

Hair-crested Drongo *Dicrurus hottentottus*

Recorded in all areas of DPKY visited during the survey. It appeared most frequent on the summit ridge of Khao Rom, Khao Yai, where recorded on 60% of lists. This was a somewhat anomalous finding, since breeding Hair-crested Drongos are most frequent at lower elevations, in semi-evergreen and mixed deciduous forest. However, the species is also common around the headquarters area of the park during the winter months, where large numbers feed on nectar in flowering *Erythrina*, *Acrocarpus* and other trees. McClure (1974) presented seasonality data on Hair-crested Drongos for the headquarters area of Khao Yai, showing many fewer birds were present during April through to September than at other times. He attributed this to nomadism, presumably of birds moving up from lower elevations, though did not discuss the possibility that resident *D.h. hottentottus* might be joined by migrant *D.*

h. brevirostris, a winter visitor from S. China, as seems likely. Both forms are apparently known from the eastern plateau (Deignan, 1963).

Common Woodshrike *Tephrodornis pondicerianus*

Sakaerat Listed by Ngampongsai and Lauhachina (1988).
Thap Lan Present in dry dipterocarp woodland around Sap Sadao Guard Station.

Common Woodshrike was listed for Khao Yai by Flotow (1980) but there have been no subsequent records and the species is thought unlikely to have occurred. Its core habitat is dry dipterocarp woodland of plains and foothills. The absence of more recent records from Sakaerat is surprising.

White-throated Rock Thrush *Monticola gularis*

Thap Lan A female bird feeding along the road between the Khlong Namman and Lam Praeng Guard Stations on 24 December 1999 was an addition to the park list.

With a great many records from both Khao Yai and Sakaerat, where it is an annual winter visitor, this species should occur throughout all areas of DPKY. It inhabits small clearings and forest understorey in evergreen forest, and is also found in dry dipterocarp woodland. Away from the east and south-east of the country, it is uncommon or rare.

Blue Whistling Thrush *Myophonus caeruleus*

Khao Yai Both wintering black-billed birds, *M. c. caeruleus*, and yellow-billed birds, including both resident *M.c. eugenei* and possibly also wintering *M.c. temminckii*, are present in the park across a wide range of elevations. Nest-building was noted on 24 April 1989 (Mongkol Wongkalasin, pers. comm.).
Thap Lan Up to three yellow-billed birds along the Lam Chae, 18–20 December 1999.
Pang Sida Listed by RFD Master Plan.

The absence of records for Sakaerat and Ta Phraya is surprising. Wintering birds, at least, might be expected at the former site while residents might be expected to occur at Ta Phraya in association with rocky outcrops.

Siberian Thrush *Zoothera sibirica*

Khao Yai A spring and autumn passage migrant. One male, Mo Singto, 14 April 1983 (P.D. Round, unpubl. obs.); two (male and female), 30 March 1988 (R. Webster *in litt.* to PDR). One female seen on the summit of Khao Rom, 7 November 1999.

Japanese Thrush *Turdus cardis*

Khao Yai A sight record of a male in evergreen forest on the Mo Singto trail in December 2002 (Kamol Komolphalin, pers. comm.) constitutes only the third record for Thailand.

Sakaerat A first-year male picked up dead at Sakaerat Environmental Research Station on December 1998 was the second record for Thailand. The specimen is stored at TISTR. The first record was from Doi Inthanon (Nadee, 1999).

Dusky Thrush *Turdus eunomus*

Khao Yai A single bird was apparently photographed near the old Tourism Authority Complex on 15 December 1996 (*Photo and Life Exposure* Vol. 5, No. 48).

This is the first record of Dusky Thrush away from the (chiefly) montane zone of the north-west where it is an irregular and irruptive winter visitor.

Ferruginous Flycatcher *Muscicapa ferruginea*

Khao Yai One on the Mo Singto Trail along a streamside, 14 April 1983 (author); one 11 December 1999 (P. Ericsson, *in litt.*).

Sakaerat Listed by Wachara Sanguansombat (*in litt.*).

This species should be a frequent spring and autumn passage migrant through DPKY.

Yellow-rumped Flycatcher *Ficedula zanthopygia*

Khao Yai Listed by McClure (1974) for the months February, August and November. Adult males 11 April 1985 (Geoff Bateman, *in litt.*); 15 December 1984 (author), 23 September 1988 (J.N. Dymond, pers. comm.); 8 April 1992 (J.M. Day, *in litt.*); 30 April 1987 (G. Speight, D. Pearse, pers. comm.).

This species is a spring and autumn passage migrant. The two midwinter records are exceptional.

Mugimaki Flycatcher *Ficedula mugimaki*

Khao Yai Recorded most years, with records spanning the period 8 December to 8 April.

This species is a scarce winter visitor and passage migrant. Arrival in autumn seems to be much later than most other palearctic migrants.

Slaty-backed Flycatcher *Ficedula hodgsonii*

KhaoYai One (sex not noted), 15 April 1996 (H. Thorhauge Rask and E. Christopherson, *in litt.*).
Two males seen in montane forest by the viewpoint, Khao Khieo, 7 January 2003 (author).

This species, which is a relatively common winter visitor to montane forests of the north, was listed for Nakhon Ratchasima Province by Deignan (1963).

Blue-and-white Flycatcher *Cyanoptila cyanomelana*

Khao Yai	Listed by CDC (1989) from a sight-record near Khao Luuk Chang on 14 December 1988 (J. & J. Geeson,*in litt*..). A male was photographed at the Pha Kluey Mai campsite on 23 April 2001 (Nichaya Praditsup, pers. comm.) and another was seen near park headquarters on 29 March 2002 (Marc Guyt, *et al.*).
Pang Sida	Listed by a BCST group, 14–16 October 1994.

Corroborating details were not supplied for the first Khao Yai record and the Pang Sida record. However, this species is an expected late-autumn and spring passage migrant through eastern Thailand and so these, and suceeding records, have been allowed to stand. One further bird, an adult male, was reported from nearby wooded limestone country at Wat Tham Phra Photisat, Thap Kwang, Saraburi on 09 Match 2001 (M. Gottschling, *in litt.*)

Verditer Flycatcher *Eumyias thalassina*

Khao Yai	Present in all areas surveyed during November 1999. McClure (1974) recorded it in the headquarters area of the park from October through March, apart from a single record in July.
Sakaerat	Unaccountably not listed by Ngamongsai and Lauhachinda (1988) though considered as present by Wachara Sanguansombat (*in litt.*)
Thap Lan	Present in all areas surveyed, December 1999.
Ta Phraya	Listed by Nabhitabhata (*in litt.*) for November 1998. However, none was recorded during September 1999, suggesting that the species is a non-breeding visitor.

The pattern of records in DPKY is anomalous since it indicates that this species is a non-breeding visitor. Elsewhere, in most forested regions of the country, Verditer Flycatcher is resident.

Vivid Niltava *Niltava vivida*

Khao Yai	Single males, 22 February 1986, 21 February 1987 and 15 February 1991 (author, own observations).

The only confirmed records of niltavas for Khao Yai were this species. Both Rufous-bellied Niltava *N. sundara* and Fujian Niltava *N. davidi* have been claimed (see Appendix 2), but no details supplied.

Chinese Blue Flycatcher *Cyornis glaucicomans*

Khao Yai	One male on 25 February 1998 (P. Smith, unpublished trip report) is the only record of this species for any park in DPKY.

The species is a winter visitor, inhabiting lowland forest and woodland patches, with previous midwinter records from the Central Plains and south. It has been recorded more widely on autumn passage. It is often treated as conspecific with the resident Blue-throated Flycatcher *C. rubeculoides*. However the two taxa have different songs.

Tickell's Blue Flycatcher *Cyornis tickelliae*

Khao Yai	About 6 birds seen in association with stands of spiny, large-culm bamboo along the lower Lam Phraya Than, 19 November 1999. These are apparently the first confirmed records for Khao Yai. Claims of this species around the headquarters area seem all to be referrable to Hill Blue Flycatcher *C. banyumas*.
Sakaerat	Listed by Wachara Sanguansombat (*in litt.*).
Thap Lan	Listed by RFD Master Plan.
Pang Sida	Listed by S. Henson, July 1993 (A. Mauric, *in litt.*)

Grey-headed Flycatcher *Culicicapa ceylonensis*

Khao Yai	Listed for the headquarters area of the park for the months October to April, with (apparently) a single record during June (McClure, 1974). During the current survey it was found commonly in all areas covered.
Sakaerat	Listed by Ngampongsai and Lauhachinda (1988). Not recorded by the author in July 1981.
Thap Lan	Present in December 1999 and found in both the Lam Chae and Lam Praeng study areas.
Ta Phraya	Listed by Nabhitabhata (*in litt.*) for November 1998. However, none was recorded during September 1999, suggesting that the species may be a non-breeding visitor.

Grey-headed Flycatcher appears to be a non-breeding visitor to DPKY following a similar pattern to that shown by Verditer Flycatcher. As with that species Grey-headed Flycatcher is resident in most other forested regions of the country.

Rufous-tailed Robin *Luscinia sibilans*

Khao Yai	Records of singles from the Kong Kaeo, Mo Singto and Haew Suwat areas of the park headquarters on 24 December 1987 (Richard Thomas, pers. comm.); 23–24 December 1989 (Kamol Komolphalin; author); 22 January 1992 (R. Wardle, *in litt.*); 12 and 14 February 1993 (author); 27 November 1993 (J.N. Dymond, A. Pierce, *in litt.*).
Pang Sida	One 3–6 January 1996 (J.N. Dymond, *in litt.*)

This species is a scarce winter visitor to Thailand with a scattering of records from the north and north-east of the country, mostly at low to moderate elevations. It is presumably an annual visitor in small numbers to DPKY but it is skulking and hard to detect, and therefore overlooked.

Orange-flanked Bush Robin *Tarsiger cyanurus*

Khao Yai	An adult male of the long-distance migrant race *cyanurus* was photographed near the Kong Kaeo bungalows on 16 December 2001. (S. Klabdee, *in litt.*)

This is the only undoubted record for DPKY. The species was listed by many observers during the late 1970s and 1980s. However, all these earlier records are regarded as

unauthenticated, and possibly indicate confusion, by naïve observers, with either or both sexes of Hill Blue Flycatcher *Cyornis banyumas* or with female and immature Siberian Blue Robin *Luscinia cyane*.

Oriental Magpie Robin *Copsychus saularis*

Khao Yai Not listed by McClure (1974). One by park HQ, 25 February 1990 appears to be the first record. One male, 6 March, and a pair 8 March 1990, by the former TAT (R. Struve, *in litt.*) There are apparently no subsequent records from the headquarters area though the species is present around park margins.

Recorded in all DPKY reserves, where chiefly in open habitats such as lowland riparian margins, cultivation, *etc.*

Slaty-backed Forktail *Enicurus schistaceus*

Khao Yai Known only from the more mountainous, western portion of the park. None were recorded on apparently suitable habitat on the upper Lam Phraya Than, including the gorge. Its presence there cannot be ruled out as villagers described capturing streamside birds in nets and were possibly referring to forktails.
In March 2002, the author and Nichaya Praditsup estimated 11 pairs of Slaty-backed Forktails on approximately 12 km of the Lam Takhong River in the headquarters area of the park.

Apparently absent from DPKY east of Khao Yai. This species is primarily montane, preferring fast-flowing streams, but nevertheless occurs down to the level of the foothills in northern Thailand.

White-crowned Forktail *Enicurus leschenaulti*

Khao Yai One heard below summit of Khao Rom, 8 November 1999. Several pairs occur on forest streams near the park headquarters. One particular stream section, on the Mo Singto Nature Trail, has supported a pair continuously for c. 24 years. It generally seems to be scarce in the park, however.

The absence of records from DPKY other than Khao Yai is surprising and may merely be an artefact of coverage, since the species is found on small forest streams and might be expected to be present.

Pied Bushchat *Saxicola caprata*

Khao Yai Apparently a recent colonist to the park headquarters area, not listed by McClure (1974). One to two pairs have been present in grassy areas near park HQ since at least 2 October 1994. Recently fledged juveniles were seen on 18 April 1996 (E. Christophersen and H. Thorhauge Rask, *in litt.*); and a nest with three young on 30 April 1996 (Klos Bunthavee, *in litt.*).

	During the current survey, also recorded in lowland, open areas along the northern park boundary, at Pong Chanuan and Khao Phaeng Maa.
Sakaerat	Listed by Ngampongsai and Lauhachinda (1988).
Thap Lan	Common in dry dipterocarp woodland and disturbed areas around Sap Sadao and the northern border of the park.
Ta Phraya	Common in open woodland and cultivated areas outside the park headquarters. Its presence in dry, open areas near Aranyaprathet was first documented by Thonglongya (1966).
Pang Sida	Listed by A. Mauric.

Pied Bushchat is one of a suite of species inhabiting dry woodland and open areas in the west, north and north-east of the country.

Grey Buschat *Saxicola ferrea*

Khao Yai	A scarce winter visitor: single birds recorded near park HQ on 27 December 1964 (Dickinson, 1967) and on 5 January 1990 (T. Luyendijk, *in litt.*).

Purple-backed Starling *Sturnia sturnina*

Khao Yai	Not listed by McClure (1974) but nonetheless, apparently recorded from the park. A single bird was banded during 1971 (McClure and Leelavit, 1972). Banding records of some species cited in McClure and Leelavit (1972) may be unreliable due to misidentifications. Also, in some cases, (mostly in Bangkok) purchased cage birds were ringed and released and the locality recorded as the release site. Nonetheless, this record is retained because of the probability of Purple-backed Starling occurring as a passage migrant. In addition, the species was listed by Pilai Poonswad (*in litt.*), though no details were provided.

Chestnut-bellied Nuthatch *Sitta castanea*

Sakaerat	Listed by Ngampongsai and Lauhachinda (1988).
Thap Lan	Up to 5 seen daily in dry dipterocarp woodland at Sap Sadao where recorded on 29% of lists.

This species is confined to dry dipterocarp woodland of the lower hills and plains.

Yellow-vented Bulbul *Pycnonotus goiavier*

Khao Yai	One, 16 April 1996 (H. Thorhauge Rask and E. Christopherson, *in litt.* to PDR). This species was not listed by McClure (1974).
Thap Lan	Listed by Mr. Pornchai Wisutatharn (*in litt.*).
Pang Sida	Recorded July 1993 by S. Henson (A. Mauric, *in litt.*).

This species is scarce inland, apparently following the well-watered habitats of river valleys. It reaches up the Chao Phraya drainage as far as Nakhon Sawan, and has also been reported along the Mekong in S Lao PDR, opposite the Thai town of Khemmaraj (Evans, 2001); now recorded upstream almost to Vientiane (J.W. Duckworth *in litt.*, April 2004). Though

sometimes kept as a cagebird, natural dispersal or vagrancy can probably more likely account for its occurrence in DPKY. It can almost certainly be expected to be found along the southern margin of Khao Yai in Nakhon Nayok and Prachinburi Provinces.

Black Bulbul *Hypsipetes leucocephalus*

Khao Yai — An occasional winter visitor to the park. McClure (1974) recorded flocks of birds of one of the white-headed races *stresemanni* or *leucothorax* on at least three occasions during December to February. One was also seen on 15 December 1985 (N. Lavers, in *Bangkok Bird Club Bulletin* 3, no. 2, March 1986). One bird (race unspecified) was seen on 18 December 1981 (C.S. Balchin, *in litt.*)

Brown Prinia *Prinia polychroa*

Sakaerat — Present in open dry dipterocarp woodland where first recorded in July 1981. Fledged young were seen being fed in July and August 1999 (Sopitcha Tantitadapitak, *in litt.*)

Thap Lan — Common in grassy understorey of dry dipterocarp woodland at Sap Sadao where recorded on over half of lists

Ta Phraya — Present in open fire-damaged semi-evergreen or mixed deciduous woodland along the Lam Sathon Valley, east of headquarters, where recorded on 20% of lists. Present, but less common, in more disturbed habitats near village areas to the south.

This species is rather scarce nationally, being primarily restricted to dry dipterocarp woodland of the plains and foothills.

Japanese White-eye *Zosterops japonicus*

Khao Yai — Listed for the park on the basis of a sight record on 24 December 1989 (J.A. Wolstencroft, pers. comm.) Also claimed by C. Robson (*in litt.*) for December 1979 or January 1980. The species is a winter visitor to Thailand, though can be difficult to separate from the extremely similar Oriental White-eye unless extremely good views are obtained. These are the only records for the survey area.

Baikal Bush Warbler *Bradypterus davidi*

Khao Yai — Sight records from grassland near the park headquarters on 2 March 1984 (author) and 29 December 1985 (J.C. Eames). One heard in cultivation outside park boundary, near Takhian Ngaam, 13 November 1999.

Thap Lan — One heard calling in tall elephant grass along the riparian margin, Lam Chae, 18 December 1999.

Buff-throated Warbler *Phylloscopus subaffinis*

Khao Yai — A scarce winter visitor, known from only four records. It is listed for the month of April by McClure (1974) on the basis of a single captured and ringed bird. Singles were seen on 1–2 February 1987 (*Per*

Undeland *in litt.* to P. D. Round); on 27 November 1991 (A van den Berg, *in litt.* to P. D. Round) and on 10 December 1999 (this survey).

The records for which details are available were from scrubby areas near the Mo Singto Dam by the park heaquarters. This species is a winter visitor to (primarily montane) open scrubland in the north

[**Chinese Leaf Warbler** *Phylloscopus sichuanensis*]

Khao Yai One, 18 December 1981 (C.S Balchin, *in litt.*); one 29 December 1985 (Craig Robson, *in litt.*).

These sight records were listed as Lemon rumped Warbler *Phylloscopus proregulus*, *sensu* King *et al.* (1975). This taxon is now split into three species, Pallas's Leaf Warbler *P. proregulus*, Lemon-rumped Warbler *P. chloronotus*, and a third species *P. kansuensis* (Alström and Olsson, 1990; Alström *et al.*, 1997). However, the commonest form of 'lemon-rumped warbler' in Thailand is the newly described Chinese Leaf Warbler *Phylloscopus sichuanensis* Alström *et al.*, 1992, for which there is an undoubted record (a TISTR specimen) as close as Phu Khieo, Chaiyaphum (Round, in prep.) *P. proregulus* and *P. chloronotus* have only been recorded from the north-west where they are much less numerous than *P. sichuanensis*. On grounds of probability, therefore, the few birds seen in Khao Yai are provisionally referred to *P. sichuanensis*.

White-tailed Leaf Warbler *Phylloscopus davisoni*

Khao Yai First recorded for the park by the author: three on the summit of Khao Khieo, 20 July 1985. Common on the summit of Khao Rom in November 1999 (present on 2/3 of lists; up to ten per day).

The subspecies present in Khao Yai has never been determined. *P.d. davisoni* breeds in the north, while the subspecies in Khao Soi Dao, SE Thailand is thought to be *P.d. klossi*.

Omei Spectacled Warbler *Seicercus omeiensis*

Khao Yai Seen and heard daily on Khao Rom (maximum 12 per day) where recorded on 87% of lists. The species has also once been found at Mo Singto, c. 800 m, where greatly outnumbered by Plain-tailed Warbler.

Thap Lan One heard in the Lam Praeng catchment, c. 540 m elevation 23 December 1999.

Following Alström and Olsson (1999, 2000) and Martens *et al.* (1999) this species and the following species are now split from Golden-spectacled Warbler *S. burkii*, which is recognised as a complex containing six sibling species. All of the (at least four) species occurring in Thailand may be readily distinguished by call-note. *S. omeiensis* calls with a single low, quiet *chup* (occasionally *chup-up*). This species was not treated as distinct from Grey-crowned Warbler *S. tephrocephalus* ("*S. tephrocephalus* group 6", following Alström and Olsson 1999) by Round (2000).

Plain-tailed Warbler *Seicercus soror*

Khao Yai	Recorded around the headquarters, and along the Lam Phraya Than. Single birds heard just below the summit ridge of Khao Rom, > 1200 m elevation on 8 and 10 November 1999.
Thap Lan	Detected around the Lam Chae and near the Lam Praeng Guard station.
Ta Phraya	One heard on the scarp west of headquarters, c. 390 m elevation, 16 September 1999.

This is the commonest "Golden-spectacled Warbler" taxon at low to moderate elevations throughout DPKY and calls with a short *tsrit*. Dickinson (1968) listed two taxa of *Seicerus burkii*, "*distinctus*" and "*tephrocephalus*" for Khao Yai following examination of skins collected by Royal Forest Department. These will likely prove to correspond to the two species recorded during the present survey. However, no specimens of *Seicercus* from Khao Yai could be located among bird skins housed at DoNP by the author in 2000–2001 and these may now have been lost.

White-browed Shrike Babbler *Pteruthius flaviscapis*

Khao Yai	Recorded on the summit of Khao Rom during November 1999 (present on 27% of lists): at least two pairs seen.

Dickinson (1968) examined a female specimen from Khao Yai without being able to definitely ascribe it to any particular subspecies.

Chestnut-fronted Shrike Babbler *Pteruthius aenobarbus*

Khao Yai	One male and two females seen near Khao Rom summit on 7 November 1999.

This species was first reported from Khao Yai from the upper slopes of Khao Khieo, 11 June 1966 (Dickinson, 1967).

Purple-throated Sunbird *Nectarinia sperata*

Khao Yai	Present at low to moderate elevations (c. 400 m) along the Khlong Tha Dan, and possibly elsewhere in the south of the park, where first recorded February 1990 (author). There are also two (pre-1990) reports from the headquarters area of the park (D.A. Scott, M.P. Goodey, pers. comm.; I.S. Robertson, *in litt.*) where the species has not been since found.
Sakaerat	Reported as present by J. Nabhitabhata (pers.comm.) and also from 'dry evergreen' forest by Wachara Sanguansombat (*in litt.*)
Thap Lan	Listed by Pornchai Wisutatharn (*in litt.*). for palm-dominated 'forest', (probably close to the park headquarters) February 1998.
Pang Sida	One male, 28 January 1994 (Kant Ratanajun, *in litt.*)

Purple-throated Sunbird is chiefly found in low-lying areas of the south-eastern provinces and the peninsula. It favours scrub habitats and forest edge in the peninsula, though is more likely to enter closed forest in continental Thailand.

Olive-backed Sunbird *Nectarinia jugularis*

Khao Yai Listed by McClure (1974) as a vagrant. A substantial population became established in the headquarters area of the park in the 1990s, probably through dispersal along the disturbed habitats along the roadside.

Present in more open habitats in all parks/reserves in DPKY.

Purple Sunbird *Nectarina asiatica*

Khao Yai Not found during the current survey but listed by McClure (1974) as a vagrant.

Sakaerat Present in dry dipterocarp woodland (Wachara Sanguansombat, *in litt.*)

Thap Lan Present in dry dipterocarp woodland at Sap Sadao (one breeding plumage male and another male in immature/eclipse plumage on 16 December). This scarcity may be more apparent than real: the species is more detectable later in the season when more nectar-producing trees are in flower.

Pang Sida Listed as present by RFD Master Plan for Pang Sida 1993–1997.

This sunbird is normally found in the driest habitats, including dry dipterocarp and other open woodland and scrub.

Richard's Pipit *Anthus richardi*

Khao Yai One, 24 December 1998 (M. Hunter, *in litt.*) showed characters of this species, though was not heard to call. The record is not particularly surprising since this species is a fairly common winter visitor to Thailand. This is the only record from the survey area. However, it was formerly treated as conspecific with resident Paddyfield Pipit *A. rufulus* so older lists do not usually differentiate between the two.

Blyth's Pipit *Anthus godlewskii*

Khao Yai Known from a single bird present on grassland near the park headquarters 30 November to at least 2 December 1999 (Perlman, 2001). This is the only record for Thailand.

Red-throated Pipit *Anthus cervinus*

Khao Yai One, 24 October 1990 (T.D. Christensen, *in litt.*).

This is the only record for the survey area.

Common Rosefinch *Carpodacus erythrinus*

Khao Yai Listed for the park by CDC (1989). The basis for this is not now traceable. This winter visitor has been recorded in the west, south as far as Erawan National Park (Kanchanaburi); in the north-east, in

Phetchabun Province (Deignan, 1963) and south to Thung Salaeng Luang, Phitsanuloke Province (J.N Dymond, *in litt.*).

Yellow-billed Grosbeak *Eophona migratoria*

Khao Yai The only record of this migratory species for DPKY, and indeed, for all of Thailand is of two birds seen at Km 35, 2 km north of the park headquarters, 25 February 1980 (P. Poonswad and A. Tsuji). The birds were perched in bare tree branches along the roadside. Two photographs were taken at a range of about 30 m.

Chestnut Bunting *Emberiza rutila*

Khao Yai The only record is a male near the former Tourism Authority Headquarters, 6 February 1984 (author, own data). However, the species is a fairly widespread winter visitor to open forest and secondary growth of both lowland and montane elevations and further records from other DPKY parks should be expected.

Pang Sida Recorded by J.N. Dymond (*in litt.*) during 3-6 January 1996.

2.2 MAMMALS

2.2.1 Survey aim

To assess the conservation significance of the DPKY for large mammals.

2.2.2 Survey objectives

- To conduct baseline surveys for large mammals in all DPKY reserves.
- To collect information on status and distribution for Key Species of large mammals.
- To train Royal Forest Department staff in methods for assessing large mammal presence-absence and relative abundance.
- To assess major threats to large mammal communities and habitats, especially Key Species, and to provide recommendations for future management of DPKY reserves for the conservation of these species and habitats.

2.2.3 Survey areas

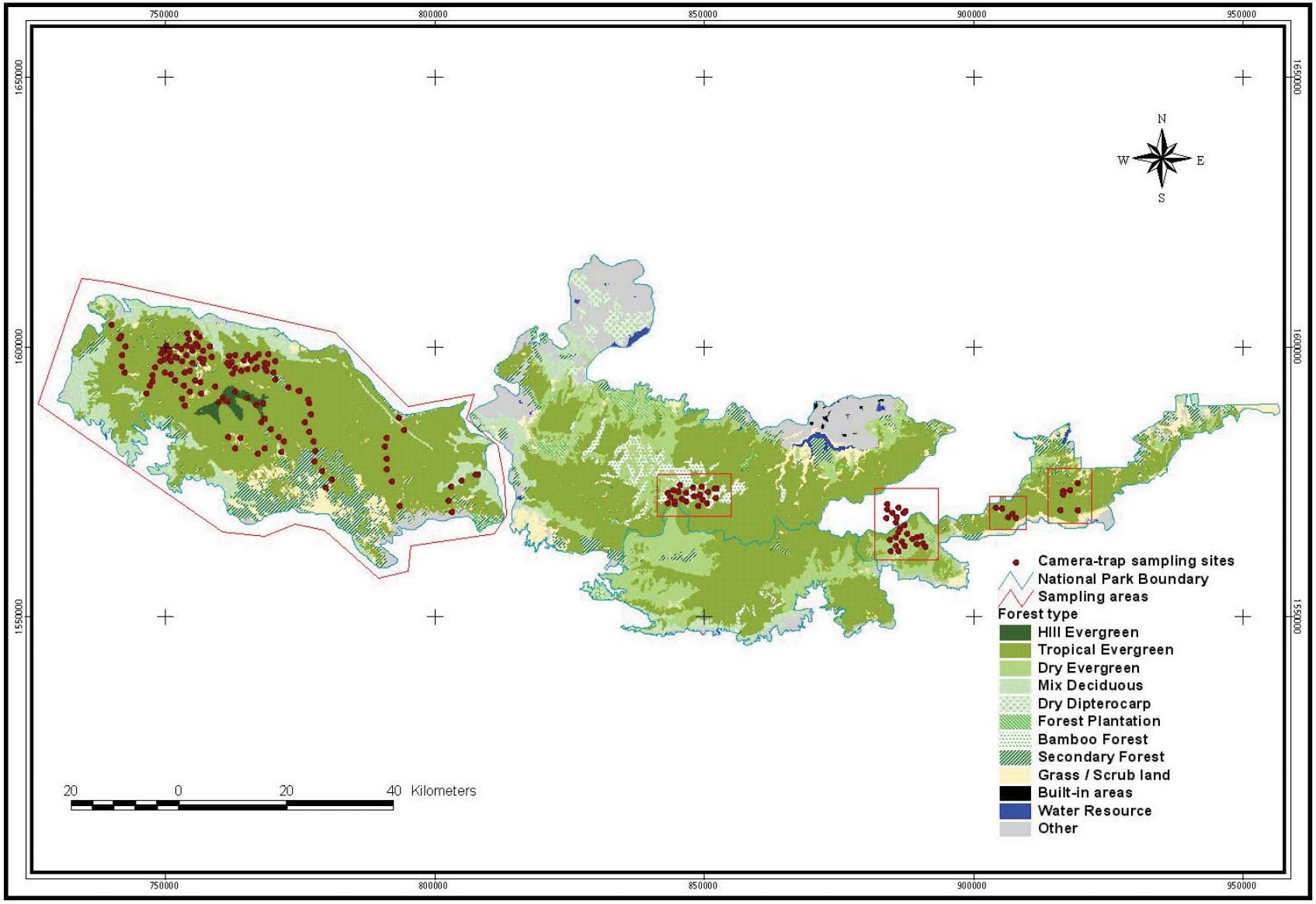
Mammal surveys were done at 13 sites across the 3 parks representing the suite of topographic, habitat and forest disturbance types. Survey areas are shown in Fig. 4.

Fieldwork was carried out in three phases and descriptions of these sites are as follows;

Ta Phraya National Park - June 8th to November 19th, 1998

SITE I Headquarters area - A western section in Sa Kaeo Province adjacent to Dong Yai Wildlife Sanctuary in the north, Thap Lan National Park to the north-west and Pang Sida National Park to the south-west. This includes parts of a sandstone

Figure 4. Survey areas for mammals in Dong Phayayen - Khao Yai protected areas.



plateau to the north of park headquarters (TA394629, 1:50,000 map series L7017, Sheet 5537 III, Ban Raboet Kham), and a 40 square kilometre lowland valley containing 10 year evergreen forest regrowth and thorn scrub stretching in an easterly direction from park headquarters to the Buriram-Aranyaprathet highway. The area is dissected by streams and contains mudholes and ponds which collectively provide a year-round water supply for large mammals and other wildlife. Villagers run herds of domestic cattle in the valley, while forests on the plateau are frequented by villagers but not grazed. A reafforestation project was underway in heavily degraded parts of the valley during the survey period.

SITE 2/3 Sa Saam and Pha Khanun - upland areas located in Sa Kaeo Province contain evergreen forest in good condition, interspersed with grasslands and swamps which are cultivated areas formerly occupied by Khmer villagers. In these old cultivations, rock cuttings for construction of buildings and religious monuments have created lenses which collect water during the wet season. Villagers visit this area during the dry season to collect non-timber forest products and Khmer artifacts. The area is accessible parts of which are occupied by the Royal Thai Army.

Surveys were not done in a narrow eastern section of Ta Phraya in Buriram Province, adjacent to Banteay Chmer Protected Landscape in Banteay Meanchey District, Cambodia. This is an elevated plateau containing disturbed evergreen forest and degraded lands converted for agriculture. The area is controlled by the Royal Thai Army and most parts of the area are inaccessible due to the presence of landmines and other unexploded ordinance.

Thap Lan National Park - September 15th to November 4th 1999

SITE 4 A rugged area in the centre of the park adjacent to Pang Sida National Park, and containing dense bamboo forest and some mixed deciduous forest. The area is crossed diagonally by a road that runs north-south linking the two parks. The area includes a range of elevations from 400-800m and includes two major drainages, the Huai Praeng and the Huai Buak. Substation no. 3 (UTM 0199240 1571838) provided a base for the mammal survey team.

Khao Yai National Park - January 12th to August 25th 2000

Three sites near the park headquarters, where tourist traffic is highest:

SITE 5 Khao Laem - a fire-maintained grassland and mountain 9km east of park headquarters.

SITE 6 Khlong E-Tow - a fire-maintained grassland 5km WNW of park headquarters

SITE 7 Mo Singto - a low-lying undulating forest area directly to the west of park headquarters.

Six sites in more remote parts of the park:

SITE 8 Upper Tha Dan Watershed - an area including montane and submontane evergreen forests of Khao Rom, and lower lying grassland areas known as Thung Ngu Luam.

SITE 9 Ban Sap Tai - an upland area accessed from the NW perimeter across rugged limestone terrain.

SITE 10 Sai Yai-Khlong Plakang - an upland area containing unlogged dry evergreen forest.
SITE 11 Nang Rong - a rugged area to the SW of park headquarters dissected by several steep drainages.
SITE 12 Prachantakham - remote, central forest area of the park containing massive evergreen forest.
SITE 13 Wan Luang - area at the far SE corner of the park containing disturbed evergreen, bamboo and lowland forest.

Surveys were not done at Pang Sida National Park due to logistical constraints and the fact the mammal fauna had already been documented (Mauric, 1996). Also the single study site at Thap Lan was very close to Pang Sida and habitats there were representative of those in the latter. Surveys were not done in Sakaerat Biosphere Reserve. Although the area is loosely connected to Thap Lan National Park via secondary forest and may serve as a refuge for some mammals, the large mammal fauna is mostly extirpated (TISTR, 2001).

2.2.4 Study methods

Several techniques were employed to elucidate the diversity, distribution and abundance of, and threats to, large mammals at the study sites in the DPKY. The focus of the survey effort was to determine presence-absence and, where possible, relative abundance of large non-volant mammals, especially species of special conservation concern (Duckworth and Hedges, 1998). Special attention was given to documenting sites at Ta Phraya, and remote sites at Khao Yai where no information on mammals was available. Due to time and personnel limitations, it was not possible to conduct thorough censuses for arboreal species, nor was it possible to conduct surveys for small (<1kg) mammals. However, diurnal arboreal species were noted where obvious by both mammal and bird survey teams.

Survey methods are described as follows:

Interview surveys - information on the potential presence-absence of large mammals and the location of critical habitats for wildlife may be obtained from interviews of local people (Rabinowitz, 1993b). To ensure quality of information gained from interviews standard questions must be used with the questions being delivered in a consistent and non-biased way. Interviews of forest guards, other officials and local people were conducted to gain preliminary information on the status of large carnivores and other mammal species considered threatened or endangered; tiger, wild cattle, elephant, bear, wild dog, and mammal species that are prey items for large carnivores; wild boar, red muntjac, sambar, primates, porcupine, serow and civets. Interviews were done at Khao Yai, Thap Lan and Taphaya National Parks.

Sign surveys - Direct surveys of tracks, scrapes, faeces and other signs were used to give information on the presence of large mammals. The reliability of sign surveys for detecting large mammals depends on the detectability of signs and the substrates in the study areas, and the skill of the observer (Wemmer *et al.,* 1996). Mammal signs may not be detectable during dry seasons or after heavy rainfall, and in places where leaf litter is dense or on rock or other hard substrates. Therefore sign surveys provide only a rough indication of the mammals present in an area. More rigorous methods are required to determine presence or absence for all species.

Ta Phraya - Searches for mammal signs were made on 8 June 1998 during daylight hours on a trail leading from park headquarters towards a sandstone escarpment to the north. A spotlight survey was done along the entrance road (13km) between the headquarters and 9km marker on the same day. Finally a survey using a 4WD vehicle was done in the middle section of the park along an unsealed road on June 9th. Spotlight surveys were done opportunistically between August 6–17 and November 18–19, 1998. Mammal signs were also detected in the course of conducting camera-trap surveys.

Thap Lan and Khao Yai - Sign surveys were conducted during the course of setting camera-traps.

Camera-trap surveys - Information from interviews and sign surveys suggested areas where large mammal activity was concentrated, and these areas were selected for camera-trap surveys. Infrared based camera-traps can be used for detecting large mammals, especially rare and cryptic species (Griffiths & Schaik, 1993; Wemmer *et al.*, 1996); Camera-trapping is non-invasive so behaviour patterns of wildlife are less influenced than survey methods involving capture. At each survey site camera-traps (Camtrakker™ Camtrak South Inc., Georgia USA) were employed to census large mammals. These devices incorporate a passive infrared sensor which detects a differential in heat and motion and automatically records animals or humans passing the unit by taking a photograph. Time and date are recorded on the film.

Two survey designs were used with camera-traps (Lynam *et al.*, 2001). Firstly, in some places, surveys were concentrated in 10 x 4 km plots. Camera-traps were placed at predetermined random UTM locations and spaced 1-2 km apart in alternate 1 km^2 grid squares within the plot. Global Positioning System (GPS) devices were used to navigate to the random locations and camera-traps were set within 100 m of the point on trails or roads. Random placement of traps allows for direct comparison of mammal diversity indices between sampling locations and sites. This was called the *plot-based survey design*. Secondly, in other places, camera-traps were deliberately placed along major trails and roads, streambeds and ridges where wildlife sign was detected or where mammals were thought to be moving. Once again traps were spaced at least 2 km apart. This *trail-based survey design* was employed to maximize the probability of capture of large mammals, especially large carnivores.

At some sites where large felids were expected, some camera-traps were set up on opposite sides of a trail or road. This was done to record the coat patterns on left and right sides of an individual which facilitates the identification of individuals.

Camera-traps were set to operate for 30-40 days. Information on wildlife and human activity or "traffic" was obtained. An index of relative abundance of large mammals was capture rate (RAI) where RAI = no. photographic records ("captures") /100 camera-trap nights of sampling. Camera-traps were set to record photographs of wildlife passing along trails 24 hours per day.

Site specific details of survey are as follows:
Ta Phraya - Camera-traps were placed in three areas in the park;

1. Ta Phraya NP headquarters and entrance road; ten camera-traps in a 10 x 2 km plot in the western section near park headquarters between 8 August and 13 September, 1998. The survey was repeated from 11 November to 21 December.
2. Six traps were placed in degraded forest east of park headquarters north and south of the entrance road near the Km 9 marker from 10 October to 18 November. Traps were placed to record Gaur and Banteng which were reported frequently from the area.
3. Seven camera-traps in a 24 km^2 plot in the middle section of the park near Sa Saam grassland from 15 September to 7 October. Five traps in a mixed forest/grassland area locally known as Pa Khanun from 9 October to 19 November. At Sa Saam and Pa Khanun cameras were placed along trails near water sources in a trail-based arrangement.

Thap Lan

1. Camera-traps were established at 20 random locations and 4 "checkpoints" inside a 10 x 4 km plot straddling an access road that cuts through the middle of the park, and extends to the south into Pang Sida National Park. Tiger sightings and tracks were regularly reported along this road.

Khao Yai

1. Khao Laem and Khlong E-Tow - Camera-traps were established at 20 random locations and 4 "checkpoints" inside 10 x 4 km plots in these two areas. Tiger, Gaur, Elephant and Dhole were reported frequently from these areas.
2. Mo Singto/Upper Tha Dan Watershed/Ban Sap Tai/Nang Rong/Sai Yai Prachantakham /Wan Luang - Camera-traps were placed along major trails and roads (trail-based survey design).

2.2.5 Results of survey

Overview

A Total of 60 species of large mammals are known from DPKY.

- 46 species are known for Khao Yai National Park
- 35 species are known for Sakaerat Biosphere Reserve
- 44 species are known from Thap Lan National Park
- 51 species are known for Pang Sida National Park
- 23 species are known from Ta Phraya National Park

Differences in species number do not necessarily reflect differences in mammal richness because survey efforts were different among sites.

Twenty-four key species of mammals known or likely global or national conservation concern have occurred in DPKY.

Key Species of mammals associated with the semi-evergreen forest block that is the dominant habitat type in the DPKY are Pileated Gibbon *Hylobates pileatus*, Elephant *Elephas maximus*, Gaur *Bos gaurus*, Tiger *Panthera tigris corbetti*, Clouded Leopard *Neofelis nebulosa*, Asian Golden Cat *Catopuma temmenckii*, Marbled Cat *Pardofelis marmorata* and Southern Serow *Capricornis sumatraensis*.

Another Globally Threatened species, Banteng *Bos javanicus*, was found to occur in association with lowland dry dipterocarp and other deciduous habitats around the margin of DPKY, especially near the northern border of Thap Lan National Park, in Sakaerat Biosphere Reserve, and around the margins of Ta Phraya National Park. Bantengs occur in scattered small populations within the DPKY but because of the extremely limited areas of plains-level deciduous woodland remaining nationwide, these populations are highly significant.

Preamble

The Results section is divided into two sections: Opportunistic observations and Species Accounts.

Opportunistic observations. These observations were made by the bird survey team and are reported here.

Khao Yai National Park (5–21 November, 1999). Observations of significant mammals were made at at four discrete sites in Khao Yai (Khao Rom, KY3, upper Lam Phraya Than, and lower Lam Phraya Than) during bird surveys in November 1999

Khao Rom. There was a very high level of use by large game animals, principally Gaur *Bos gaurus* and Wild Pig *Sus scrofa*, and the ground was heavily trampled along game trails. There were some open grassy mineral licks or wallows.

KY 3 (Ban Pong Chanuan/Ban Takhian Ngam). Carnivore droppings, possibly Golden Jackal *Canis aureus* or Dhole *Cuon alpinus* (thought not to be domestic dog because of the large proportion of hair in the dropping), were seen on the laterite boundary road; both cream and black-and-white morphs of *Callosciurus finlaysoni*, one *Tamiops* sp. and a *Tupaia belangeri* were seen.

Upper Lam Phraya Than. Throughout most of the area, there were very few mammal tracks. These included a few wild pigs and one bear paw-print, but no other large carnivores or deer. Only one group of Pileated Gibbons *Hylobates pileatus* was heard during the four days spent in the area. A well-used Gaur trail was found on Khao Khat, descending into the lower Lam Phraya Than Valley. Wild Pig tracks were also frequent.

Lower Lam Phraya Than. Gaur tracks extended down the hills to the upper reaches of the stream. Tracks of wild pigs, Lesser Mouse-Deer *Tragulus javanicus* and East Asian Porcupine *Hystrix brachyura* were also found.

Thap Lan National Park (13–24 December, 1999)

Sap Sadao. Tracks of wild pigs, Common Barking Deer *Muntiacus muntjak*, probably Small Indian Civet *Viverricula malaccensis* and a large civet, *Viverra zibetha* or *V. megaspila*, were noted.

Lam Chae/Sap Pet. The area appeared moderately rich in larger mammals, with many Sambar *Cervus unicolor* tracks, wild pig tracks and a few barking deer tracks. One set of Gaur tracks was seen. A major elephant trail descended from the hills to the south and east

to two mineral licks near Sap Pet, near the confluence of the Lam Praeng with the Lam Chae. A possible bear paw-print, a large cat paw-print and some probable Dhole prints were found. Pig-tailed Macaques *Macaca nemestrina* were also found. One Pileated Gibbon group was heard on the northerside of the valley.

Lam Praeng. One elephant was seen; there was a high frequency of sambar tracks and a mineral lick in the lower-lying part of the area bore evidence of wild cattle tracks, probably Banteng. Many carnivore scats, possibly Dhole, were seen along the road.

Ta Phraya National Park (8–19 September, 1999)

HQ Valley. This area was frequented by large mammals, including, reportedly Banteng *Bos javanicus*. Wild cattle tracks were seen during the day and one or two animals heard snorting at night near the road.

Lam Saton. Large mammals make frequent use of the upper valley one to two km west of the westernmost houses, since gaur tracks and lying places were seen among grasses in the valley bottom, close to the Lam Saton.

Chong Takhieu Scarp. One group of Pig-tailed Macaques, a *Ratufa bicolor* and both *Callosciurus caniceps* and *C. finlaysoni* were present.

Sa Saam. One barking deer was heard, and tracks seen at one location. Lesser Mouse-Deer tracks were seen at two locations. Bear claw-marks were seen on trunks at two locations, one fresh and one old. One to two month-old wild cattle tracks were seen at one location. Four *Callosciurus* calls were heard, but generally even signs of smaller wildlife were very sparse.

Gully area west of headquarters. Wild cattle (probably Gaur) tracks were seen at low density in the forest. There was also a low density of wild pig and barking deer tracks, and one old elephant dung.

Key species accounts

Records for Key Species obtained during the present survey from the three parks covered (Khao Yai, Thap Lan and Ta Phraya) are given along with previous records known or reported, published and unpublished, for Pang Sida National Park. The provisional list of mammal species is presented in Appendix IV. Distributions of large mammals, including Key Species, in sample areas of DPKY reserves are shown in Figs 5-11. Boundaries of sample areas are indicated.

Abundance categories

Using camera-traps, the frequency of detection scaled for sampling effort gave a relative abundance index (RAI) i.e. no. detections per 100 trapnights for some species. RAI was categorized as very low (<1.0 detections/100 trapnights), low (1-4.9 detections/100 trapnights), medium (5-9.9 detections/100 trapnights), high (10-19.9 detections/100 trapnights), or very high (>20 detections/100 trapnights). Mean and standard errors for RAI are given for species recorded by camera-trapping.

Figure 5. a. Relative abundance and distribution of felids from camera-trapping in Khao Yai National Park.

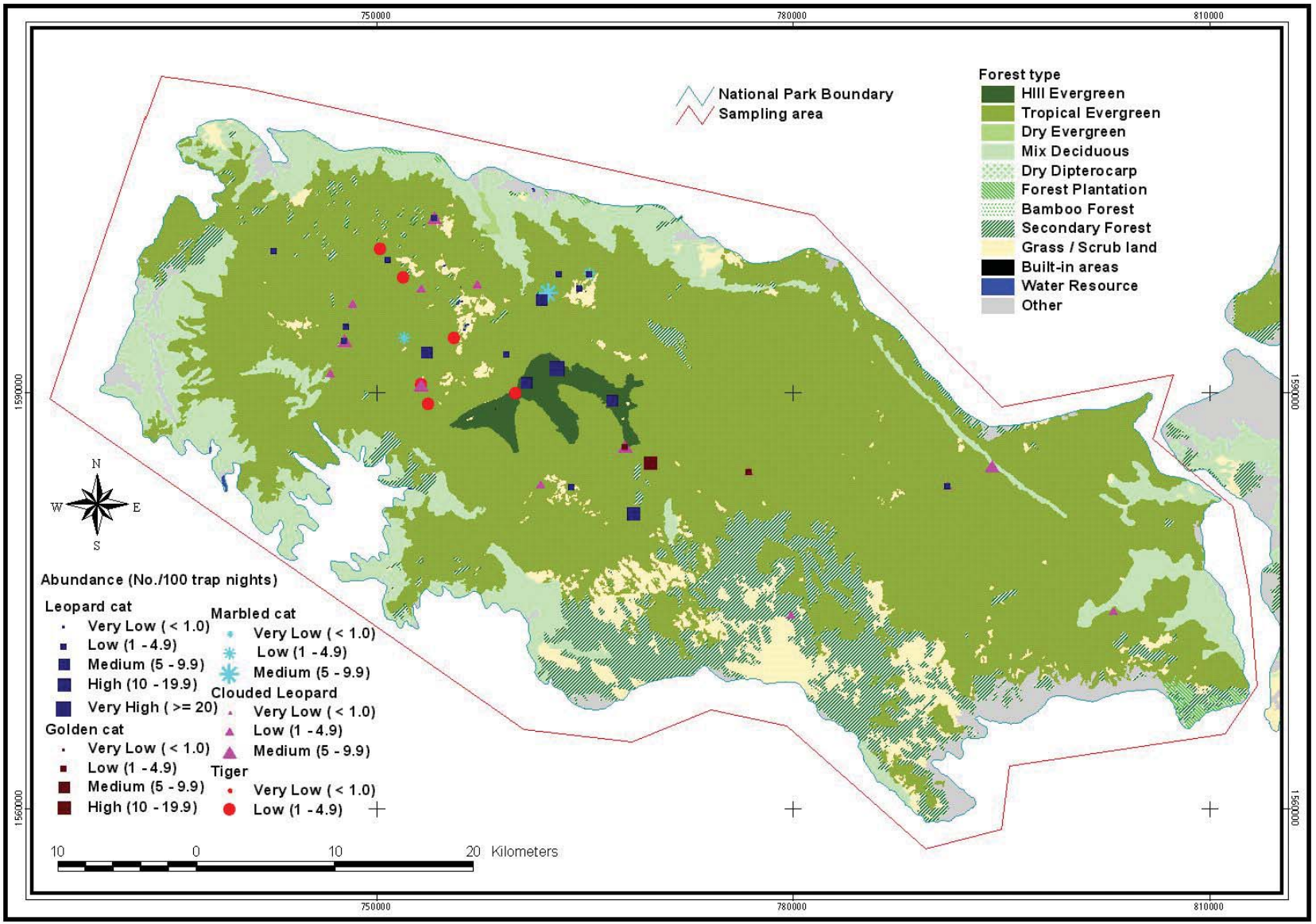


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Figure 5. b. Relative abundance and distribution of felids from camera-trapping in Thap Lan and Ta Phraya National Parks.

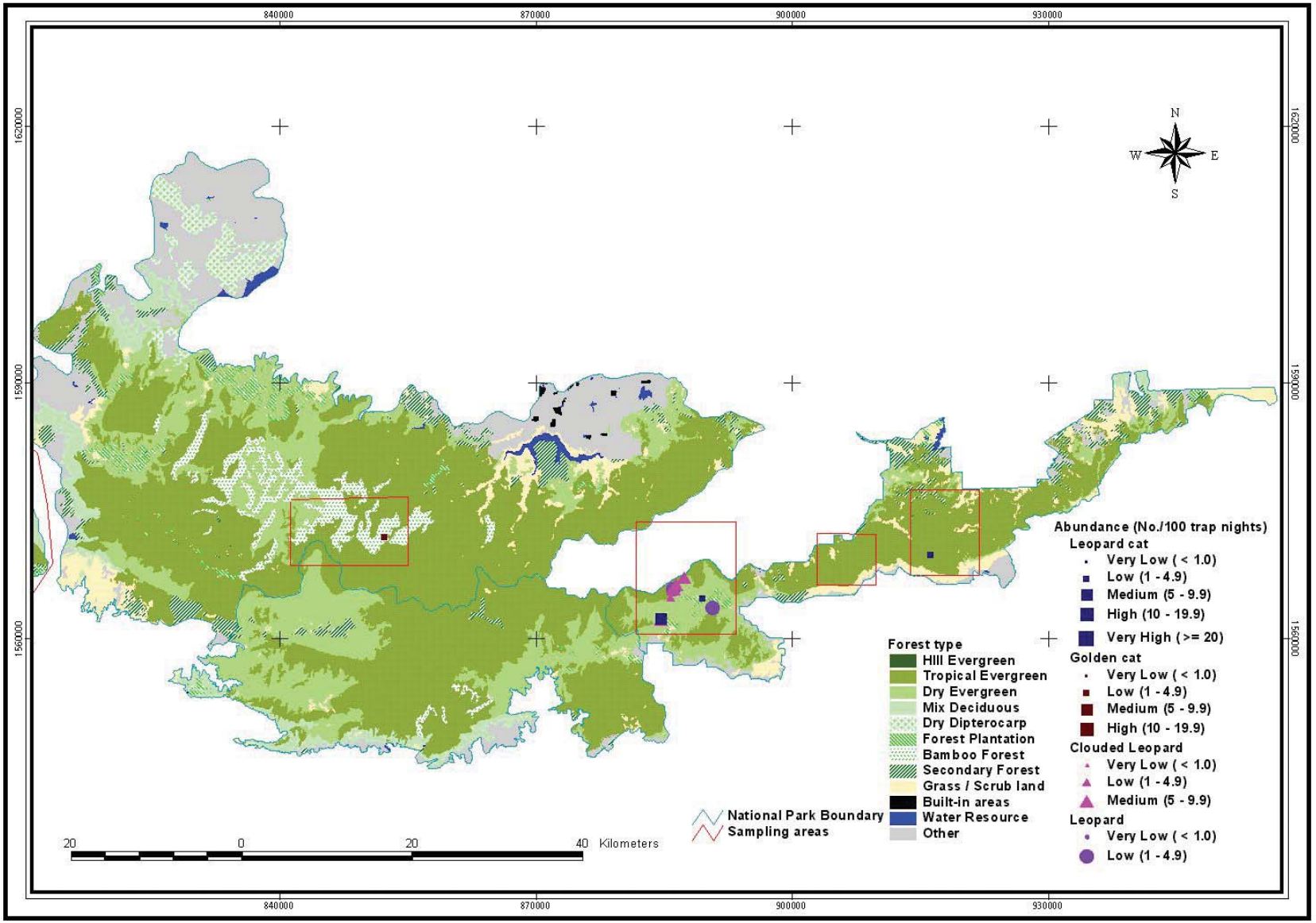

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Figure 6. a. Relative abundance and distribution of bears and dholes from camera-trapping in Khao Yai National Park.

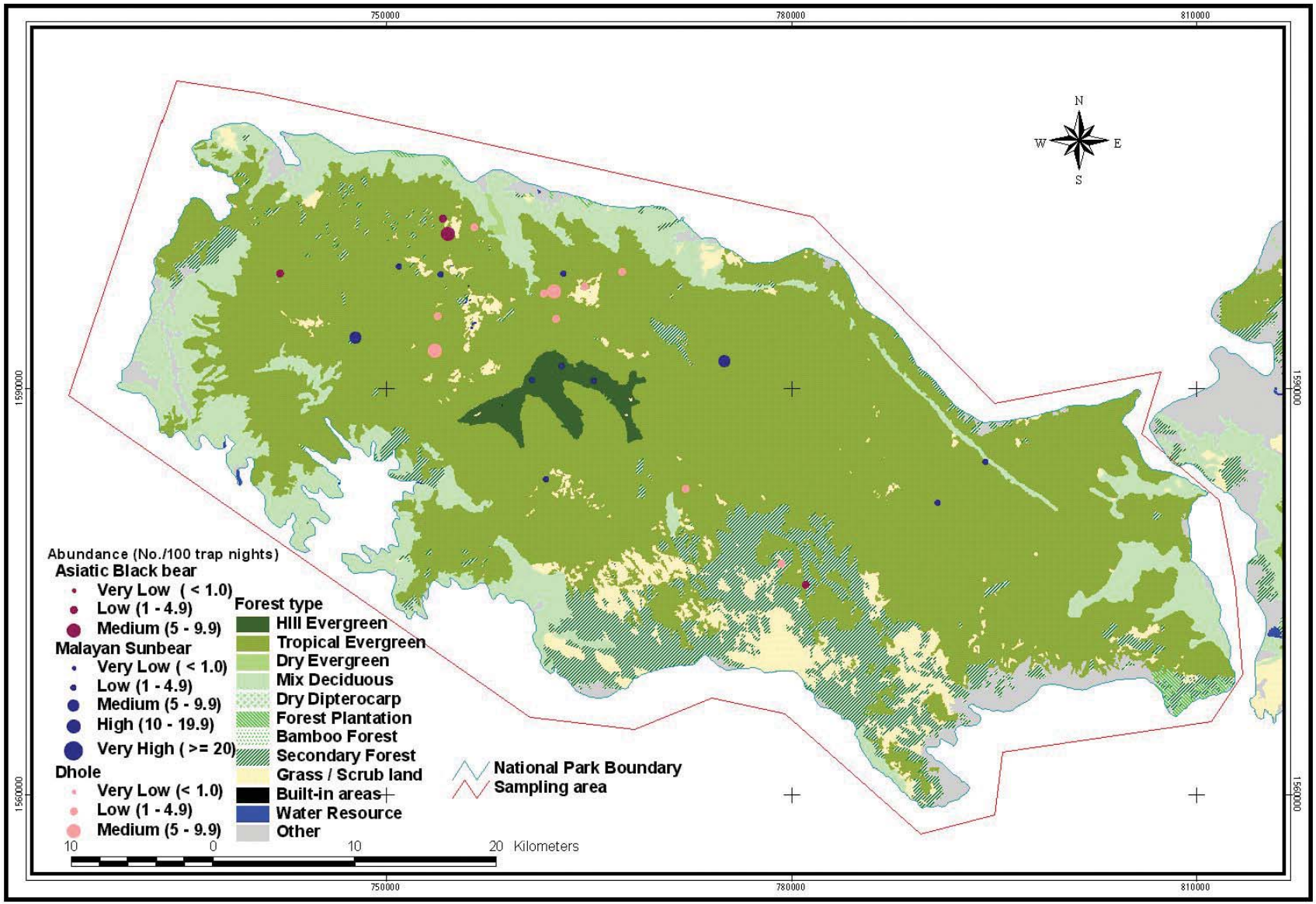

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Figure 6. b. Relative abundance and distribution of bears and dholes from camera-trapping in Thap Lan and Ta Phraya National Parks.

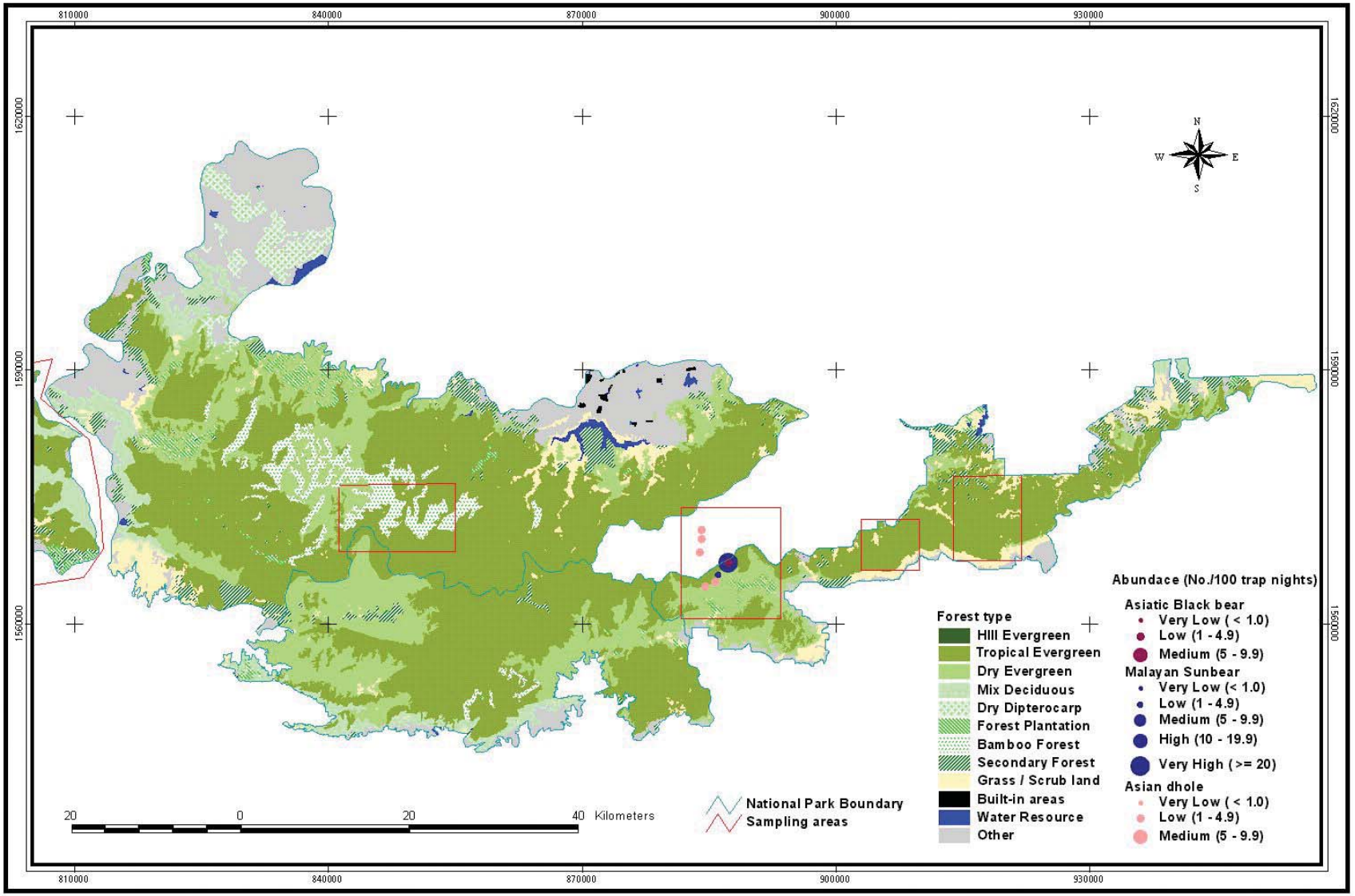

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Figure 7. a. Relative abundance and distribution of civets and other small carnivores in Khao Yai National Park.

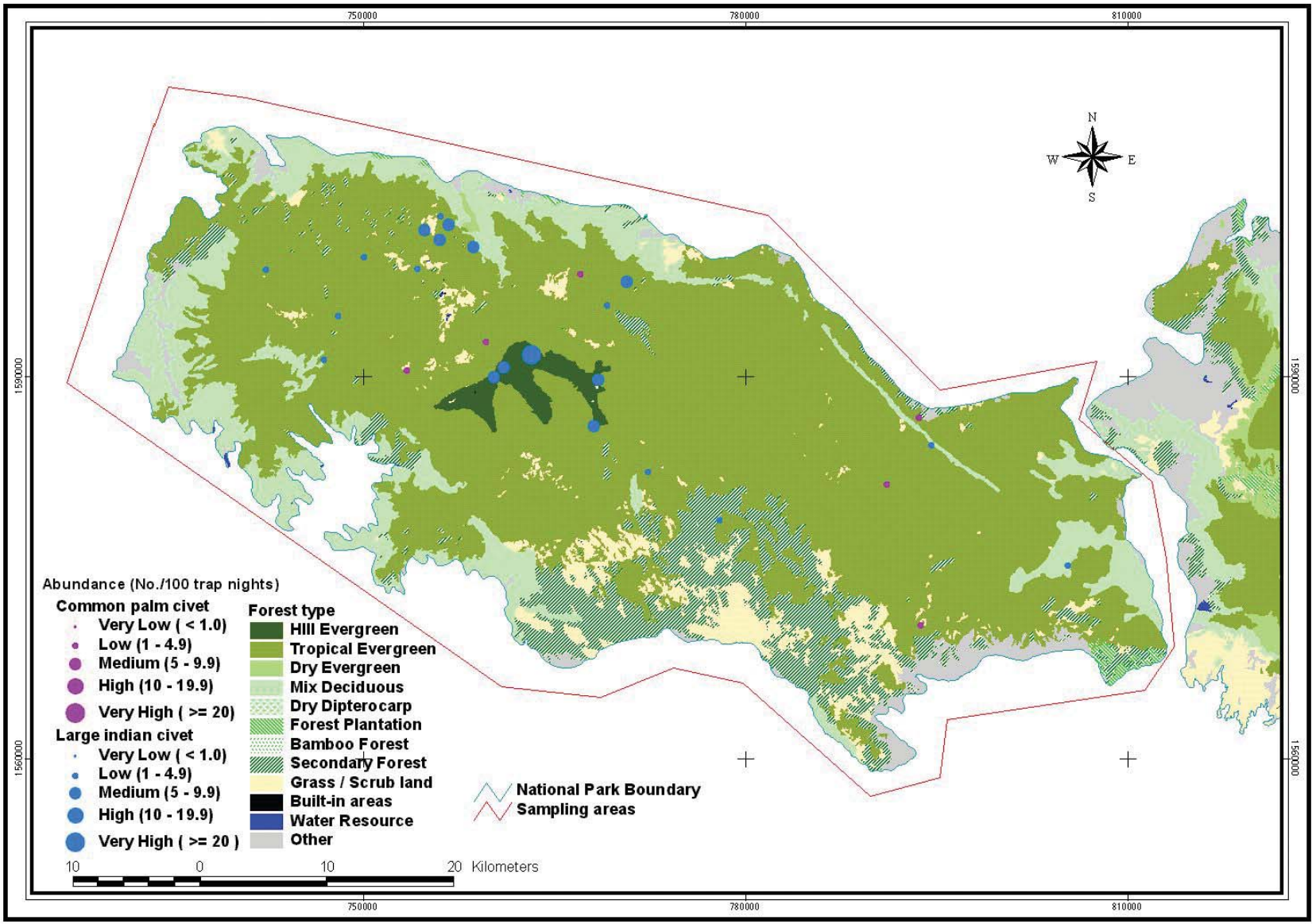

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Figure 7. b. Relative abundance and distribution of civets and other small carnivores from camera-trapping in Thap Lan and Ta Phraya National Parks.

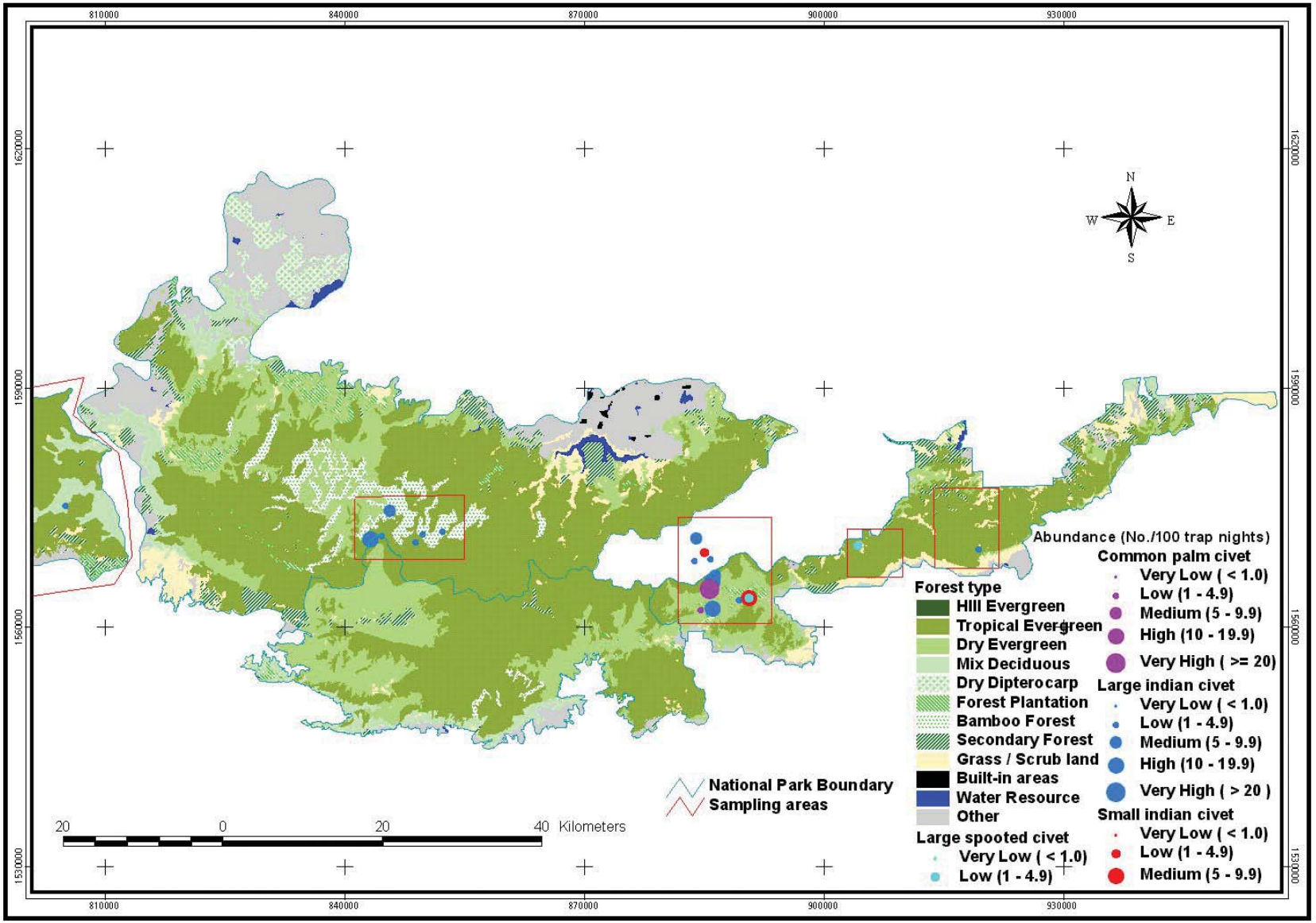

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Figure 8. a. Relative abundance and distribution of large ungulates in Khao Yai National Park.

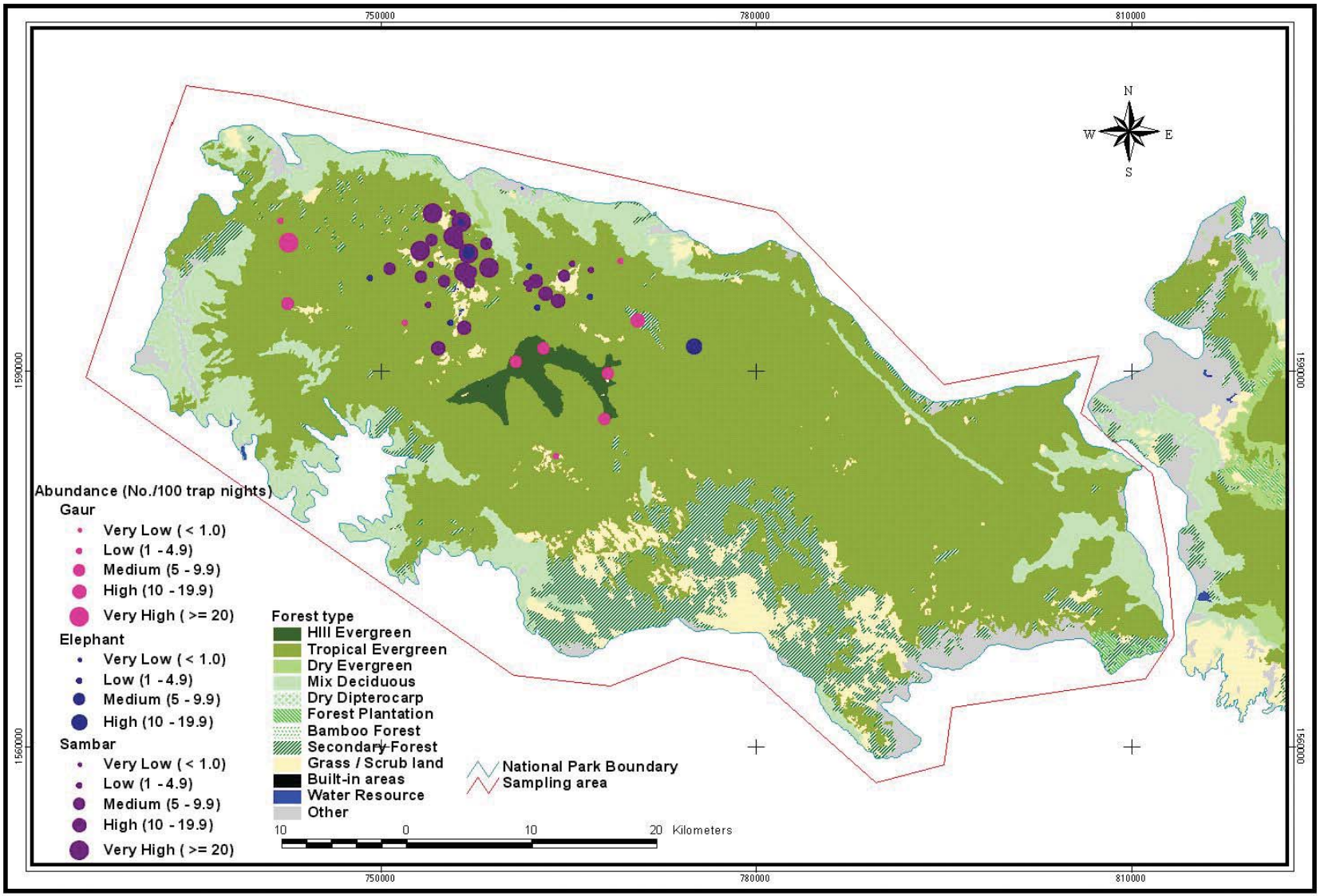

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Figure 8. b. Relative abundance and distribution of small - medium ungulates in Khao Yai National Park.

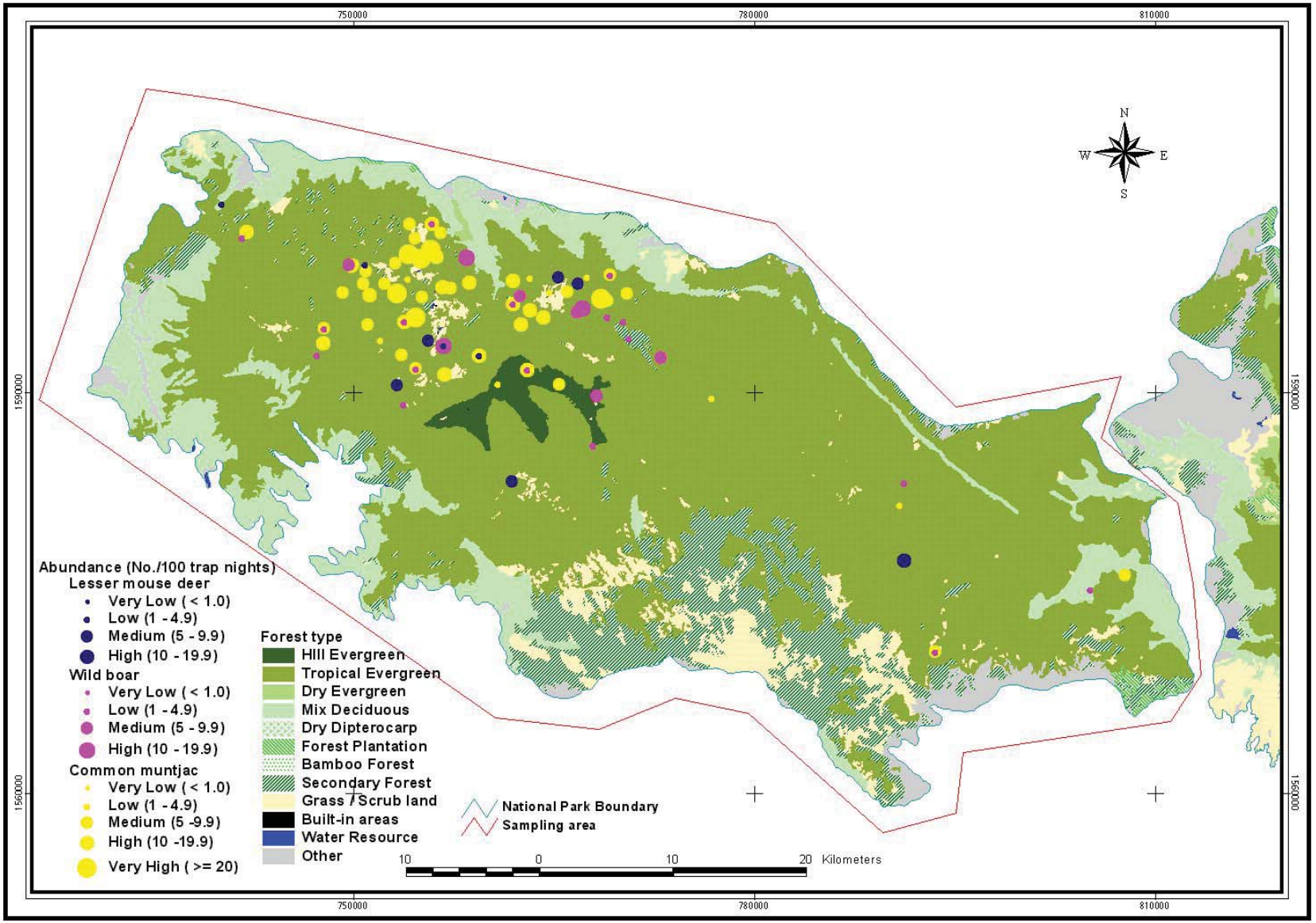

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Figure 8. c. Relative abundance and distribution of ungulates from camera-trapping in Thap Lan and Ta Phraya National Parks.

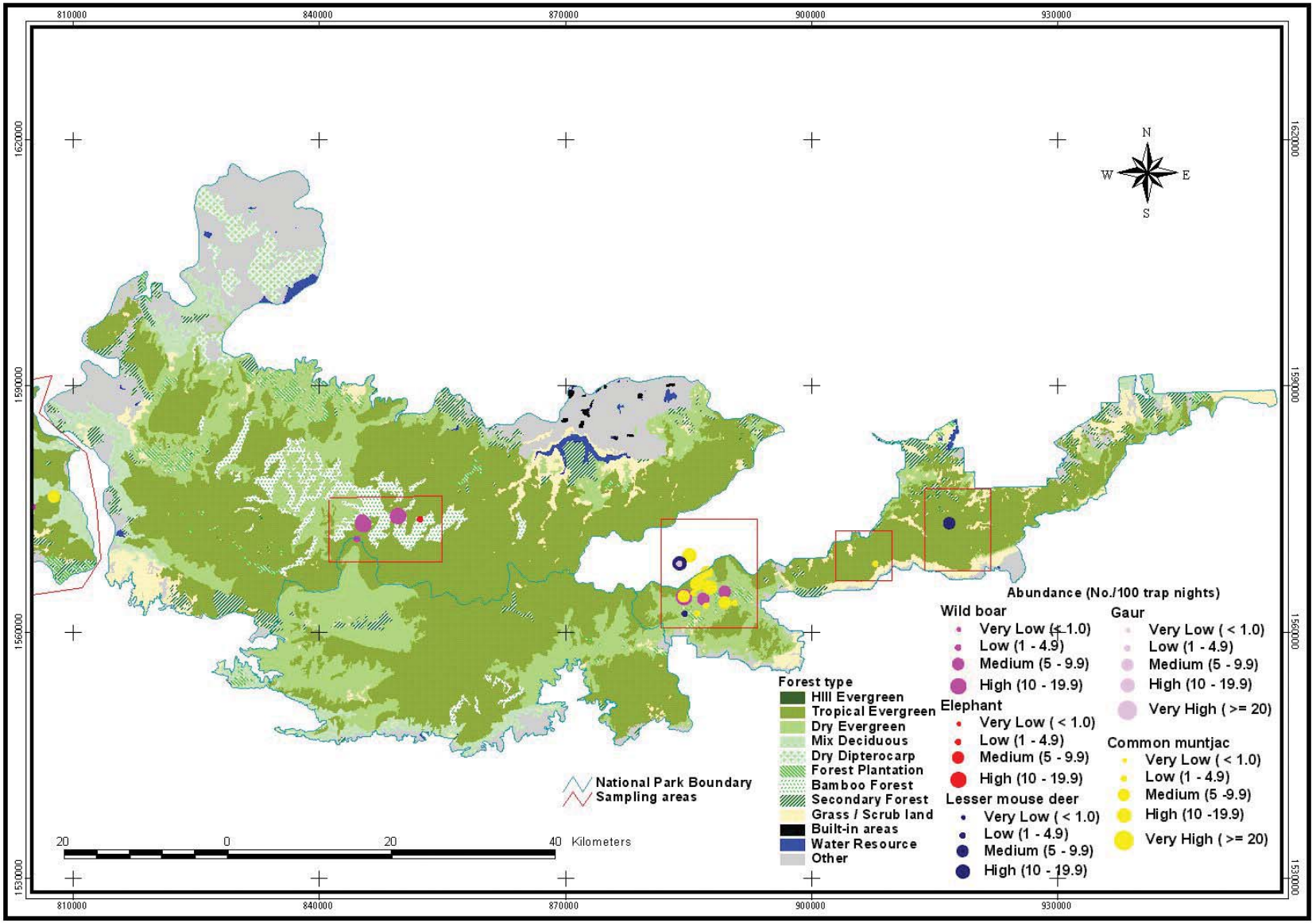

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Figure 9. a. Relative abundance and distribution of primates in Khao Yai National Park.

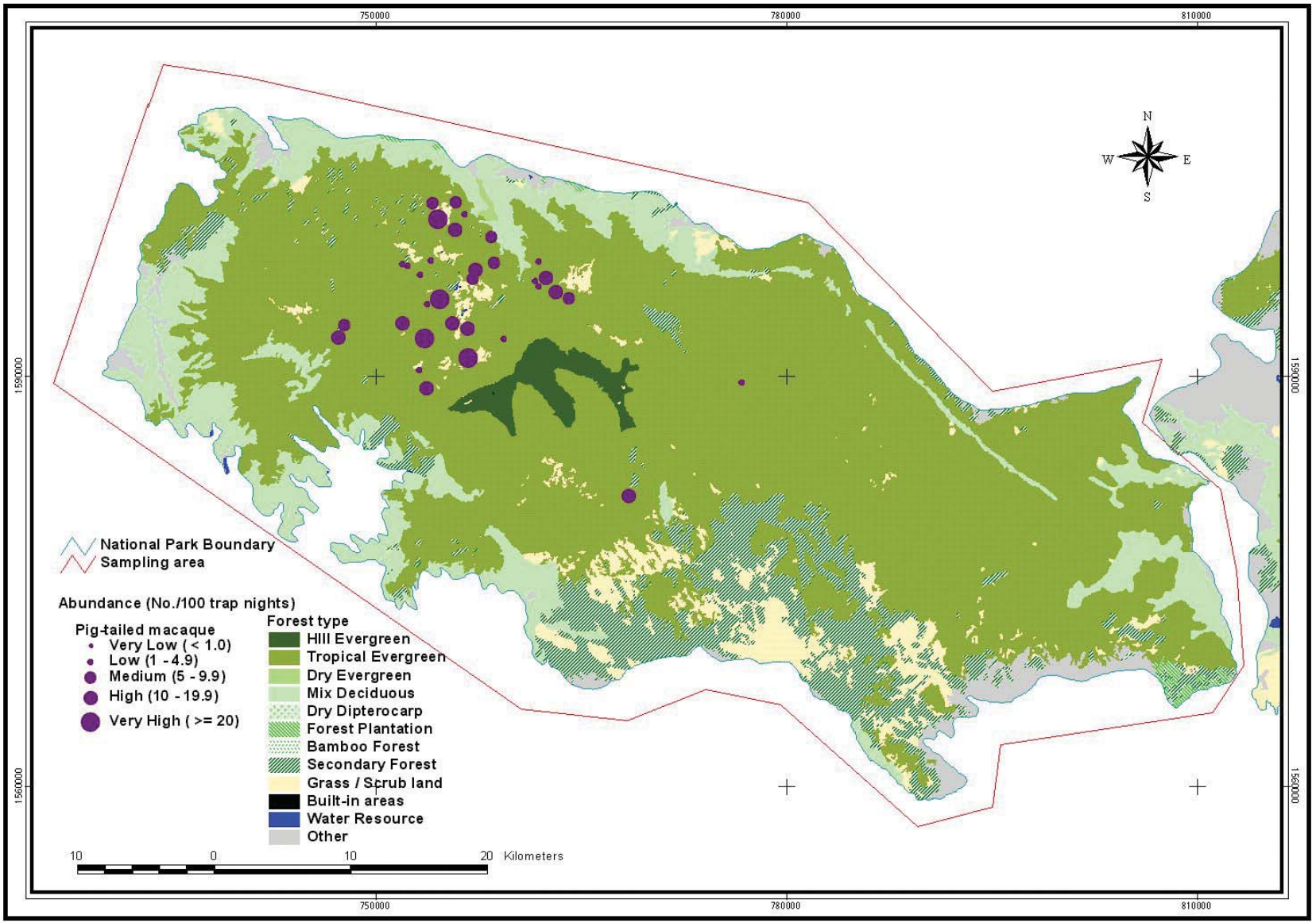

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Figure 9. b. Relative abundance and distribution of primates from camera-trapping in Thap Lan and Ta Phraya National Parks.

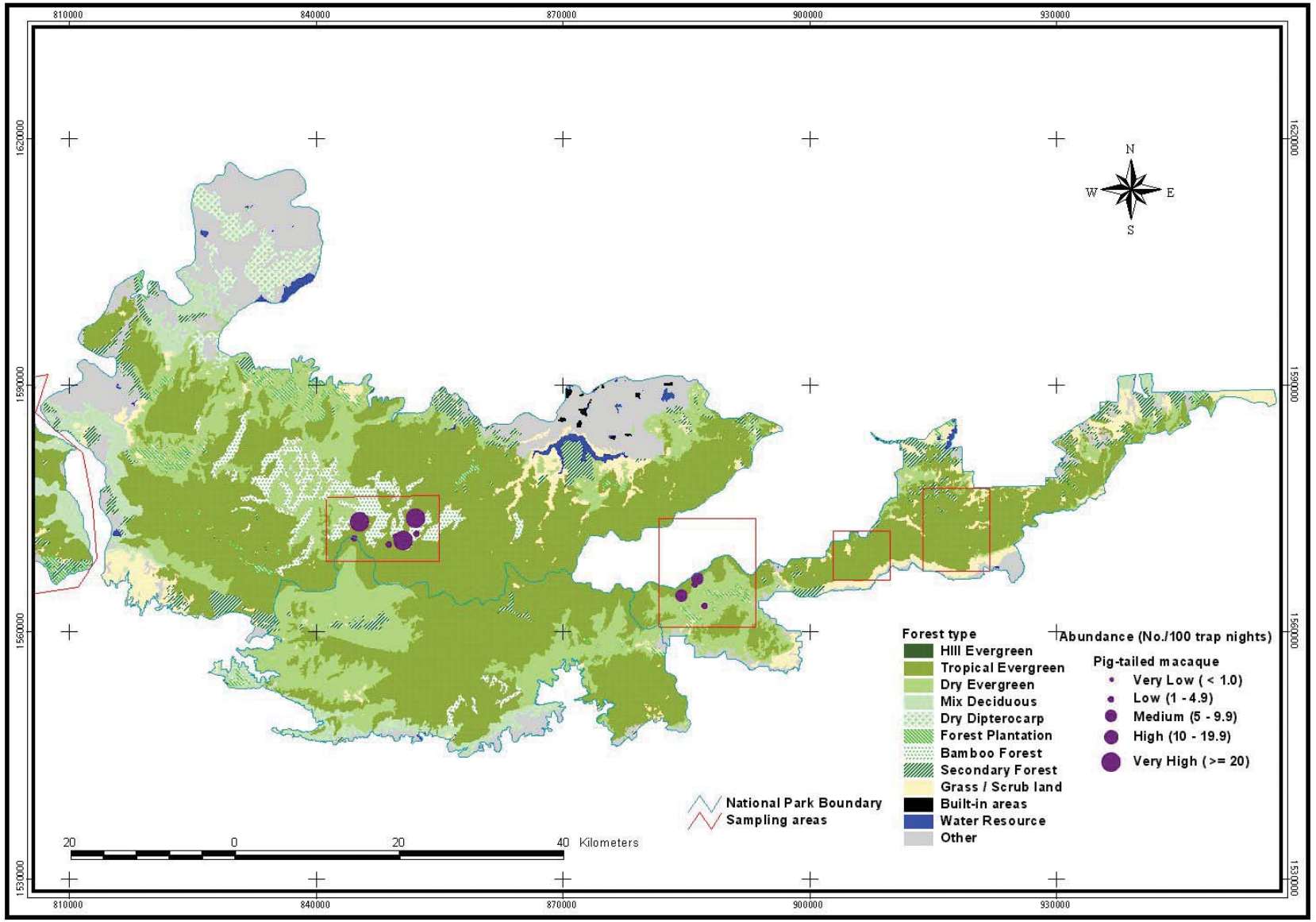

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Figure 10. a. Relative abundance and distribution of other mammals in Khao Yai National Park.

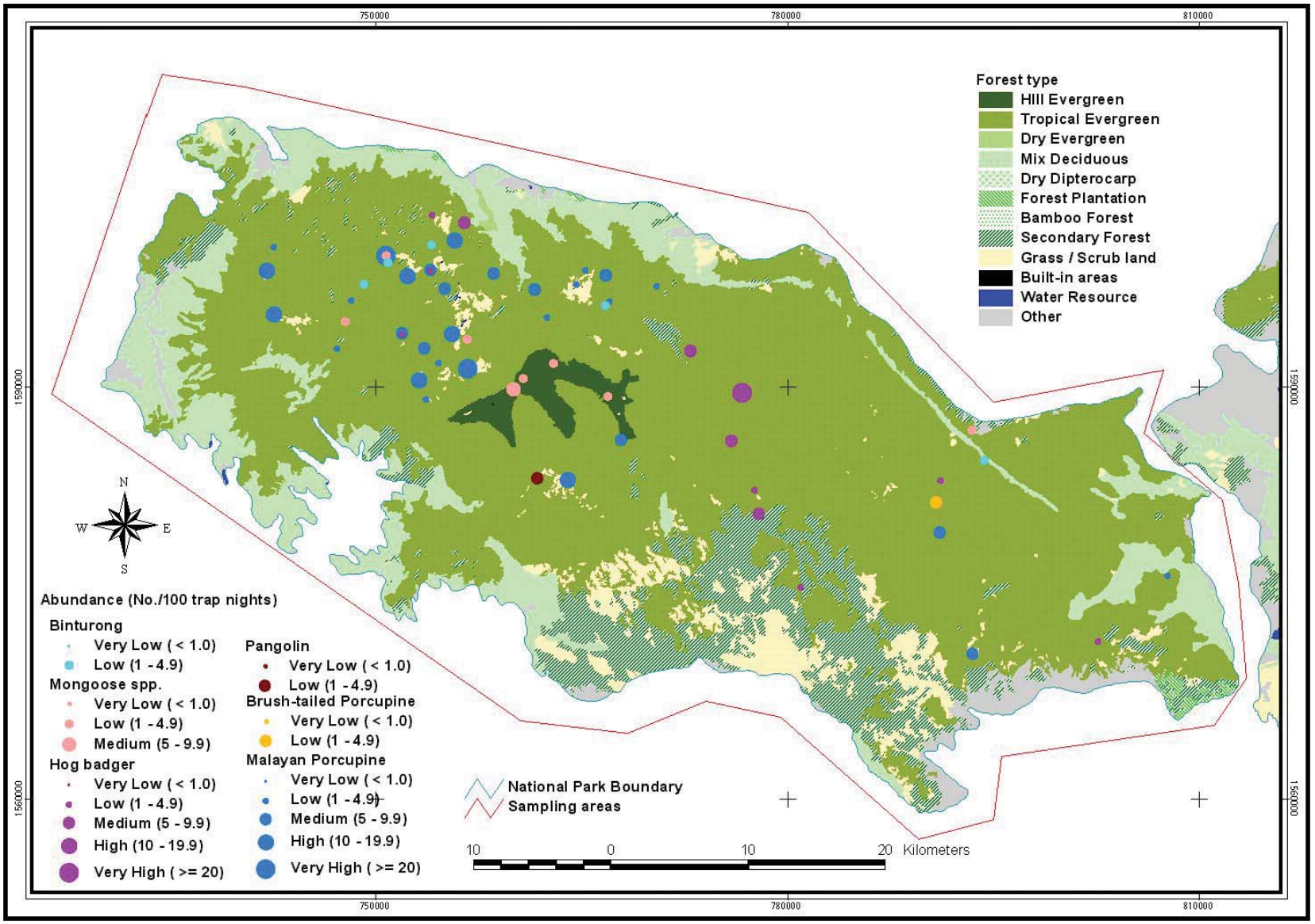

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Figure 10. b. Relative abundance and distribution of other mammals from camera-trapping in Thap Lan and Ta Phraya National Parks.

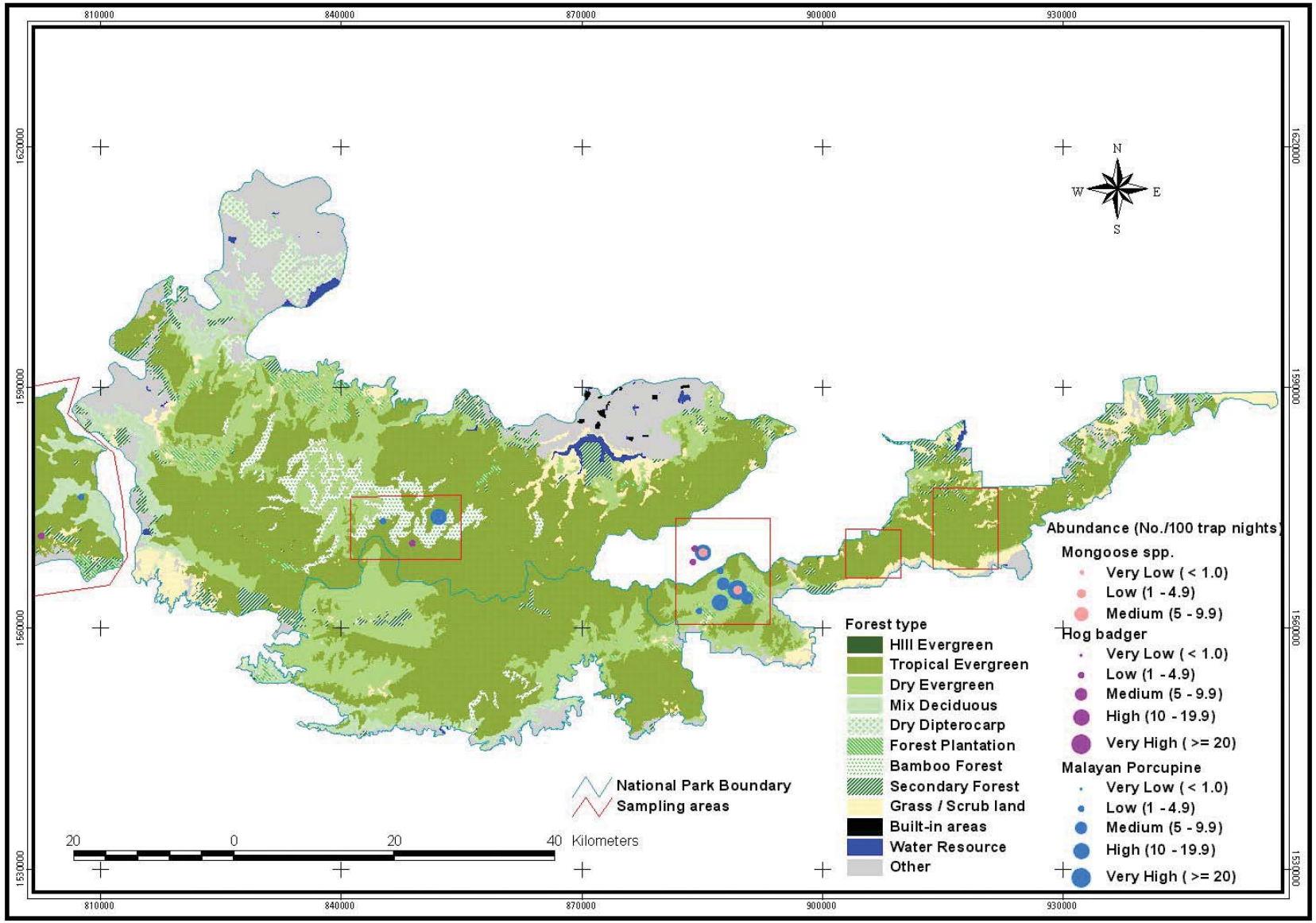

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Figure 11. a. Intensity and distribution of illegal human traffic from camera-trapping in Khao Yai National Park.

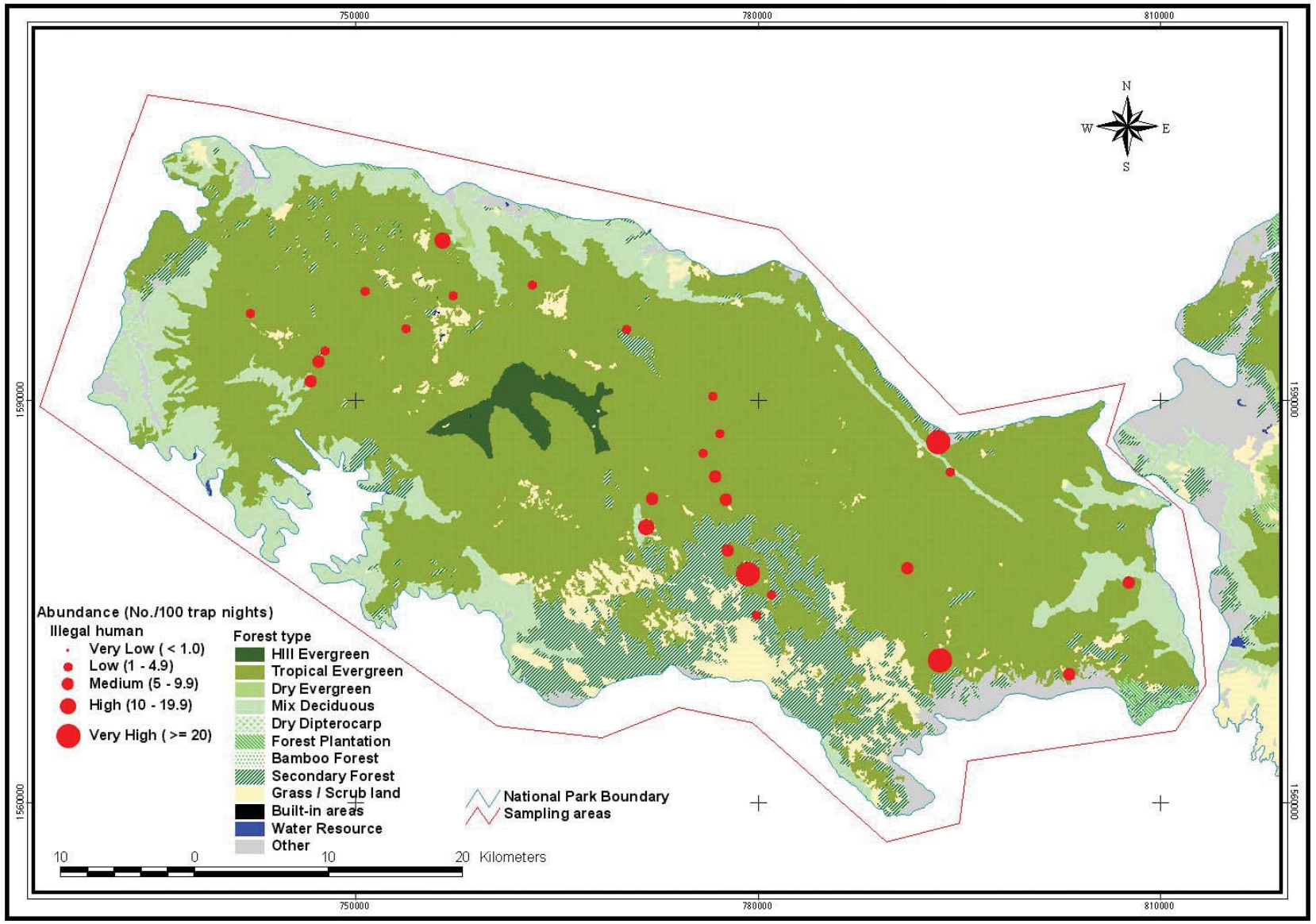

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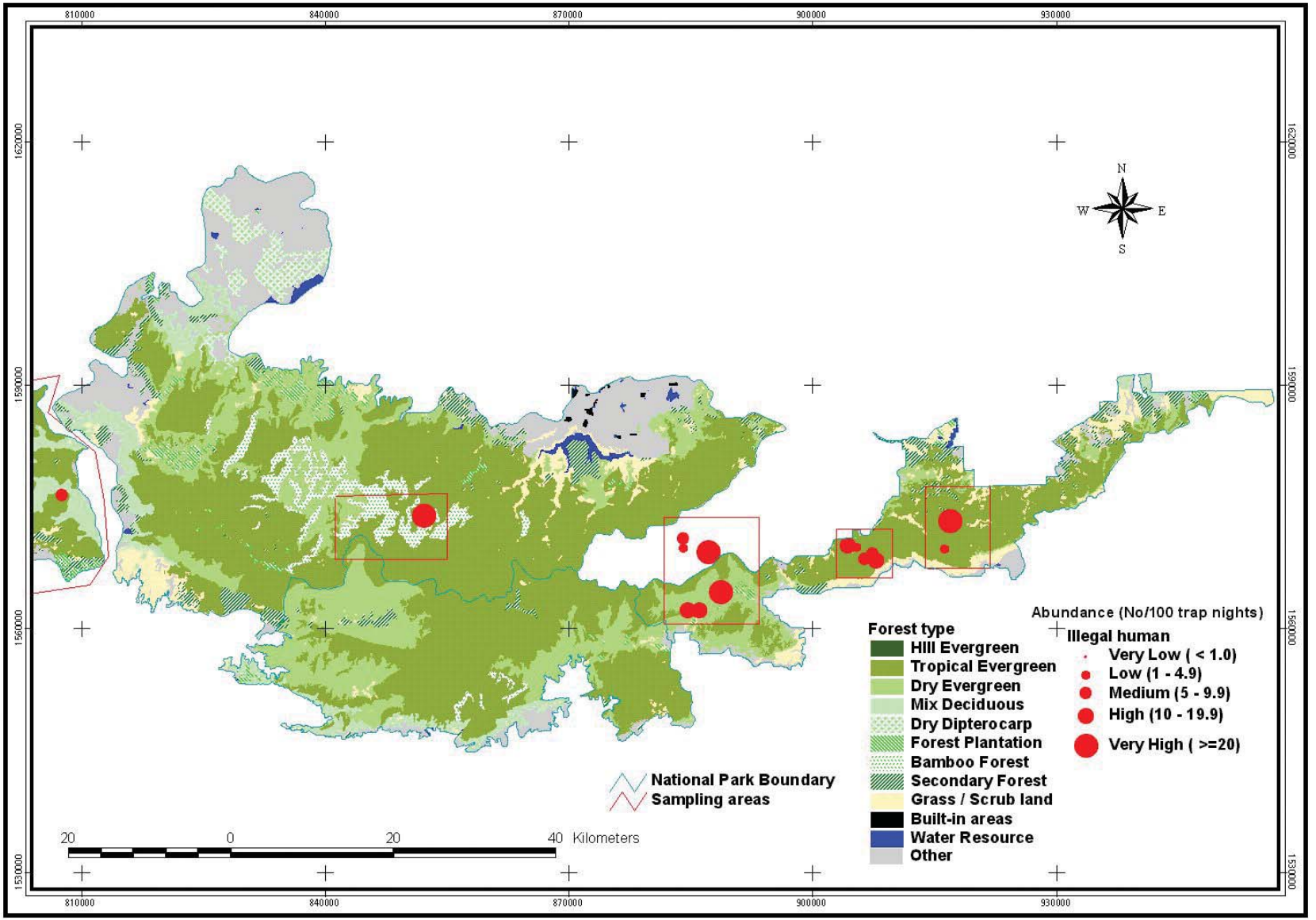
Figure 11. b. Intensity and distribution of illegal human traffic from camera-trapping in Thap Lan and Ta Phraya National Parks.



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Sunda Pangolin *Manis javanica* (Desmarest, 1822)

World Range — *M. javanica* is found Myanmar from S. Myanmar, Thailand, Lao PDR, Vietnam, Cambodia, Peninsular Malaysia, Indonesia and the Philippine island of Palawan (Lekagul and McNeely, 1977; Duckworth *et al.*, 1999; Corbet and Hill, 1992).

Thai Range — Distribution in Thailand is widespread, found in many forest types of lower altitudes, including both primary and secondary forest, also found in rubber plantations gardens, and elsewhere around human settlement (Lekagul and McNeely, 1977). Populations may have suffered large declines in recent years due to poaching for illegal trade in pangolin scales, meat and blood which is traded internationally with Vietnam and China.

Conservation Status
- Globally Low Risk - Near-threatened
- CITES Appendix II
- WARPA (1980): Protected-1

Khao Yai — Recorded from camera-trap surveys at Khlong E-Tow during 2001–2002 (Lynam *et al.*, 2003). Large numbers of pangolins confiscated from a wildlife trader were released in the park in 2003. These animals probably originated in either Peninsular Malaysia or Indonesia. Although animals were not monitored, presumably some fraction of animals survived the release. Therefore, the release may have introduced deleterious genes or diseases to the resident population.

Other reserves — Probably also occurs in other protected areas in the complex.

Ecology — Possibly occurs in low densities in DPKY reserves but highly subject to poaching for trade in medicines. Information on the status of *M. javanica* populations in Southeast Asia is fragmentary but there is concern that it is becoming increasingly rare. The Chinese traditional medicine attributes antiseptic and curative qualities of the scales, blood and flesh (Read & Ching-mei, 1931).

Pig-tailed Macaque *Macaca nemestrina* (Linnaeus, 1766)

World Range — Mainland Southeast Asia, Sumatra, Borneo, and offshore islands (Lekagul and McNeely, 1977; Corbet and Hill, 1992; J.W. Duckworth, pers. comm.).

Thai Range — Historical distribution was widespread but discontinuous in suitable habitat, excluding the central lowlands and eastern plateau. Current range reduction and population decline caused by habitat loss (Crockett and Wilson, 1980).

Conservation Status
- Globally threatened - Vulnerable
- Potentially At Risk in Lao PDR
- CITES Appendix II
- WARPA (1980): Protected-1
- WARPA (2nd edition 2003): Captive breeding permitted with registration prior to September 9, 2003

Khao Yai — Low detection rate with camera-traps (RAI=2.9 ± 0.6 / 100 trapnights) around National Park headquarters area where semi-tame animals are encountered along the entrance road. Not found in the centre and eastern parts of the park or around the perimeter, possibly due

to hunting pressure since habitat is otherwise suitable. Mean group size at Khlong E-Tow ranged from 3.5–16 individuals with group density 0.1–1 group/km^2 (Lynam *et al.*, 2003). Density of individuals at Khlong E-Tow was 2.1–27.7 individuals/km^2. Hunted for subsistence especially by aloewood (*Aquilaria crassna*) collectors.

Thap Lan Low detection rate in the centre of park (RAI=3.2 ± 1.2 individuals / 100 trapnights, n=21).

Pang Sida Reported to occur (Mauric, 1996).

Ta Phraya Very low detection rate (RAI=0.4 ± 0.2 individuals /100 trapnights, n=46).

Ecology *M. nemestrina* usually inhabits inland evergreen or deciduous forests, occurs marginally in plantations and other disturbed habitats (Corbet and Hill, 1992); they are rarely found on off shore islands, where *M. fascicularis* seem more common (Lekagul and McNeely, 1977). Appears to be restricted to less disturbed parts of the DPKY where it is reasonably common. Diurnal in behaviour (WCS unpublished data).

Long-tailed Macaque *Macaca fascicularis* (Raffles, 1821)

World Range *M. fascicularis* is known from peninsular Myanmar, Thailand, S Lao, Cambodia, N and S Vietnam, the Philippines, Peninsula Malaysia, Sumatra, Java, Borneo, and many other islands of the Sunda Shelf, but not Sulawesi, (Lekagul and McNeely, 1977; J.W. Duckworth pers. comm.). The species has been introduced to Mauritius (Corbet and Hill, 1992).

Thai Range The Thai populations lie at the northern limits of the species' range in mainland Southeast Asia (Corbet and Hill, 1992). The range is complementary with that of *M. mulatta*. Long-tailed Macaques reside on many islands including, Ko Kut, Ko Chang, Ko Kram and Ko Tarutao. The population on Ko Kram is recognized as a distinct subspecies, *M. f. atriceps* (Lekagul and McNeely, 1977).

Conservation Status
- Globally Near-threatened
- Potentially At Risk in Lao PDR
- CITES Appendix II
- WARPA (1980): Protected-1
- WARPA (2nd edition 2003): Captive breeding permitted with registration prior to September 9, 2003

Pang Sida/Thap Lan Reported to occur (Mauric, 1996; MASS database), but no confirmed record.

Ecology Characteristic of forest edge and occurs in plantations and other disturbed habitats (Corbet and Hill, 1992). In agricultural areas they do considerable damage to crops (Lekagul and McNeely, 1977). Possibly very rare in DPKY due to hunting.

White-handed Gibbon *Hylobates lar* (Linnaeus, 1771)

World Range *H. lar* occurs in peninsular Malaysia (except N), Thailand, Tenasserim, Myanmar, east of the Salween River and west of the Mekong River, south-western Yunnan Province (China), western Lao PDR. A disjunct population also occurs in northwestern Sumatra (Lekagul and McNeely, 1977; Corbet and Hill, 1992).

Thai Range	Most of the range of *H. lar* is in Thailand. It is absent from eastern and southeastern Thailand (Lekagul and McNeely, 1977; Brockelman, 1975).
Conservation Status	• Globally Near Threatened • At Risk in Lao PDR • CITES Appendix I • WARPA (1980): Protected-1 • Vulnerable in Thailand
Khao Yai	Occurs in the western part of the park, and is rare or absent from perimeter areas (Trisurat *et al.*, 1996). Abundance highest around the HQ area where it occurs at a density of 1.4–5.9 individuals/ km^2 (Lynam *et al.*, 2003), and in the Khao Samor Pun area. *H. lar* has small areas of overlapping distribution with *H. pileatus* (Brockelman, 1978; Brockelman and Gittins, 1984).
Ecology	*H. lar* is exclusively arboreal, confined to primary forest of various types, including rainforest, evergreen, and mixed deciduous-evergreen forest (Lekagul and McNeely, 1977). Restricted to less disturbed parts of forests where hunting pressure is low.

Pileated Gibbon *Hylobates pileatus* (Gray, 1861)

World Range	*H. pileatus* is endemic to eastern Thailand, west Cambodia, and to SW Lao PDR (Brockelman, 1975; Lekagul and McNeely, 1977; Marshall and Sugardjito, 1986; Corbet and Hill, 1992; J.W. Duckworth pers. comm.).
Thai Range	Distribution in Thailand is from Khao Yai National Park south and east to Khao Ang Rue Nai, Khao Khieo, Khao Soi Dao Wildlife Sanctuary, and Khao Chamao National Park. Originally this range was continuous over large units of habitat, but now the distribution of *H. pileatus* is fragmented, with the species becoming rare and localised (Brockelman, 1975).
Conservation Status	• Globally Threatened - Vulnerable • At Risk in Lao PDR • CITES Appendix I • WARPA (1980): Protected-1 • Endangered in Thailand
Khao Yai	*H. pileatus* occurs from an area north and south of Khao Rom eastwards; west of these areas *H. lar* increase in frequency. Some natural hybrids between the *H. lar* and *H. pileatus* are found in the overlap zone, recognizable by pelage and voice (Brockelman and Gittins, 1984; Brockelman and Schilling, 1984; Marshall and Brockelman, 1986; Marshall and Sugardjito, 1986). Where both *H. pileatus* and *H. lar* occupy the forest in non-overlapping territories, each has a similar density of 1–2 families per km^2 (Marshall *et al.*, 1972; Brockelman, 1975).
Thap Lan	One group encountered by bird survey team at Lam Chae area.
Ta Phraya	Scarce; occasionally heard by survey team
Pang Sida	Reported to occur (Mauric, 1996).

Ecology Occurs in relatively undisturbed evergreen, semi-evergreen and mixed evergreen-deciduous forests at all elevations below about 1000 m.

Golden Jackal *Canis aureus* (Linnaeus, 1758)

World Range Thailand and Myanmar through the whole of India and Pakistan, Sri Lanka, SW Asia, SE Europe, and Africa (Corbet and Hill, 1992).

Thai Range N and W Thailand, with a disjunct population in the DPKY Complex (Parr, 2004).

Conservation Status
- Little Known in Lao PDR
- WARPA (1980): Protected.

Khao Yai One individual recorded by camera-trap at Prachantakam District, Prachinburi Province, March 2002.

Pang Sida Reported to occur (Mauric, 1996).

Ecology Occurs in open habitats frequently around towns and villages (Corbet and Hill, 1992).

Dhole *Cuon alpinus* (Pallas, 1811)

World Range *C. alpinus* occurs in parts of Siberia, South Asia, Mainland Southeast Asia Sumatra, and Java (Lekagul and McNeely, 1977).

Thai Range The species occurs widely in remnant habitats across Thailand but in only a few places *e.g.* central Khao Yai, is it truly abundant. Two subspecies are recognized in Thailand, *C. a. adustus* to the north of the Isthmus of Kra and *C. a. sumatrensis* to the south. It apparently does not occur in the Central Valley of the Chao Phraya nor in most of the northeastern Khorat Plateau (Lekagul and McNeely, 1977). Areas where *C. alpinus* are known to occur in Thailand are protected, such as Khao Yai National Park and Khao Soi Dao Wildlife Sanctuary.

Conservation Status
- Globally Threatened - Endangered
- At Risk in Lao PDR
- CITES Appendix II
- Vulnerable in Thailand

Khao Yai Frequently seen around the National Park HQ area (*e.g.* Nettlebeck 1995) where they have apparently replaced tiger as the dominant top carnivore and are regularly reported seen chasing sambar in open grasslands. Possibly threatened by hunting and shortage of large prey. Very low detection rate with camera-traps (RAI=0.4 ± 0.1 individuals /100 trapnights, n=121). Large packs up to 20–30 individuals are reported.

Thap Lan Not recorded by survey.

Pang Sida Reported to occur (Mauric, 1996).

Ta Phraya Very low detection rate (RAI= 0.5 ± 0.2 individuals /100 trapnights, n=46).

Ecology Locally common in DPKY where prey species occur. *C. alpinus* are forest animals, avoiding contact with man (Lekagul and McNeely, 1977). They are communal hunters (Corbet and Hill, 1992). At Khao Yai, Dhole are active 75% of the time during the day and 25% at night (WCS, unpublished data).

Asiatic Black Bear *Ursus thibetanus* (G. Cuvier, 1823)

World Range	From Afghanistan and Pakistan eat to the Himalayas, Assam, Myanmar, N Thailand, Indochina and S China. Also Japan, Korea, Taiwan, and Hainan Myanmar, and Indochina (Lekagul and McNeely, 1977; Corbet and Hill, 1992).
Thai Range	Found in hill areas throughout Thailand north of Kra. Mostly occurs in the north and west of the country (Lekagul and McNeely, 1977).
Conservation Status	• Globally Threatened - Vulnerable • At Risk In Lao PDR • CITES Appendix I • WARPA (1980): Protected-2. • Vulnerable in Thailand
Khao Yai	Reaches greatest abundance near National Park HQ, Khao Samor Pun, and in the Sai Yai area (Trisurat *et al.*,1996). Very low detection rate with camera-traps (RAI=0.08 ± 0.05 individuals /100 trapnights, n=121).
Thap Lan	Not detected by survey.
Pang Sida	Reported to occur (Mauric, 1996).
Ta Phraya	Not detected by survey.
Ecology	Rare in DPKY reserves and subject to hunting for commercial trade. *U. thibetanus* prefers the sub-montane and mixed deciduous forests of the hills and mountains of northern and western Thailand, but is sometimes found at lower elevations (Lekagul and McNeely, 1977).

Sun Bear *Helarctos malayanus* (Raffles, 1821)

World Range	SW China, Assam, Myanmar, Vietnam, to Peninsular Malaysia, Sumatra, Borneo (Corbet and Hill, 1992).
Thai Range	Widespread and found in various forest types throughout the country, though it is more common in the south (Lekagul and McNeely, 1977).
Conservation Status	• Data Deficient • At Risk In Lao PDR • CITES Appendix I • WARPA (1980): Protected-2. • Vulnerable in Thailand
Khao Yai	Most frequently recorded near National Park HQ, Khao Samor Pun, and in the Sai Yai area (Trisurat *et al.*, 1996). Very low detection rate with camera-traps (RAI=0.7 ± 0.3 individuals /100 trapnights, n=121).
Thap Lan	Not detected by survey.
Pang Sida	Reported to occur (Mauric, 1996).
Ta Phraya	Very low detection rate (RAI= 0.7 ± 0.4 individuals /100 trapnights, n=46).
Ecology	Generally scarce in DPKY reserves and subject to hunting for commercial trade. *H. malayanus* inhabits dense forests at all elevations.

Ferret-Badger *Melogale* spp.

World Range	Nepal, N India, Myanmar, Thailand, Indochina, Java and Borneo (Lekagul and McNeely, 1977).
Thai Range	All forest types throughout Thailand except the central plains (Parr, 2004).
Conservation status	Little known in Lao PDR
Khao Yai	Recorded by camera-trap at UTM 47P 803218 1569499 on 25th February, 2002 at 02:24hrs.
Pang Sida	Reported to occur (Mauric, 1996).
Ecology	Crepuscular, primarily terrestrial but may climb trees (Parr 2004). The two species *M. personata* and *M. moschata* may be confused since they are similar in external appearance but differ in dentition characteristics.

Smooth-Coated Otter *Lutrogale perspicillata*

World Range	Pakistan, most of India, SW Yunnan, Indochina, and S to Peninsular Malaysia, Myanmar, and Sumatra. A small isolated population in Iraq (Corbet and Hill, 1992).
Thai Range	It ranges from seacoasts up into low hills throughout Thailand. *L. perspicillata* is now uncommon in Thailand (Lekagul and McNeely, 1977) mostly due to habitat destruction.
Conservation Status	• At Risk In Lao PDR • CITES Appendix II • WARPA (1980): Protected-1 • Vulnerable in Thailand
Khao Yai	Frequently seen at Nong Pak Chi reservoir 2 km from HQ
Pang Sida	Reported to occur (Mauric, 1996).
Ecology	*L. perspicillata* mostly inhabits areas of low elevation (Lekagul and McNeely, 1977).

Oriental Small-clawed Otter *Aonyx cinereus*

World Range	S and N India and S China, to Peninsular Malaysia, Sumatra, Java, Borneo and some offshore islands Myanmar (Corbet and Hill, 1992).
Thai Range	Widespread except for the northeastern Korat Plateau and the Central Valley of the Chao Phraya (Lekagul and McNeely, 1977).
Conservation Status	• At Risk In Lao PDR • CITES Appendix II • WARPA (1980): Protected-1
Khao Yai	Occasionally seen in streams near Khlong E-Tow 4 km from HQ, and Nong Pak Chi, 2 km from HQ.
Pang Sida	Reported to occur (Mauric, 1996).
Ecology	*A. cinereus* is found in rivers, creeks, estuaries and mangroves (Lekagul and McNeely, 1977).

Large-Spotted Civet *Viverra megaspila*

World Range	*V. megaspila* occurs in Myanmar, Thailand, Indochina, Peninsular Malaysia, western Ghats and peninsular India (Lekagul and McNeely, 1977).
Thai Range	Widespread distribution throughout Thailand, found in various types of forest. However, surveys across 7 sites in northern, central and southern Thailand suggest the species was uncommon (Lynam, 2000). Duckworth (1997) found the same situation in Lao.
Conservation Status	• Potentially At Risk in Lao PDR • Vulnerable in Thailand
Khao Yai	Not detected by survey.
Thap Lan	Not detected by survey.
Pang Sida	Reported to occur (Mauric, 1996).
Ta Phraya	Very low detection rate with camera-traps (RAI=0.11 ± 0.07 individuals /100 trapnights, n=46).
Ecology	Rare in DPKY reserves. Co-occurring with *V. zibetha* at Ta Phraya. *V. megaspila* is found in a wide range of wooded habitats probably below 300 m, sometimes in disturbed or secondary habitats (Lynam *et al.* in press).

Binturong *Arctictis binturong*

World Range	Mainland Southeast Asia, Sumatra, Java, Borneo, and the Philippine island of Palawan (Corbet and Hill, 1992).
Thai Range	Widespread in Thailand (Lekagul and McNeely, 1977) and probably one of the more common civet species.
Conservation Status	• At Risk In Lao PDR • CITES Appendix III • WARPA (1980): Protected-1
Khao Yai	Very low detection rate with camera-traps (RAI=0.10 ± 0.04 individuals /100 trapnights, n=121).
Thap Lan	Not detected by survey.
Pang Sida	Reported to occur (Mauric, 1996).
Ta Phraya	Not detected by survey.
Ecology	Restricted to less disturbed parts of DPKY. Abundance certainly underestimated by survey methods. This largely arboreal civet is confined to tall forests, both primary and secondary. It obtains most of its food from trees including fruiting figs, but on rare occasions it forages on the ground (Lekagul & McNeely 1977; Nettelbeck 1997).

Fishing Cat *Prionailurus viverrinus* (Bennett, 1833)

World Range	Occurs in isolated populations in southern India and Sri Lanka. The major distribution of the species is from Nepal through eastern India, Bangladesh, Myanmar, Thailand, Indochina, Sumatra, and Java (Lekagul and McNeely, 1977; Corbet and Hill, 1992).
Thai Range	Appears generally scarce but is locally common in some places such as Thale Noi, Patthalung (J. Murray, pers. comm. 2004).
Conservation Status	• Globally Threatened - Vulnerable

- Little Known In Lao PDR
- CITES Appendix I

Khao Yai Rare. A provisional sighting of two individuals was made near Khlong E-Tow substation on 26.12.2000 (UTM 1595000N 0751500E) by T. Charoendong. Not detected by camera-trap or track and sign survey.

Thap Lan Not detected by survey.

Pang Sida Reported to occur (Mauric, 1996).

Ta Phraya Not detected by survey.

Ecology Rare in DPKY. *P. viverrinus* usually live in the brush or scrub associated with wetlands, particularly swamps, marshes, and mangroves. They have also been recorded in dense vegetation close to streams in submontane and mixed deciduous forests (Lekagul and McNeely, 1977).

Asiatic Golden Cat *Catopuma temmincki* (Vigors and Horsfield, 1827)

World Range Tibet, Nepal, and Sikkim, east through Assam and Myanmar, S China, Thailand, Indochina, Peninsular Malaysia, and Sumatra. (Lekagul and McNeely, 1977).

Thai Range Found sparsely distributed in suitable habitats throughout the country (Lekagul and McNeely, 1977; Lynam, 2000).

Conservation Status
- Globally Threatened - Vulnerable
- Little Known In Lao PDR
- CITES Appendix I

WARPA (1980): Protected-1
- Endangered in Thailand

Khao Yai Very low detection rate with camera-traps (RAI=0.3 ± 0.2 individuals /100 trapnights, n=121).

Thap Lan Very low detection rate (RAI= 0.1 ± 0.1 individuals /100 trapnights, n=21).

Pang Sida Reported to occur (Mauric, 1996).

Ta Phraya Not detected by survey.

Ecology Scarce in DPKY. *C. temmincki* are found in both open and closed forests, and occasionally in more open habitats. (Lekagul and McNeely, 1977). In border areas, subject to hunting for skins (A.J. Lynam, pers. observations). There appears to be some variation in relative frequencies of different coat patterns across its range.

Marbled Cat *Pardofelis marmorata* (Martin, 1837)

World Range *P. marmorata* occurs in South Asia, Mainland Southeast Asia, Sumatra, and Borneo (Lekagul and McNeely, 1977).

Thai Range *P. marmorata* is found in forested areas, (Lekagul and McNeely, 1977). Surveys in 7 forests across Thailand indicated that it is quite rare (Lynam, 2000).

Conservation Status
- Globally Threatened - Vulnerable
- Little Known In Lao PDR
- CITES Appendix I
- USFWS (1980a): Endangered

	• WARPA (1980): Protected-1 • Endangered in Thailand
Khao Yai	Very low detection rate with camera-traps (RAI=0.07 ± 0.05 individuals /100 trapnights, n=121).
Thap Lan	Not detected by survey.
Pang Sida	Reported to occur (Mauric,1996).
Ta Phraya	Not detected by survey.
Ecology	Rare in DPKY, cryptic, and possibly restricted to the least disturbed forest areas. *P. marmorata* is a jungle-dwelling cat, found in peninsular wet seasonal evergreen forest, Malayan mixed dipterocarp forest, montane forest and possibly mixed deciduous forest.

Clouded Leopard *Neofelis nebulosa* (Griffith, 1821)

World Range	*N. nebulosa* occurs in South Asia, southern China, Taiwan, Thailand, Indochina, peninsular Malaysia, Sumatra, and Borneo. (Lekagul and McNeely, 1977). There exists a continuing high demand for their skins in Thailand (Martin and Redford, 2000), and hunting and reduction of their forest habitat in Myanmar and Cambodia means they are probably threatened in those countries by illegal cross-border trade.
Thai Range	Camera-trapping over 7 sites in Thailand suggests they are more widespread than previously thought (Lynam, 2000
Conservation Status	• Globally Threatened - Vulnerable • At Risk In Lao PDR • CITES Appendix I • WARPA (1980): Protected-1 • Endangered in Thailand
Khao Yai	Very low detection rate with camera-traps (RAI=0.5 ± 0.1 individuals /100 trapnights, n=121).
Thap Lan	Not detected by survey.
Pang Sida	Reported to occur (Mauric, 1996).
Ta Phraya	Very low detection rate (RAI=0.9 ± 0.3 individuals /100 trapnights, n=46).
Ecology	Found in a wide range of forest types, both primary and secondary forest. Very seldom seen, appears to spend some of its time in trees (Davies, 1990) but also occurring on the ground where it was occasionally recorded from camera-traps. (Lekagul and McNeely, 1977; Lynam, 2000; Lynam *et al.*, 2003).

Leopard *Panthera pardus* (Linnaeus, 1758)

World Range	Africa, southern and eastern Asia as far north as N China, south through Indochina to Malaysia and Java (Corbet and Hill, 1992).
Thai Range	Occurs in larger forest complexes across the country (Lekagul and McNeely, 1977; Parr, 2004; Lynam, 2000). Appears to be a disjunction around the Isthmus of Kra where the population changes from predominantly black forms (south of Isthmus) to predominantly white forms (north of Isthmus)(Kawanishi *et al.* unpubl. report)
Conservation Status	• At Risk In Lao PDR

- CITES Appendix I
- WARPA (1980): Protected-2
- Vulnerable in Thailand

Khao Yai Not detected by survey and never confirmed from Khao Yai although unconfirmed reports exist whose origin could not be traced.

Thap Lan Not detected by survey.

Pang Sida Reported to occur (Mauric, 1996).

Ta Phraya Very low detection rate with camera-traps (RAI=0.13 ± 0.09 individuals/ 100 trapnights, n=46).

Ecology Rare in DPKY and limited by availability of prey. Probably competes with Tiger and Dhole, and where prey is limited may occur in the absence of these two. Due to poaching pressure and the loss of habitat, appears to be becoming scarce in Thailand (Lekagul and McNeely, 1977).

Tiger *Panthera tigris* (Linnaeus, 1758)

World Range Siberia to India, Bangladesh, Southeast Asia, and Indonesia (Sumatra) (Sunquist and Sunquist, 2002) but is now highly fragmented and reduced due to habitat loss and hunting for the commercial trade in tiger parts (Seidensticker *et al.*,1999).

Thai Range Tigers in Thailand are potentially found in 15 spatially disjunct forest complexes (Smith *et al.*, 1999), including DPKY. Tigers were recorded from 6 of 7 forest complexes where camera-trap surveys were attempted (Lynam *et al.*, 2001; Lynam, 2000).

Conservation Status

- Globally Threatened - Endangered
- At Risk In Lao PDR
- CITES Appendix I
- WARPA (1980): Protected-2
- Vulnerable in Thailand

Khao Yai Restricted to a narrow range in the center of the park in and surrounding managed grasslands where sambars are concentrated (Trisurat *et al.*, 1996). Only one individual was detected by camera-traps, with a minimum range of 212 km^2. A set of tracks of a second individual was detected in the Wan Leung area on 5 June 2000. Very low detection rate with camera-traps (RAI=0.14 ± 0.06 individuals / 100 trapnights, n=46). The last confirmed set of tracks was seen in Khao Laem area in March 2002 (T. Charoendong, pers. comm.). Occasional unconfirmed reports of tigers seen on the entrance road in Pak Chong District.

Thap Lan Detected by a single set of tracks in the survey plot but not by camera-traps.

Pang Sida Reported to occur (Mauric, 1996).

Ta Phraya Unconfirmed report of 2 tigers attacking livestock at southern perimeter of park on 14 October, 1998.

Ecology *P. tigris* are found in a wide variety of forest types, from evergreen to mixed dipterocarp and also those deciduous forests, which provide sufficient prey, water and cover (Schaller 1966). Rare in DPKY reserves as a result of insufficient prey due to poaching of prey species, direct poaching and human disturbance of habitats.

Asian Elephant *Elephas maximus* (Linnaeus, 1758)

World Range	South Asia, Myanmar, China, Indonesia, Borneo and Southeast Asia (Lekagul and McNeely, 1977; Corbet and Hill, 1992).
Thai Range	2,500–3,220 wild elephants are estimated to remain in 56 protected areas across Thailand (M. Srikrachang, pers. comm.). These numbers are provisional because formal census has not been attempted in any areas.
Conservation Status	• Globally Threatened - Endangered • At Risk In Lao PDR • CITES Appendix I • WARPA (1980): Protected-1 • Endangered in Thailand
Khao Yai	Widely distributed across the central portion of the park but scarce in the eastern sectors and the perimeter of the park (Trisurat *et al.*, 1996). 100–150 elephants are estimated for Khao Yai (Dobias, 1987) but these numbers are no more than guesses. Very low detection rate with camera-traps (RAI=0.4 ± 0.2 individuals /100 trapnights, n=121).
Thap Lan	Very low detection rate (RAI=0.1 ± 0.1 individuals /100 trapnights, n=21).
Pang Sida	Reported to occur (Mauric, 1996).
Ta Phraya	Old dung on trail near HQ on 10 August 1998.
Ecology	Restricted to less disturbed parts of DPKY. *E. maximus* favor mixed deciduous forest, but are also found in evergreen forest at lower densities (Lekagul and McNeely, 1977). Active throughout the daytime and nighttime (WCS, unpublished data).

Banteng *Bos javanicus* (d'Alton, 1823)

World Range	Myanmar, Thailand, Indochina, Java and Borneo; B. javanicus do not occur in Sumatra or Malaysia (Lekagul and McNeely, 1977).
Thai Range	Fewer than 500 wild *B. javanicus* are estimated for Thailand (Srikosamatara and Suteethorn, 1995). Half of these are found in Huai Kha Khaeng Wildlife Sanctuary, with a small number (c. 10) in Thap Lan and Pang Sida.
Conservation Status	• Globally Threatened - Endangered • At Risk In Lao PDR • WARPA (1980): Protected-2 • Critically Endangered in Thailand
Khao Yai	Not recorded from survey. No recent records of its presence and probably not occurring now.
Thap Lan	Reported to occur in the northern perimeter in open deciduous forest (Srikosamatara and Suteethorn, 1995; Kasetsart University, 1997).
Pang Sida	Reported to occur (Srikosamatara and Suteethorn, 1995; Mauric, 1996).
Ta Phraya	A small herd of up to 10 individuals reported to be present in low-lying heavily disturbed open forest near the entrance road (A. Jattupornpong, pers. comm., 1997).

Ecology — *B. javanicus* prefer open forests and swampy areas in the lowlands (Parr, 2004). Because of hunting pressure *B. javanicus* in many areas have become strictly nocturnal, spending the day in thick forest, coming out to graze only after dark.

Gaur *Bos gaurus*

World Range — Peninsular India north as far as Nepal, east throughout mainland Southeast Asia. It is not found on islands (Lekagul and McNeely, 1977).

Thai Range — In Thailand two subspecies are recognized: *B. g. readei* which occurs north of the Isthmus of Kra, and *B. g. hubbacki* found south of Isthmus of Kra. (Lekagul and McNeely, 1977). *B. gaurus* were once found throughout Thailand, but now number fewer than 1,000 individuals (Srikosamatara and Suteethorn, 1995) with c. 150 in the Dong Phayayen and San Kampaeng Ranges.

Conservation Status
- Globally Threatened - Vulnerable
- At Risk in Lao PDR
- CITES Appendix I
- WARPA (1980): Protected-2
- Vulnerable in Thailand

Khao Yai — Recorded from west and central portions of the park only with an additional small population in the far east of the park (Trisurat *et al.*, 1996). Their distribution is likely affected by availability of water and saltlicks (Sukmasuang *et al.*, 1995). Very low detection rate with camera-traps (RAI=0.7 ± 0.3 individuals /100 trapnights, n=121).

Thap Lan — Not recorded during survey but reported present.

Pang Sida — Reported to occur (Mauric, 1996).

Ta Phraya — A small herd of individuals reported to be present in low-lying heavily disturbed open forest near the entrance road (A. Jattupornpong, pers. comm., 1998). Seen during spotlight survey near Km 9 along the entrance road on 7 August 1998. Multiple sets of tracks recorded during survey near HQ.

Ecology — *B. gaurus* are highly threatened by poaching for commercial trade in meat and trophies. They are found in various forest types, feeding at night in deciduous forests, secondary growth, bamboo groves, and open areas. They inhabit forests of all elevations, resting in dense forest during the day. (Lekagul and McNeely, 1977). Camera-trap records indicate crepuscular behaviour at Khao Yai (WCS unpublished data).

Southern Serow *Naemorhedus sumatraensis*

World Range — N. India through the Himalayas to Assam, southern China, Myanmar, Vietnam, Lao PDR, Thailand, peninsular Malaysia, and Sumatra (Lekagul and McNeely, 1977).

Thai Range — In Thailand two subspecies are recognized: *N. s. milneedwardsi* N of Isthmus of Kra, and *N. s. sumatraensis* S of the Isthmus of Kra (Lekagul and McNeely, 1977).

Conservation Status
- Globally Threatened - Vulnerable
- Potentially At Risk In Lao PDR
- CITES Appendix I
- WARPA (1980): Reserved

Khao Yai Not recorded during initial surveys but later recorded in camera-traps at Khlong E-Tow and Khao Rom (Lynam *et al.*, 2003). Occurs in karst forests but is not limited to them.

Thap Lan Not recorded during survey but reported present.

Pang Sida Reported to occur (Mauric, 1996).

Ta Phraya Recorded by camera-traps on limestone escarpment west of HQ. Very low detection rate with camera-traps (RAI=0.07 ± 0.07 individuals / 100 trapnights, n=46).

Ecology In Thailand, highly susceptible to poaching for market trade in trophies (skins and horns), and traditional medicines (made from oil). *N. sumatraensis* typically inhabit steep limestone mountains and cliffs which are thickly clad with forest (Lekagul and McNeely, 1977).

Black Giant Squirrel *Ratufa bicolor*

World Range *R. bicolor* is known from E. Nepal, through Assam, Myanmar, S and W Yunnan, Thailand and Indochina to Peninsular Malaysia, Sumatra, Java, Bali, and small offshore islands (Lekagul and McNeely, 1977, Corbet and Hill 1992).

Thai Range Is widespread except for most of the northeastern Khorat Plateau. Lekagul and McNeely (1977) gave no information on the status of this squirrel in Thailand. Wiles (1981) found it to be the least common of the diurnal tree squirrels at Salak Phra Wildlife Sanctuary, Kanchanaburi Province, because of restrictive habitat requirements but it is probably also threatened by hunting in all parts of its range due to its large size and hence attractiveness as a food item.

Conservation Status
- Potentially At Risk In Lao PDR
- CITES Appendix II
- WARPA (1980): Protected-1

Khao Yai Frequently seen around the National Park HQ area.

Pang Sida Reported to occur (Mauric, 1996).

Ta Phraya Recorded by the bird survey team along the Chong Takhieu scarp.

Ecology *R. bicolor* is shy and found in various types of evergreen forest, mixed deciduous forest covering all altitudinal ranges, normally remaining in the canopy. Predominantly occurs in primary forest, possibly due to greater hunting pressure in edge and open habitats, though also found in secondary forest (Lekagul and McNeely 1977). Probably restricted to central parts of Khao Yai and other DPKY reserves where hunting pressure is lowest.

East Asian Porcupine *Hystrix brachyura*

World Range Nepal, NE India to China, through Indochina, SE Asia to Greater Sundas.

Thai Range	The species has a widespread distribution throughout Thailand found in all types of forest.
Conservation Status	• Globally Threatened - Vulnerable • WARPA (1980): Protected-1
Khao Yai	Frequently seen around the National Park HQ area. Low detection rate with camera-traps (RAI=2.5 ± 0.5 individuals /100 trapnights, n=121).
Thap Lan	Low detection rate (RAI=1.2 ± 0.8 individuals /100 trapnights, n=21).
Pang Sida	Reported to occur (Mauric, 1996).
Ta Phraya	Low detection rate (RAI=1.5 ± 0.7 individuals /100 trapnights, n=46).
Ecology	Widespread across DPKY, occurring in a range of disturbance conditions but subject to hunting, although populations may be resilient even in the face of heavy snaring (J.W. Duckworth pers. comm.). The IUCN conservation status may not be valid across most of its range. Chinese medicine uses flesh, stomach, and urine, of porcupines. Also hunted for meat. Primarily nocturnal in behaviour (WCS, unpublished data).

Other species records

These are key species for which no direct evidence was found, but which have been reported to occur in the DPKY.

Jungle Cat *Felis chaus*

World Range	Egypt north to the Caucasus, east through Iran, Afghanistan, Pakistan, India (except Kashmir) and Sri Lanka, Nepal and Bangladesh, to Myanmar, southern Yunnan, Indochina, and Thailand. (Corbet and Hill, 1992).
Thai Range	Lekagul and McNeely (1977) report this species as common but it has apparently declined in recent years (Graham & Round 1994). The only recent observation of this species from the wild comes from Thung Yai Naresuan Wildlife Sanctuary (Steinmetz & Mather 1996). Skins are occasionally recorded in border markets and live individuals, possibly taken from Myanmar or Cambodia, occasionally turn up in the Khao Khieo and Chiang Mai zoos (Duckworth et al. in press). The official Thai status is critically endangered (OEPP 1996) and evidence suggests the species is also declining across Indochina due to hunting and habitat destruction (Duckworth et al. in press).
Conservation Status	• At Risk In Lao PDR • CITES Appendix II • WARPA (1980): Protected-1 • Critically Endangered in Thailand
DPKY reserves	Reported to occur in Pang Sida (Mauric, 1996), Sakaerat (TISTR, 2001), and Thap Lan (Kasetsart University, 1997). Not reported for Khao Yai. Possibly also present in Ta Phraya.
Ecology	Possibly occurs in disturbed or secondary habitats. *F. chaus* are not found in dense forest, but in tall grasslands, deciduous forests, or thick bush; usually also in close proximity to canals or streams They may also come close to villages. They are more diurnal than other

species of cats, hunting both during day and night (Lekagul and McNeely, 1977).

Silvered Langur *Semnopithecus cristatus*

World Range	Discontinuous range in Bangladesh, southeastern Myanmar, Thailand, Cambodia, southern Vietnam, western peninsular Malaysia, Sumatra, Java, Borneo and small adjacent islands. (Lekagul and McNeely, 1977; Corbet and Hill, 1992).
Thai Range	Occurs in southeastern monsoonal evergreen forest, riverine forest and mixed decidous forest in western Thailand, and mangrove and adjacent monsoonal evergreen forest in peninsular Thailand (Parr, 2004).
Conservation Status	• At Risk In Lao PDR • CITES Appendix II • WARPA (1980): Protected-1
DPKY reserves	Reported to occur in Pang Sida (Mauric, 1996).
Ecology	Vulnerable due to hunting for food, their propensity for closed forest habitats, and by deforestation of their habitat (Lekagul and McNeely, 1977).

Bear Macaque *Macaca arctoides* (Linnaeus, 1766)

World Range	Southern China, Assam, Myanmar, Thailand and northern Malaysia.
Thai Range	Two subspecies are found in Thailand, *M. a. arctoides* on the Cambodian border, and *M. a. melanota* everywhere else (Lekagul and McNeely, 1977).
Conservation Status	• Globally threatened - Vulnerable • Potentially At Risk In Lao PDR • CITES Appendix II • WARPA (1980): Protected-1
DPKY reserves	Reported to occur in Pang Sida (Mauric, 1996).
Ecology	An upland species found in primary and secondary forests up to 2,000 m. It forms large groups and occasionally raids crops. As a result it is persecuted by farmers.

PART III. DISCUSSION

3.1 CONSTRAINTS ON SURVEYS AND INTERPRETATIONS OF RESULTS

For birds, the main 1999 survey period was during September to December. At that time of year, vocalising of some bird species was reduced compared with during the breeding season (which, for most forest birds, is during February to July). Many species were therefore probably under-recorded. This was particularly true for cuckoos, which have loud vocalisations during the breeding season and are much more easily detectable at that time.

Wet weather hampered survey efforts on the summit of Khao Rom and caused some reduction in bird activity and detectability. The latter part of the survey in Thap Lan took place during an unusual cool spell, with a cool northerly breeze, when daytime temperatures were hardly much above 15° C. This certainly caused some bird species to modify their behaviour. The normally arboreal Asian Brown Flycatchers *Muscicapa dauurica* were sitting on the surface of a laterite road, apparently foraging for insects at ground level. This atypical weather almost certainly inhibited calling, and in many species, reduced their detectability.

Ta Phraya was surveyed earlier in the season than either Khao Yai or Thap Lan, at a time when some winter visitors had not yet arrived. This means that the various diversity indices calculated for the Ta Phraya sites were lower than would have been the case had the survey been conducted later. This should be borne in mind when making comparisons across parks.

A representative selection of key habitats, with particular emphasis on under-recorded, lowland, riverine habitats and montane habitats, was covered during the survey. Ironically, the headquarters area was not covered in detail during the survey so that at present no comparative diversity measurements are available from that zone.

The total time spent in the field, and the geographical areas covered, were also rather limited. Many areas of all parks in DPKY would benefit from additional survey work.

For the mammals, the survey methods employed were biased toward the subset of non-volant, large mammals. Arboreal large mammals were surveyed but only in a relatively small area near the Khao Yai park headquarters (Lynam *et al.*, 2003). A greater survey effort involving spotlight surveys and direct observations would be needed across the larger forest complex to adequately document arboreal large mammals. Flying squirrels and bats were not assessed and would require additional dedicated survey efforts.

Species lists for large mammals should be considered preliminary for Thap Lan and Pang Sida since surveys did not include the entire range of habitats in those reserves (*e.g.* deciduous forest patches around the margins of these reserves were not sampled). Additional field effort in this middle section of the DPKY is recommended to determine the distribution of species identified from the initial survey efforts, and to elucidate the full complement of species there. Surveys at Khao Yai and Ta Phraya did attempt to capture the diversity of habitat and forest disturbance conditions, so these areas were adequately sampled geographically and in terms of habitat diversity.

3.2 AVIAN BIOGEOGRAPHY OF DPKY

The DPKY reserves comprise a finger of evergreen forest bordered by drier forest mosaic to the north and south (Fig. 1.). To the north extends the semi-arid Khorat plateau, now largely deforested, but once presumed to have been covered by a mosaic of chiefly deciduous woodland and grassland. To the south, DPKY is isolated from moister evergreen forests of the south-east, (centred on the Banthat mountain at the extreme SW of Cambodia, but including the montane outlier of Khao Soi Dao, Chanthaburi Province) by extensive lowlands along the Bang Pakong River flowing into the Gulf of Thailand, and by the drainage of the Great Lake basin of Cambodia, flowing to the east. Eastwards along the Phanom Dongrak escarpment, DPKY is connected to other evergreen forest areas, but this is also a narrow finger of evergreen similarly bordered with dry habitats. Though formerly connected to a minor exent with a mosaic of evergreen and decidous forest habitats along the eastern border of the country and the floodplain of the Mekong River mainstream, DPKY is nonetheless isolated from the large area of moist evergreen forest of the Annamite mountains.

Most lowland Indochinese moist forest species are absent from DPKY, though some (*e.g.*, Indochinese Magpie *Cissa hypoleuca*, Ochraceous Bulbul *Alophoixus ochraceus*) occur just across the Bang Pakong floodplain, in Khao Ang Ru Nai and Khao Soi Dao Wildlife Sanctuaries. Another, Bar-bellied Pitta *Pitta elliotii*, enters the Phanom Dongrak but is not known anywhere west of Yot Dom Wildlife Sanctuary, Ubon Ratchathani Province (Lekagul and Round, 1991). Those lowland Indochinese birds which occur in DPKY (*e.g.*, Moustached Hawk Cuckoo *Hierococcyx vagans* and Scaly-crowned Babbler *Malacopteron cinereum*) seem not to be limited to tall, mature moist forest but also occur in dry, low stature evergreen forest and successional habitats.

To the north-west of DPKY the Dong Phaya Fai Range extends southwards from the northern highlands, and contains significant areas of submontane evergreen forest and some areas > 1000 m elevation, but is not connected to DPKY and is separated from it by approximately 150 km of low elevation, drier terrain. Therefore, DPKY is an island of evergreen habitat which, even before man so radically transformed the surrounding landscape, probably was not larger than about c. 15,000 km^2.

DPKY, and in particular Khao Yai at its western end, is relatively rich in those evergreen forest species which have a wide altitudinal range across submontane and montane slopes. These include such species as Red-headed Trogon *Harpactes erythrocephalus*, Long-tailed Broadbill *Psarisomus dalhousiae*, Blue Pitta *Pitta cyanea*, Green Magpie *Cissa chinensis*, Black-throated Laughingthrush *Garrulax chinensis*, and others. Nonetheless, there are many other species which might be expected to occur but which are absent. These include many babblers, such as White-necked Laughingthrush *Garrulax strepitans*; Red-billed Scimitar Babbler *Pomatorhinus ochraceiceps*, Rufous-fronted Babbler *Stachyris rufifrons*, Grey-throated Babbler *S. nigriceps*, Brown-cheeked Fulvetta *Alcippe poioicephala*, White-hooded Babbler *Gampsorhynchus rufulus* and others. All of these species are found as far south along the Dong Phaya Fai at least as far as Phu Khieo Wildlife Sanctuary, Chaiyaphum Province, c. 16° 50' N.

Either many of these moist forest species never reached DPKY or (perhaps more likely) having done so in the past, when cover of moist evergreen forest reached its apogee, they

were subject to habitat restrictions, or climatic fluctuations leading later at times to very small areas of evergreen forest, and subsequently became extinct there.

Within DPKY exists an 'island' of montane habitat, all of which lies inside Khao Yai National Park on the mountains of Khao Khieo and Khao Rom. This habitat isolate is no larger than about 75 km^2 and it is not surprising that such a small isolate should be so species-poor. The only obligate montane species so far found at Khao Yai are White-browed and Chestnut-fronted Shrike Babblers, and White-tailed Leaf Warbler.

By contrast, Phu Khieo Wildlife Sanctuary, to the north of DPKY, supports many more strictly montane birds, including Flavescent Bulbul *Pycnonotus flavescens*, Mountain Bulbul *Hypsipetes mcclellandii*, and probably some of the montane babblers known from sites such as Phu Luang, further to the north. Unfortunately, the montane areas in Phu Khieo seem to have been too poorly surveyed for a complete inventory to be available. Khao Soi Dao (1670 m) likewise supports a relatively diverse montane avifauna, including species such as Lesser Shortwing *Brachypteryx leucophrys*, an endemic S Indochinese race of White-tailed Robin *Myiomela leucura cambodiana*, and more babblers (*e.g.*, Blue-winged Minla *Minla cyanouroptera*).

Buff-bellied Flowerpecker *Dicaeum ignipectus* is an example of an endemic south Indochinese subspecies of montane/upper submontane bird which occurs in Khao Yai. Birds in Khao Yai lack the red on the breast, showing characteristics of *D. i. cambodianum*, known from SW Cambodia and Khao Soi Dao. Most other South Indochinese montane species and subspecies are absent from Khao Yai (although it is possible that the White-tailed Leaf Warbler in Khao Yai may prove to be the S Indochinese race *klossi*).

Interestingly, a few evergreen montane and submontane species have populations both to the north, in the Dong Phaya Fai, at Phu Khieo or elsewhere, and at Khao Soi Dao in the South-east, but are absent from Khao Yai which lies between them. Among these are Dark-sided Thrush *Zoothera marginata*, White-tailed Robin, and Green Cochoa *Cochoa viridis*. Moreover, at either or both sites they often occur at elevations considerably lower than the summit of Khao Rom. Ostensibly, Khao Yai supports a large area of moist evergreen forest extending downslope from Khao Rom so there should be no constraint on the dispersal of montane species to lower elevations. The absence of these and other montane species from Khao Yai cannot be explained by the present condition of the habitat in Khao Yai, nor by any difference in elevation alone, compared with other sites. It is almost certain that, as with the lowland evergreen avifauna, the generally impoverished montane bird fauna of Khao Yai is due to it being too small a habitat isolate to support a large complement of montane species.

3.3 COMPLEMENTARITY AND CONSERVATION IMPORTANCE OF THE DPKY RESERVES FOR BIRDS

The key attributes of the avifaunas of DPKY reserves are summarised in Table 5. More species (358) have been recorded in Khao Yai than any other site, while fewest species have been recorded at Ta Phraya (201 species). These differences among sites are partly a function of the level of coverage, which is higher for Khao Yai than for other areas in DPKY. The smallest site, Sakaerat, which might be expected to have the smallest species total, has 220

Table 5. Attributes of bird assemblages in the Dong Phayayen - Khao Yai protected areas.

	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
No. confirmed species.	358	220	284	238	200
No. confirmed exclusive species (waterbirds and vagrants excluded)	31	0	4	1	1
No. confirmed landbirds (excluding waterbirds, vagrants)	315	215	260	228	181
No. probable additional landbird spp. (excluding vagrants)	12	69	67	82	108
Likely total landbirds (excluding vagrants)	327	284	327	310	289

species so far recorded. It too, is relatively well-covered. Thap Lan and Pang Sida are intermediate in species number (284 and 238 respectively).

The differences among sites can be better examined if most vagrants and waterbirds are excluded. A great many waterbirds are of only marginal occurrence in DPKY, but many have been recorded on reservoirs and lakes around park margins or, in the case of Khao Yai, around the headquarters. Excluding these species enables us to consider only landbird faunas. This reduces the Khao Yai total to 315 species, but causes correspondingly less reduction among other sites.

Khao Yai has many more exclusive species than any other site: 31 species compared with only four for Thap Lan, for example. Even so, this is still heavily biased by differences in coverage and many of these are are unlikely to be truly exclusive to Khao Yai.

Knowledge of the habitat preference and therefore probability of occurrence of other landbirds in each DPKY reserve enables us to compensate somewhat for these differences in coverage.

When likely probable species are added to the totals of landbirds for each reserve, this yields likely total landbirds and forest-associated species as 327 for both Khao Yai and Thap Lan; 310 species for Pang Sida, 289 species for Ta Phraya and 284 species for Sakaerat. This is roughly what we might expect from the species-area relation since Khao Yai and Thap Lan are the two largest sites (2,168 sq. km and 1,617 sq. km respectively) compared with 844 sq. km for Pang Sida, the next largest site (Table 1), and also have the greatest variety of habitats.

The similarity of likely species totals for Khao Yai and Thap Lan is at first sight surprising, especially since Khao Yai has a higher altitudinal range than Thap Lan. However, as already pointed out, the montane fauna of Khao Yai is depauperate so that the additional high elevation terrain adds few extra species. Thap Lan, by contrast, has a small area of habitat lacking in Khao Yai, dry dipterocarp woodland, and this contributes four species not found elsewhere: Rufous-bellied Woodpecker, Indochinese Cuckooshrike, White-browed Fantail and Great Tit, together with a few others which are also absent from Khao Yai (*e.g.*, Fulvous-breasted, Streak-throated and Black-headed Woodpeckers; Common Woodshrike and Chestnut-bellied Nuthatch) but which are shared with Sakaerat, the other site possessing dry dipterocarp.

The conservation attributes of the sites cannot be judged in terms of species richness alone. Very few hornbills were observed during the surveys of eastern Khao Yai, Thap Lan and Ta Phraya. Although the headquarters area and north-west portion of Khao Yai was not covered during the same time of year, the impression gained was that hornbill densities presented by Poonswad *et al.* (1987) for the headquarters area are markedly higher than those pertaining in many other areas of DPKY. Data presented by Trisurat *et al.*, (1996) appears to confirm this, showing that within Khao Yai hornbills were not evenly distributed and were markedly more abundant around the headquarters of the park. Within the context of DPKY, therefore, the western part of Khao Yai may have particular importance for hornbills and perhaps some other larger, more sensitive species of birds, and many large mammals (see also next section). Much of this difference may be due to differences in hunting pressure, since poaching appears to be lowest closer to the Khao Yai park headquarters (Lynam *et al.* 2003). But other factors may be implicated: the outlying areas of Khao Yai, and many parts of Thap Lan have been heavily logged, possibly rendering the habitat less suitable for hornbills and other frugivores. In addition, reduced rainfall with easterly progression along DPKY may lead to a gradual habitat transition, with a greater deciduous component in the forest. This might also bring about a reduction in the densities of some species.

Because of the extent of habitat remaining, DPKY seems likely to support some of the largest populations of lower hill-slope species remaining anywhere in the country. Perhaps pre-eminent among these is Siamese Fireback, since this species is essentially Indochinese in distribution and is limited to eastern regions of the country.

As elsewhere, populations of larger birds and mammals have been reduced due to a combination of habitat disturbance and hunting. Overall however, since habitat quality is high, there is a good possibility for some species to recolonise areas from which they have disappeared.

3.4 SIGNIFICANCE OF DPKY FOR MAMMALS

DPKY forms part of a globally significant ecoregion (Wikramanayake *et al.*, 2002) the conservation value of which is partly a result of the fact that it supports a largely intact large vertebrate fauna. Key Species identified by the ecoregion analysis for DPKY (Wikramanayake *et al.*, 2002) included Asian Elephant, Tiger *Panthera tigris*, Banteng *Bos javanicus*, Gaur *Bos gaurus*, Clouded Leopard *Neofelis nebulosa*, Leopard *Panthera pardus* and Sunbear *Ursus malayanus*. Each of these Globally Threatened or Near-Threatened species was represented in the surveys and will be considered in turn.

Probably 250-500 tigers remain in Thailand (Rabinowitz 1993a). Their precarious status is exacerbated by the fragmentation of the larger population into up to 15 smaller subpopulations (Smith *et al.*, 1999), each of which has a greater risk of local extinction because of smaller population size. Two of these subpopulations are in Khao Yai, and the remaining contiguous DPKY reserves. The subpopulations are effectively isolated by a major highway that runs between them from north to south. Considering the available habitat, Khao Yai should be able to support up to 32 tigers (Smith *et al.*, 1999) but surveys during 1997/8 detected 4-5 individuals near park headquarters (S. Wanghongsa pers. comm.); park-wide surveys during 1999-2002 detected only two individuals (Lynam *et al.*, 2003). Multiple camera-trap records of a single male Tiger were made from intensively managed grasslands

near the park headquarters during 1999–2002 but no further signs of Tigers have been recorded since March 2002. This suggests the Tiger population at Khao Yai may be extinct or close to local extinction. Prey densities are probably too low to support Tigers in Ta Phraya and adjacent Dong Yai Wildlife Sanctuary. Tigers were detected from the central part of Thap Lan but their distribution elsewhere at Thap Lan, and adjacent Pang Sida, is unconfirmed. Tiger tracks and signs are regularly reported from a reafforestation project run by Wildlife Fund Thailand in the western part of Thap Lan (M. Klinklay, pers. comm.) and it is possible the Tiger population in the Pang Sida/Thap Lan/Ta Phraya forest block is larger than in Khao Yai. Further surveys need to be done to establish the limits of Tiger distribution in the former area.

Leopards were recorded only from two locations at Ta Phraya, and, as for tigers, they are probably restricted by availability of large ungulate prey. Dholes were more widespread in DPKY reserves but nowhere common except in the area surrounding Khao Yai National Park headquarters. In reserves in India, Tiger, Dhole and Asiatic Leopard avoid competition by specializing or avoiding certain prey species (Karanth and Sunquist, 2000). In the DPKY reserves, prey availability is much reduced compared to Indian reserves. For example, in one of the richest and most protected areas for large mammals (Khlong E-Tow, Khao Yai; Trisurat *et al.*, 1996), Red Muntjac densities range from 0.9–1.9 individuals/km^2 (Lynam *et al.*, 2003) far lower than in Indian reserves with similar evergreen habitats (5.4 ± 0.52 individuals/km2 in Bhadra Reserve; Karanth and Nichols, 2000). Therefore, in the DPKY reserves these three large carnivores probably compete for prey, and because prey is limited, they do not co-occur. This is in contrast to the situation in parts of Kaeng Krachan National Park where surveys found all three species co-occurring (Ngoprasert & Lynam, 2002) and where prey is apparently abundant. Managed grasslands near Khao Yai headquarters support relatively high concentrations of Sambar (Trisurat *et al.*, 1996) and support a thriving Dhole population.

Large felids have apparently suffered seriously declines in the DPKY forest complex. While in the past direct poaching of felids reduced their populations, the removal of prey through poaching is possibly now the more serious threat. Unlike Myanmar and Cambodia where Tigers are direct targets for poachers because of their high commercial value (Bennett & Rao, 2002; Walston *et al.*, 2001), Thai poachers report that tigers are now rare and so are hunted only opportunistically, or are incidentally caught in traps set for other species. In either case, markets exist for large cat parts like hides, teeth and bone, and any animals secured by poachers would quickly find their way to Bangkok markets, and possibly overseas.

Other felids present in DPKY reserves include Clouded Leopard, Asian Golden Cat *Catopuma temmincki*, Leopard Cat *Prionailurus bengalensis* and Fishing Cat *P. viverinnus*. The first two are scarce but widespread across the reserves, while Leopard Cat are reasonably abundant and Fishing Cat extremely rare. Fishing Cat is not strictly a forest species, which might explain why it was not recorded by camera traps, which tended to be located in closed or open forest areas. Virtually nothing is known about the ecological requirements for any of these smaller felids. However, in general the requirements for felids would include available habitat, year-round availability of water, and prey. DPKY reserves, particularly those in the east, are heavily impacted by humans but still have potential to support felids if poaching of prey and damage to watersheds from activities like forest clearance can be stemmed. On a positive note, enforcement staff in Khao Yai and Ta Phraya have started to conduct systematic field exercises aimed at detecting and suppressing illegal forest clearance.

Populations of the medium and smaller felids are probably sufficient to make recovery if pressure on prey resources is released (Karanth & Stith, 1999). Whether or not there are sufficient numbers of larger felids in the DPKY reserves for their dwindling populations to recover will need to be determined by systematic monitoring.

Dhole populations appear disrupted and reduced in most DPKY reserves but dholes are now frequently observed in some parts of Khao Yai due to increased protection, abundant prey and a declining Tiger population, the only other large carnivore competitor. The apparent increase in Dhole abundance has alarmed park officials who maintain concern about the effect on populations of Sambar, which attract tourists. This has led to an unofficial policy to control Dhole populations in the park. However, Dhole populations are naturally controlled, as are all populations of carnivores, by natural fluctuations of prey (Begon *et al.* 1996). Interfering with the natural cycle of population change by culling carnivores can lead to population collapse, and trophic cascades that can lead to drastic ecological changes (Terborgh, 1990).

Asiatic black bears and sunbears were both recorded in DPKY reserves but are scarce except in parts of Khao Yai. Bears are poached for gall bladders and paws, items that are often seen in illegal markets, especially in border areas (WCS unpublished data), and reach urban black markets inside Thailand and beyond.

In addition to these species, surveys revealed some interesting new records. For example, Large-spotted Civet was recorded sympatrically with Large Indian Civet at Ta Phraya, adding to a handful of sites in Thailand/Indochina where the species are known to co-occur (Austin, 1999; Lynam *et al.*, in press). A possible future research initiative would be to study the ecological conditions under which the two species are able to coexist.

Another small carnivore of interest was Ferret-Badger *Melogale* spp. for which a single record was made from Khao Yai. The species is arboreal so that camera-trapping, which is normally used for assessing ground-frequenting species, may have underestimated its distribution. Spotlighting would be a more appropriate field method for assessing this species.

Apart from larger carnivores, other area-sensitive species that exist in the DPKY reserves include Asian Elephant, and wild cattle. Khao Yai reportedly supports the largest subpopulation (250 individuals) of wild Asian Elephants in Thailand (M. Srikrachang, pers. comm.). Elephants are concentrated in the centre and western portions of Khao Yai (Fig. 8a; Trisurat *et al.*, 1996) where the best protection is afforded by ranger patrols. Elsewhere in DPKY, elephants occur only in scattered and disrupted populations. For example, signs detected in Ta Phraya and Thap Lan during foot surveys were of single individuals or small numbers of elephants. Elephant populations have been decimated by poaching in the recent past. On the positive side some local poachers have been recruited to conservation programs and are engaged in wildlife monitoring activities. Further research is needed to establish population baselines and monitor human-elephant conflicts at reserve boundaries.

Gaur and Banteng have nationally significant populations in DPKY (Srikosamatara and Suteethorn, 1995). DPKY reserves possibly support >10% of the Thailand Gaur population (150 animals; Srikosamatara and Suteethorn, 1995), making this the second most important population after Huai Kha Khaeng. There were an estimated 10 bantengs in the eastern

DPKY reserves in 1995 but the population may in fact be larger. Gaur distribution is likely determined in part by the availability of mineral licks (Trisurat *et al.*, 1996). Gaurs and Bantengs are however subject to intense hunting pressure which has reduced their populations by 60% and 80% respectively in the last 20 years (Srikosamatara & Suteethorn, 1995). Camera-trap photographs of poachers carrying gaur heads were recorded during wildlife monitoring activities at Khao Yai (Lynam *et al.*, 2003) and continuing arrests of poachers with gaur meat in DPKY reserves indicate that direct poaching for trade continues to pose a threat to wild cattle populations.

Other focal species include primates. White-handed and Pileated Gibbons maintain healthy populations in the more protected western portion of Khao Yai around the park headquarters but are scarce elsewhere in DPKY. Pig-tailed Macaques are locally abundant in DPKY reserves but are absent from the eastern part of Khao Yai. Bear Macaques were not recorded but may occur in more open habitats near forest-farmland edges.

Park-wide surveys using camera-traps, direct observations and track and sign methods (Lynam *et al.*, 2003) revealed a similar pattern for large mammals; one of decreasing abundance with distance from central park protection facilities. Critical areas for Key Species of large mammals therefore would appear to coincide with places where human access is restricted or difficult rather than where unique or rare habitats persist. In Khao Yai, critical areas include dry evergreen forest/grassland habitats and associated mineral licks ranging from Khlong E-Tow eastwards to Khao Laem and south to Khao Samor Pun (Trisurat *et al.*, 1996). Other important areas are Thung Ngu Luam, Khlong Madeua and hill evergreen forests near Khao Rom Noi. To the east, secondary bamboo/ evergreen forests along the Thap Lan/Pang Sida border support large mammals. Small areas of deciduous dipterocarp woodland not surveyed here are reputed to support Banteng and are clearly important for birds (see previous section). Still further to the east, lowland plains forests east of Ta Phraya National Park HQ, and dry scrub forest on the karst escarpment west of the HQ are important. Areas further to the east near the Cambodia border have been largely emptied of large mammal faunas and no longer hold conservation value for them.

To summarise, the Dong Phayayen - Khao Yai Forest Complex is the sixth largest contiguous block of forest remaining in the country. While most of this area is evergreen or semi-evergreen, small areas of deciduous forest remain around the site margins and are among relatively few examples of plains forest remaining anywhare on Thailand's eastern plataeu. Some parts of the area, in eastern Khao Yai and in Thap Lan, support significant stretches of lowland riverine habitat which is under-represented among nature reserves in Thailand. Although the area is transected by roads, in most cases habitat patches are more or less linked by woody cover, plantations and regenerating secondary growth with gaps among sites ranging from a less than 100 m to no more than 1–2 km. At least for larger more mobile birds, and for large mammals, this should allow for dispersal among sites.

3.5 THREATS TO DPKY BIRDS AND MAMMALS

3.5.1 Aloewood and subsistence poaching

Of the many threats to wildlife in the DPKY, the collection of non-timber forest products (NTFP's) especially aloewood, but also including bamboo and rattan collection, puts wildlife

at risk. Many hundreds of NTFP collectors who intrude on Khao Yai on a daily basis (WCS/GSN, 1999) disturb wildlife and damage their habitats. For example, camera-traps recorded illegal human activity in all parts of the DPKY (Fig. 11) including poachers carrying guns, bags for collecting illegal products, and carcasses of wild animals. In some places such as eastern Khao Yai, poacher traffic was intense, poachers regularly passing in front of camera-traps apparently with total disregard for the fact that their forays were being recorded on film. Wildlife sensitive to human presence, especially tigers, elephants and wild cattle, avoid areas of human activity. Compounding this effect is the fact that people collecting NTFP's tend to also hunt for subsistence, taking whatever living animals they can catch in the timeframes in which they make their illegal forays into the forest (P. Klinklay, pers. comm.). As a result large areas of central and eastern Khao Yai, and the peripheries of all DPKY reserves, are devoid of large mammals and larger birds (Lynam *et al.*, 2003). Farmers living adjacent to DPKY reserves poach using extensive snarelines and pipebombs (especially around the north-east boundary of Khao Yai and around Ta Phraya) that kill wildlife indiscriminately. An effort to counter poaching has been initiated through the training of DPKY reserve rangers (WCS, 2002), and the implementation of a system of patrolling at Khao Yai through a wildlife protection programme called the Khao Yai Conservation Project. This was initiated by international conservation agencies WildAid and WCS, and the Royal Forest Department in 1999 (Lynam *et al.*, 2003; Spencer, 2000). However, antipoaching efforts need to be maintained and expanded to include all DPKY reserves in the complex if they are to be effective at reducing poaching to levels sustainable for wildlife.

3.5.2. Commercial poaching for wildlife trade

Domestic and international markets have long existed for wildlife poached in national forests (Martin & Redford, 2000; Round, 1990). A major market for the sale of wildlife is the Bangkok Weekend Market (Round, 1990) where live birds and reptiles, including hornbills, owls and songbirds, some reputed to be taken from Khao Yai, continue to be sold in contravention of national and international wildlife law (Bennett & Rao 2002; Round & Jukmongkol, 2002). In general, the hunting of wildlife is not done sustainably (Robinson & Sokhan, 1996; Robinson & Redford, 1994) and benefits not local people who hunt wildlife but the urban-based middlemen who control the trade. Suppression of the trade at its source and the establishment of systems for monitoring legal and illegal trade in wildlife (Round & Jukmongkol, 2002) would contribute to reducing the threat of commercial poaching.

3.5.3. Habitat loss and encroachment

Remaining areas for wildlife in Thailand are highly fragmented (Prayurasiddhi *et al.*, 1999) and are mostly too small to support species with large area requirements especially those that are sensitive to edge effects such as large carnivores (Woodroffe & Ginsberg, 1998). At 6,199 km^2, the DPKY is an important area of wildlife habitat in central Thailand that is also contiguous with habitats through western and central Cambodia. Following a ban on commercial logging in 1989, Thailand continued to lose forest at a rate of 0.73% per annum from 1990–2000 (FAO, 2001) as a result of continued encroachment around national forest reserves and outright habitat loss from forest clearance inside reserves. Forest encroachment remains a significant threat to wildlife in the DPKY. During the bird and large mammal surveys, local villagers supported by political activists were actively clearing forest 4km S

from the Ta Phraya National Park headquarters, while log poaching from nearby Dong Yai Wildlife Sanctuary continued to be a problem, requiring regular enforcement operations by forestry and border patrol police. Influential individuals continue to encroach on forest along the southern perimeter of Khao Yai. The formation of a combined police-forestry task force to combat encroachment is badly needed.

3.5.4. Grazing and fire

These factors both cause change in vegetation communities and forest structure at the edges of DPKY reserves which affect wildlife. DPKY reserves lack buffer zones so that areas containing wildlife lie immediately adjacent to areas where people conduct activities that are incompatible with wildlife conservation. For example, domestic cattle allowed to graze inside Ta Phraya National Park compete with gaurs and bantengs, and may transmit disease or parasites to populations of these wild cattle. Slash and burn techniques are employed to clear forest areas to expand areas of land under rice and other crops. Improved demarcation of DPKY reserve boundaries and active patrolling to suppress encroachment and habitat disturbance will be required to reduce these threats.

3.5.5. Access

All DPKY reserves are 'hard-edged' reserves where human settlements lie adjacent to wildlife habitat. A ringroad runs partially around Khao Yai, except in Prachantakham District, Prachinburi Province, where a local official has encroached upon the reserve. Multiple old logging tracks penetrate DPKY from the far east into Ta Phraya and Thap Lan. Major highways dissect DPKY into three portions; Khao Yai, Thap Lan/Pang Sida/western Ta Phraya, and eastern Ta Phraya. Military roads penetrate eastern areas of Ta Phraya. All of these roads provide convenient access for poachers and illegal loggers and facilitate the removal of wildlife.

3.5.6. Tourism

Management priorities for Thailand National Parks, especially Khao Yai, emphasize tourism rather than wildlife protection and conservation. Tourism is one means by which local people may benefit from a protected area (Brockelman & Dearden ,1990). If local communities receive financial incentives, either through direct sharing of profits with local people, or involvement of local people in trekking, white-water rafting, mountain bike riding, or other activities, wildlife may benefit. For example, at Ban Sap Tai, poaching of large mammals decreased and relations between park officials and locals improved after a nature trekking program was established (Brockelman & Dearden, 1990). Under the current management regime, local people usually do not share in the benefits from tourism.

One limit to the benefits from tourism is the capacity of an area to support visitors. Various tools for studying the impacts of tourism on wildlife and natural resources are available (Davenport *et al.*, 2002) but have never been applied for DPKY reserves. For example, Khao Yai receives >1.2 million visitors annually (Srikosamatara & Brockelman, 2002), and the recommendations of a National Park management plan (RFD, 1987) to zone sensitive areas for wildlife have never been implemented. Different species will be sensitive to different levels of disturbance and this needs to be taken into account when designing tourism projects.

3.5.7. Staff capacity

Park protection through enforcement and other mechanisms is a key to reducing loss of habitat and other threats in protected areas (Bruner *et al.*, 2001). All DPKY reserves have resident field staffs responsible for wildlife protection and monitoring, but these staff often lack training and/or are ill-equipped to conduct their work. This lack of capacity, along with lack of motivation and incentives, poses a significant threat to wildlife. In general, park rangers require training in law enforcement, community relations and basic wildlife identification in order to better protect and monitor wildlife and their habitats. Reserve managers and their assistants need training in wildlife research and ecology, as well as practical methods for managing personnel and resources. Staff training priorites need to emphasize the importance of wildlife. Fortunately, wildlife training programs adapted for use elsewhere in Asia are being implemented in Thailand with appropriate Thai-language handbooks and training materials (Kanwatanakid *et al.*, 2000; Rabinowitz, 1993b). For example, international conservation agencies WildAid and WCS have organized training for park rangers and facilitated the development of new protection and reporting systems for Khao Yai. Over thirty Khao Yai rangers received specialized training from Thai (Border Patrol Police) and international enforcement trainers during 1999–2002. In December 2001, 20 staff of four DPKY reserves participated in a 12-day intensive wildlife protection training course (WCS, 2002). Such training will need to be repeated at regular intervals to maintain staff capacity in the DPKY national parks and wildlife sanctuaries.

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APPENDIX 1. Comprehensive list of bird species in Dong Phayayen - Khao Yai Forest Complex by protected area unit.

Order and nomenclature follows Round (2000) except where marked *.

L&R Species number allotted in Lekagul and Round (1991) *A Guide to the Birds of Thailand*.

X Presence confirmed by substantiated records. All species-site records obtained during the survey are shaded.

Authorities for species not recorded during the current survey, or for which precise details are not held on file, are coded as follows:

1 Sight record/compilation for Thap Lan by Mr. Pornchai Wisutatharn
2 Listed by RFD Master Plan for Thap Lan NP
3 Listed by Nabhitabhata (1999) for Ta Phraya
4 Listed by RFD Master Plan for Pang Sida NP
5 Listed by Ngampongsai and Lauhachinda (1988) for Sakaerat
6 Sight record, Wichian Kongtong, for Sakaerat
7 Listed for Sakaerat by TISTR (2000)
Mc Listed for Khao Yai by McClure (1974)
RL Reliable local report

U Record considered unconfirmed

Status

R Resident: breeding population or presumed breeding population present in at least one UEFC site
N Non-breeding visitor
B Breeding visitor
P Passage migrant
V Vagrant; in most cases, species known from three or fewer records. Includes some species which are almost certainly more regular than present number of records indicate, as well as species which may overfly UEFC but for which the habitat within its boundaries is not considered to regularly support them.

Species shown in bold type are those which are either globally or nationally threatened or near-threatened

(See text or Appendix for further details)

next »

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
137	Chinese Francolin *Francolinus pintadeanus*	นกกระทาทุ่ง	R	X	X	X	X	
140	Blue-breasted Quail *Coturnix chinensis*	นกคุ่มสี	R	X			X	
131	Scaly-breasted Partridge *Arborophila chloropus*	นกกระทาดงแข้งเขียว	R	X	X	X	X	X
122	Red Junglefowl *Gallus gallus*	ไก่ป่า	R	X	X	X	X	X
119	Silver Pheasant *Lophura nycthemera*	ไก่ฟ้าหลังขาว	R	X		1	X	
121	**Siamese Fireback** ***Lophura diardi***	**ไก่ฟ้าพญาลอ**	R	X	X	X	X	X
127	**Green Peafowl** ***Pavo muticus***	**นกยูง**	R			1	RL	RL
67	Lesser Whistling-duck *Dendrocygna javanica*	เป็ดแดง	R	X		1	X	X
65	**[White-winged Duck** ***Cairina scutulata]***	**เป็ดก่า**		U				
64	**[Comb Duck** ***Sarkidiornis melanotis]***	**เป็ดหงส์**						U3
63	Cotton Pygmy-goose *Nettapus coromandelianus*	เป็ดคับแค	Vagrant	Mc		1		
142	Yellow-legged Buttonquail *Turnix tanki*	นกคุ่มอีดใหญ่	R	X	X	1		
143	Barred Buttonquail *Turnix suscitator*	นกคุ่มอกลาย	R	X	X	1	X	X

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
394	White-browed Piculet *Sasia ochracea*	นกหัวขวานจิ๋วคิ้วขาว	R	X		2	X	
427	Grey-capped Woodpecker *Dendrocopos canicapillus*	นกหัวขวานด่างแคระ	R	X	X	X		X
425	Fulvous-breasted Woodpecker *Dendrocopos macei*	นกหัวขวานด่างอกลายจุด	R		X	X		
423	**Rufous-bellied Woodpecker** ***Dendrocopos hyperythrus***	**นกหัวขวานด่างท้องน้ำตาลแดง**	R			X		
412	Rufous Woodpecker *Celeus brachyurus*	นกหัวขวานสีตาล	R	X	X	2	X	X
416	**White-bellied Woodpecker** ***Dryocopus javensis***	**นกหัวขวานใหญ่สีดำ**	R	Mc	X	X		
408	Lesser Yellownape *Picus chlorolophus*	นกหัวขวานเล็กหงอนเหลือง	R	X	X	X	X	
407	Greater Yellownape *Picus flavinucha*	นกหัวขวานใหญ่หงอนเหลือง	R	X	X	X	X	X
402	Laced Woodpecker *Picus vittatus*	นกหัวขวานเขียวป่าไผ่	R	X	X	X	X	X
404	**Streak-throated Woodpecker** ***Picus xanthopygaeus***	**นกหัวขวานเขียวท้องลาย**	R	X	X	U		
406	**Black-headed Woodpecker** ***Picus erythropygius***	**นกหัวขวานเขียวตะโพกแดง**	R	U	X	X		
405	Grey-headed Woodpecker *Picus canus*	นกหัวขวานเขียวหัวดำ	R	X		X	X	X
398	Common Flameback *Dinopium javanense*	นกหัวขวานสามนิ้วหลังทอง	R	X	X	X	X	X

« previous description next »

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
397	Greater Flameback *Chrysocolaptes lucidus*	นกหัวขวานสี่นิ้วหลังทอง	R	X	X	X	X	X
401	[Bamboo Woodpecker *Gecinulus viridis*]	นกหัวขวานป่าไผ่		U				
419	Black-and-buff Woodpecker *Meiglyptes jugularis*	นกหัวขวานด่างท้องดำ	R	X		X	X	
420	Heart-spotted Woodpecker *Hemicircus canente*	นกหัวขวานแคระจุดรูปหัวใจ	R	X	X	X	X	X
415	**Great Slaty Woodpecker** ***Mulleripicus pulverulentus***	**นกหัวขวานใหญ่สีเทา**	R	X	7	X	X	
379	Lineated Barbet *Megalaima lineata*	นกโพระดกธรรมดา	R	X	X	X	X	X
380	Green-eared Barbet *Megalaima faiostricta*	นกโพระดกหูเขียว	R	X	X	X	X	X
386	Moustached Barbet *Megalaima incognita*	นกโพระดกคอสีฟ้าเคราดำ	R	X	X	X	X	3
388	Blue-eared Barbet *Megalaima australis*	นกโพระดกหน้าผากดำ	R	X	X	X	X	X
389	Coppersmith Barbet *Megalaima haemacephala*	นกตีทอง	R	X	X	X	X	X
374	**Oriental Pied Hornbill** ***Anthracoceros albirostris***	**นกแก๊ก, นกแกง**	R	X	7	X	X	X
376	**Great Hornbill** ***Buceros bicornis***	**นกกก, นกกาฮัง**	R	X		1	X	3
367	**Brown Hornbill** ***Anorrhinus tickelli***	**นกเงือกสีน้ำตาลคอขาว**	R	X		RL		

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
371	**Wreathed Hornbill** ***Aceros undulatus***	**นกเงือกกรามช้าง**	R	X		X	X	
365	Hoopoe *Upupa epops*	นกกะรางหัวขวาน	R, N	X	X	X	X	X
340	Orange-breasted Trogon *Harpactes oreskios*	นกขุนแผนอกสีส้ม	R	X	X	X	X	X
341	Red-headed Trogon *Harpactes erythrocephalus*	นกขุนแผนหัวแดง	R	X		1	X	
363	Indian Roller *Coracias benghalensis*	นกตะขาบทุ่ง	R	X	X	X	X	X
364	Dollarbird *Eurystomus orientalis*	นกตะขาบดง	R	X	X	1	X	X
345	Common Kingfisher *Alcedo atthis*	นกกะเต็นน้อยธรรมดา	N	X	X	X	X	X
346	Blue-eared Kingfisher *Alcedo meninting*	นกกะเต็นน้อยหลังสีน้ำเงิน	R	X		1	X	X
348	Black-backed Kingfisher *Ceyx (e.) erithacus*	นกกะเต็นน้อยหลังดำ	R,N	X	X	X	X	
349	Banded Kingfisher *Lacedo pulchella*	นกกะเต็นลาย	R	X	X	X	X	X
351	Stork-billed Kingfisher *Halcyon capensis*	นกกะเต็นใหญ่ธรรมดา	R	X	X	1	X	3
352	Ruddy Kingfisher *Halcyon coromanda*	นกกะเต็นแดง	Vagrant	X				
353	White-throated Kingfisher *Halcyon smyrnensis*	นกกะเต็นอกขาว	R	X	X	X	X	X

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
354	Black-capped Kingfisher *Halcyon pileata*	นกกะเต็นหัวดำ	N	X	X	X	X	X
362	Blue-bearded Bee-eater *Nyctyornis athertoni*	นกจาบคาเคราน้ำเงิน	R	X	X	1	X	X
359	Green Bee-eater *Merops orientalis*	นกจาบคาเล็ก	R	X	X	X	X	X
360	Blue-throated Bee-eater *Merops viridis*	นกจาบคาคอสีฟ้า	N	X		1	X	X
358	Blue-tailed Bee-eater Merops philippinus	นกจาบคาหัวเขียว	N	X	7	1	X	
357	Chestnut headed Bee-eater *Merops leschenaulti*	นกจาบคาหัวสีส้ม	R	X	X	X	X	X
281	Chestnut-winged Cuckoo *Clamator coromandus*	นกคัคคูหงอน	B	X	X		X	
282	Large Hawk Cuckoo *Hierococcyx sparverioides*	นกคัคคูเหยี่ยวใหญ่	N	X	X	1		
284	Moustached Hawk Cuckoo *Hierococcyx vagans*	นกคัคคูเหยี่ยวเล็ก	R					X
285	Hodgson's Hawk Cuckoo *Hierococcyx fugax*	นกคัคคูเหยี่ยวอกแดง	R	X			X	
286	Indian Cuckoo *Cuculus micropterus*	นกคัคคูพันธุ์อินเดีย	R	X	X		X	X
288	Oriental Cuckoo *Cuculus saturatus*	นกคัคคูพันธุ์หิมาลัย	N	X		1		
290	Banded Bay Cuckoo *Cacomantis sonneratii*	นกคัคคูลาย	R	X	X	X	X	X

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L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
291	Plaintive Cuckoo *Cacomantis merulinus*	นกอีวาบตั๊กแตน	R	X	X	1	X	X
293	Asian Emerald Cuckoo *Chrysococcyx maculatus*	นกคัคคูมรกต	N	X	X	1		
294	Violet Cuckoo *Chrysococcyx xanthorhynchus*	นกคัคคูสีม่วง	R	X	6		X	
296	Drongo Cuckoo *Surniculus lugubris*	นกคัคคูแซงแซว	R	X	X	1	X	
297	Asian Koel *Eudynamys scolopacea*	นกกาเหว่า	R	X	X	X	X	X
300	Green-billed Malkoha *Phaenicophaeus tristis*	นกบั้งรอกใหญ่	R	X	X	X	X	X
304	**Coral-billed Ground Cuckoo** ***Carpococcyx renauldi***	**นกโกโรโกโส**	R	X	7		X	3
305	Greater Coucal *Centropus sinensis*	นกกระปูดใหญ่	R	X	X	X	X	X
306	Lesser Coucal *Centropus bengalensis*	นกกระปูดเล็ก	R	X	X	1	X	3
279	Vernal Hanging Parrot *Loriculus vernalis*	นกหกเล็กปากแดง	R	X	X	X	X	X
274	**[Alexandrine Parakeet** ***Psittacula eupatria]***		R		U7			
276	**Blossom-headed Parakeet** ***Psittacula roseata***	**นกแก้วหัวแพร**	R	X	X	X	X	
275	Red-breasted Parakeet *Psittacula alexandri*	นกแขกเต้า	R	X	X	X	X	X

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L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
449	Himalayan Swiftlet *Aerodramus brevirostris*	นกแอ่นพันธุ์หิมาลัย	N	X		1		
456	White-throated Needletail *Hirundapus caudacutus*	นกแอ่นใหญ่คอขาว	N	X				
457	Silver-backed Needletail *Hirundapus cochinchinensis*	นกแอ่นใหญ่หัวตาดำ	(R)	X	5	X		
458	Brown-backed Needletail *Hirundapus giganteus*	นกแอ่นใหญ่หัวตาขาว	R	X	X	X	X	X
451	Asian Palm Swift *Cypsiurus balasiensis*	นกแอ่นตาล	R	X	X	X	X	X
454	Pacific Swift *Apus pacificus*	นกแอ่นตะโพกขาว หางแฉก	N	X	X		X	X
455	House Swift *Apus nipalensis*	นกแอ่นบ้าน	R	X	X	1	X	X
459	Crested Treeswift *Hemiprocne coronata*	นกแอ่นฟ้าหงอน	R	X	X	X	X	X
307	Barn Owl *Tyto alba*	นกแสก	R				X	X
308	Oriental Bay Owl *Phodilus badius*	นกแสกแดง	R	X	X	X		X
312	Mountain Scops Owl *Otus spilocephalus*	นกเค้าภูเขา	R	X	X			
313	Oriental Scops Owl *Otus sunia*	นกเค้าหูยาวเล็ก	R,N	X	X	X	X	X
314	Collared Scops Owl *Otus bakkamoena*	นกฮูก, นกเค้ากู่	R	X	X	X	X	X
318	**Spot-bellied Eagle Owl** ***Bubo nipalensis***	**นกเค้าใหญ่** **พันธุ์เนปาล**	R	X			X	

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
321	Brown Fish Owl *Ketupa zeylonensis*	นกทึดทือพันธุ์เหนือ	R	X				
322	Buffy Fish Owl *Ketupa ketupu*	นกทึดทือมลายู	R	X				
323	Brown Wood Owl *Strix leptogrammica*	นกเค้าป่าสีน้ำตาล	R	X	X			3
315	Collared Owlet *Glaucidium brodiei*	นกเค้าแคระ	R	X		X	X	
316	Asian Barred Owlet *Glaucidium cuculoides*	นกเค้าโมง, นกเค้าแมว	R	X	X	X	X	X
317	Spotted Owlet *Athene brama*	นกเค้าจุด	R	X	X	1	X	X
309	Brown Boobook Ninox scutulata	นกเค้าเหยี่ยว	R	X	X	X	X	X
329	**Javan Frogmouth *Batrachostomus javensis***	**นกปากกบพันธุ์ชวา**	R	X	X			
330	Great Eared Nightjar *Eurostopodus macrotis*	นกตบยุงยักษ์	R	X	X	X	X	X
332	Grey Nightjar *Caprimulgus indicus*	นกตบยุงภูเขา	N	X		X	X	3
333	Large-tailed Nightjar *Caprimulgus macrurus*	นกตบยุงหางยาว	R	X	X	X	X	X
335	Savanna Nightjar *Caprimulgus affinis*	นกตบยุงป่าโคก	R	U	1	X		
262	Rock Pigeon *Columba livia*	นกพิราบป่า	R	X	X	X	X	X
265	**Pale-capped Pigeon *Columba punicea***	**นกลุมพูแดง**	N?	X				

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L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
268	Oriental Turtle Dove *Streptopelia orientalis*	นกเขาพม่า	N	X				
270	Spotted Dove *Streptopelia chinensis*	นกเขาใหญ่, นกเขาหลวง	R	X	X	X	X	X
269	Red Collared Dove *Streptopelia tranquebarica*	นกเขาไฟ	R	X	X	X	X	X
266	Barred Cuckoo Dove *Macropygia unchall*	นกเขาลายใหญ่	R	X		2	X	3
272	Emerald Dove *Chalcophaps indica*	นกเขาเขียว	R	X	X	X	X	X
271	Zebra Dove *Geopelia striata*	นกเขาชวา	R			X	X	X
255	**Orange-breasted Pigeon** **Treron bicincta**	**นกเปล้า** ***อกสีม่วงน้ำตาล***	R	X			4	
251	**Pompadour Pigeon** ***Treron pompadora***	**นกเปล้าหน้าเหลือง**	R	X	X		X	3
250	Thick-billed Pigeon *Treron curvirostra*	นกเขาเปล้า	R	X	X	X	X	X
257	[Yellow-footed Pigeon *Treron phoenicoptera]*		R	U				
246	Pin-tailed Pigeon *Treron apicauda*	นกเปล้าหางเข็ม	N	X				
248	Wedge-tailed Pigeon *Treron sphenura*	นกเปล้าหางพลั่ว	R	X				
249	**White-bellied Pigeon** ***Treron sieboldii***	**นกเปล้าท้องขาว**	R	X				

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259	**Green Imperial Pigeon** *Ducula aenea*	**นกลุมพู**	R	X		X	X	X
261	Mountain Imperial Pigeon *Ducula badia*	นกมูม	R	X	X	X	X	U3
159	**Masked Finfoot** ***Heliopais personata***	**นกฟินฟุต**	Vagrant	X				
147	Slaty-legged Crake *Rallina eurizonoides*	นกอัญชันป่าขาเทา	N	X			X	
154	White-breasted Waterhen *Amaurornis phoenicurus*	นกกวัก	R	X	X	X	X	X
150	Ruddy-breasted Crake *Porzana fusca*	นกหนูแดง	N	X				
156	Common Moorhen *Gallinula chloropus*	นกอีล้ำ	N	X		X	X	
206	Eurasian Woodcock *Scolopax rusticola*	นกปากซ่อมดง	N	X			X	
208	Pintail Snipe *Gallinago stenura*	นกปากซ่อมหางเข็ม	N	X		X	X	3
176	Whimbrel *Numenius phaeopus*	นกอีก๋อยเล็ก	Vagrant	X				
182	Spotted Redshank *Tringa erythropus*	นกทะเลขาแดงลายจุด	Vagrant	X				
186	Marsh Sandpiper *Tringa stagnatilis*	นกชายเลนบึง	Vagrant	Mc				
187	Green Sandpiper *Tringa ochropus*	นกชายเลนเขียว	Vagrant	X				X

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188	Wood Sandpiper *Tringa glareola*	นกชายเลนน้ำจืด	Vagrant	X		1		3
189	Common Sandpiper *Actitis hypoleucos*	นกเด้าดิน	N	X		X	X	X
160	**Pheasant-tailed Jacana** ***Hydrophasianus chirurgus***	**นกอีแจว**	Vagrant			1		
161	Bronze-winged Jacana *Metopidius indicus*	นกพริก	Vagrant?			1		
215	Black-winged Stilt *Himantopus himantopus*	นกตีนเทียน	Vagrant	Mc		1		
167	Pacific Golden Plover *Pluvialis fulva*	นกหัวโตหลังจุดสีทอง	Vagrant	X				
163	**Grey-headed Lapwing** ***Vanellus cinereus***	**นกกระแตหัวเทา**	Vagrant	X				
164	Red-wattled Lapwing *Vanellus indicus*	นกกระแตแต้แว้ด	R	X	X	1	X	X
213	Oriental Pratincole *Glareola maldivarum*	นกแอ่นทุ่งใหญ่	Vagrant	X				
214	Small Pratincole *Glareola lactea*	นกแอ่นทุ่งเล็ก	Vagrant			X		
241	Whiskered Tern *Chlidonias hybridus*	นกนางนวลแกลบเคราขาว	Vagrant					X
240	White-winged Tern *Chlidonias leucopterus*	นกนางนวลแกลบดำปีกขาว	Vagrant	X				
68	Osprey *Pandion haliaetus*	เหยี่ยวออสเปร	N	X		X	X	3

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72	**Jerdon's Baza** ***Aviceda jerdoni***	**เหยี่ยวกิ้งก่าสีน้ำตาล**	B	X		2	X	
73	Black Baza *Aviceda leuphotes*	เหยี่ยวกิ้งก่าสีดำ	N, R	X	X	X	X	X
81	Oriental Honey-buzzard *Pernis ptilorhyncus*	เหยี่ยวผึ้ง	N, R	X	X	2	X	X
69	Black-shouldered Kite *Elanus caeruleus*	เหยี่ยวขาว	R	X	X			
70	**Black Kite** ***Milvus migrans***	**เหยี่ยวดำ**	N	X	X			
71	**Brahminy Kite** ***Haliastur indus***	**เหยี่ยวแดง**	Vagrant				X	3
87	**Grey-headed Fish Eagle** ***Ichthyophaga ichthyaetus***	**เหยี่ยวปลาใหญ่หัวเทา**	R	X				
89	Short-toed Eagle *Circaetus gallicus*	เหยี่ยวนิ้วสั้น	Vagrant	X				
90	Crested Serpent *Eagle Spilornis cheela*	เหยี่ยวรุ้ง	R	X	X	X	X	X
106	Eastern Marsh Harrier *Circus spilonotus*	เหยี่ยวทุ่ง พันธุ์เอเชียตะวันออก	N	X		1		
07	Hen Harrier *Circus cyaneus*	เหยี่ยวทุ่งแถบเหนือ	Vagrant	X				
108	Pied Harrier *Circus melanoleucos*	เหยี่ยวด่างดำขาว	N	X			X	
74	Crested Goshawk *Accipiter trivirgatus*	เหยี่ยวนกเขาหงอน	R	X		X	X	X

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78	Shikra *Accipiter badius*	เหยี่ยวนกเขาชิครา	R	X	X	X	X	X
77	[Chinese Sparrowhawk *Accipiter soloensis]*	เหยี่ยวนกเขาพันธุ์จีน		U				U3
80	Japanese Sparrowhawk *Accipiter gularis*	เหยี่ยวนกเขาพันธุ์ญี่ปุ่น	N	X	X		X	X
79	Besra *Accipiter virgatus*	เหยี่ยวนกกระจอกเล็ก	R	X		1	X	
76	[Eurasian Sparrowhawk *Accipiter nisus]*	เหยี่ยวนกกระจอกใหญ่		U			U	
83	**Rufous-winged Buzzard** ***Butastur liventer***	**เหยี่ยวปีกแดง**	R	Mc	X	X	X	X
84	Grey-faced Buzzard *Butastur indicus*	เหยี่ยวหน้าเทา	N	X		1		
82	Common Buzzard *Buteo buteo*	เหยี่ยวทะเลทราย	N	X				
98	**Black Eagle** ***Ictinaetus malayensis***	**นกอินทรีดำ**	R	X		X	X	
101	Imperial Eagle *Aquila heliaca*		Vagrant	X				
97	Booted Eagle Hieraaetus pennatus	นกอินทรีเล็ก	Vagrant	X				
95	Rufous-bellied Eagle *Hieraaetus kienerii*	เหยี่ยวท้องแดง	R	X				
92	Changeable Hawk Eagle *Spizaetus cirrhatus*	เหยี่ยวต่างสี	R	X	5		X	

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91	**Mountain Hawk Eagle** ***Spizaetus nipalensis***	**เหยี่ยวภูเขา**	R	X		X		X
109	**White-rumped Falcon** *Polihierax insignis*	**เหยี่ยวเล็กตะโพกขาว**	R		5,6	X		
110	Collared Falconet *Microhierax caerulescens*	เหยี่ยวแมลงปอขาแดง	R	X	X	X		
112	Common Kestrel *Falco tinnunculus*	เหยี่ยวเคสเตรล	N	X		1		
115	Oriental Hobby *Falco severus*	เหยี่ยวฮอบบี้	R	X		1		
116	Peregrine Falcon *Falco peregrinus*	เหยี่ยวเพเรกริน	R,N	X				
1	Little Grebe *Tachybaptus ruficollis*	นกเป็ดผีเล็ก	R	X		1		X
6	**Oriental Darter** ***Anhinga melanogaster***	**นกอ้ายงั่ว**	N	X				
5	Little Cormorant *Phalacrocorax niger*	นกกาน้ำเล็ก	N	X		1		
24	Little Egret *Egretta garzetta*	นกยางเปีย	N	X		X		X
15	Grey Heron *Ardea cinerea*	นกกระสานวล	N	X		1		3
16	Purple Heron *Ardea purpurea*	นกกระสาแดง	N	X		1		
19	Cattle Egret *Bubulcus ibis*	นกยางควาย	N	X		1	X	3

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17	Chinese Pond Heron *Ardeola bacchus*	นกยางกรอกพันธุ์จีน	N	X	X	X	X	X
25	Little Heron *Butorides striatus*	นกยางเขียว	N	X	X	X	X	X
27	Black-crowned Night Heron *Nycticorax nycticorax*	นกแขวก	N			1		
28	**Malayan Night Heron** ***Gorsachius melanolophus***	**นกยางลายเสือ**	R	X			X	
29	Yellow Bittern *Ixobrychus sinensis*	นกยางไฟหัวดำ	R,N	X		1	X	3
30	**Schrenck's Bittern** ***Ixobrychus eurhythmus***	**นกยางไฟหัวเทา**	Vagrant	X				
31	Cinnamon Bittern *Ixobrychus cinnamomeus*	นกยางไฟธรรมดา	R,N	X		1	X	3
26	Black Bittern *Dupetor flavicollis*	นกยางดำ	Vagrant	X		1		
42	**Spot-billed Pelican** ***Pelecanus philippensis***	**นกกระทุง**	Vagrant	X		X		RL
34	**Asian Openbill** ***Anastomus oscitans***	**นกปากห่าง**	Vagrant	X				X
36	**Black Stork** *Ciconia nigra*	**นกกระสาดำ**	Vagrant	X				
37	**[Woolly-necked Stork** ***Ciconia episcopus]***	**นกกระสาคอขาว**	R					U3
40	**Lesser Adjutant** ***Leptoptilos javanicus***	**นกตะกรุม**	Vagrant	X				

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39	**Greater Adjutant** ***Leptoptilos dubius***	**นกตะกราม**	Vagrant	X				
446	Eared Pitta *Pitta phayrei*	นกแต้วแล้วหูยาว	R	X	X		X	X
443	Blue Pitta *Pitta cyanea*	นกแต้วแล้วสีน้ำเงิน	R	X		1	X	
441	Hooded Pitta *Pitta sordida*	นกแต้วแล้วอกเขียว	B	X			X	
438	Blue-winged Pitta *Pitta moluccensis*	นกแต้วแล้วธรรมดา	B	X		2	X	
428	Dusky Broadbill *Corydon sumatranus*	นกพญาปากกว้างสีดำ	R	X	X	2	X	
429	**[Black-and-red Broadbill** ***Cymbirhynchus macrorhynchos]***	**นกพญาปากกว้างท้องแดง**	R					
430	Banded Broadbill *Eurylaimus javanicus*	นกพญาปากกว้างลายเหลือง	R	X	X	X	X	X
432	Silver-breasted Broadbill *Serilophus lunatus*	นกพญาปากกว้างอกสีเงิน	R	X		1	X	X
433	Long-tailed Broadbill *Psarisomus dalhousiae*	นกพญาปากกว้างหางยาว	R	X		X	X	
559	Asian Fairy Bluebird *Irena puella*	นกเขียวคราม	R	X	X	X	X	X
509	Blue-winged Leafbird *Chloropsis cochinchinensis*	นกเขียวก้านตองปีกสีฟ้า	R	X	X	X	X	X
508	Golden-fronted Leafbird *Chloropsis aurifrons*	นกเขียวก้านตองหน้าผากสีทอง	R	X	X	X	X	X

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816	*Tiger Shrike* *Lanius tigrinus*	*นกอีเสือลายเสือ*	*P*	*X*	*X*		*X*	*X*
815	Brown Shrike *Lanius cristatus*	นกอีเสือสีน้ำตาล	N	X	X	X	X	X
817	Burmese Shrike *Lanius collurioides*	นกอีเสือหลังแดง	N	X	X	X		X
819	Long-tailed Shrike *Lanius schach*	นกอีเสือหัวดำ	R	X		1	X	
818	Grey-backed Shrike *Lanius tephronotus*	นกอีเสือหลังเทา	N	X		X		
561	Eurasian Jay *Garrulus glandarius*	นกปีกลายสก๊อต	R	Mc	X	X	X	
564	Blue Magpie *Urocissa erythrorhyncha*	นกขุนแผน	R			1	X	X
563	Green Magpie *Cissa chinensis*	นกสาลิกาเขียว	R	X	X	2	X	X
565	Rufous Treepie *Dendrocitta vagabunda*	นกกะลิงเขียด	R		76	X		X
567	Racket-tailed Treepie *Crypsirina temia*	นกกาแวน	R	X	X	X	X	X
569	Large-billed Crow *Corvus macrorhynchos*	อีกา	R	X	X	X	X	X
820	Ashy Woodswallow *Artamus fuscus*	นกแอ่นพง	R	X	X	1	X	X
554	Black-naped Oriole *Oriolus chinensis*	นกขมิ้นท้ายทอยดำ	N	X	X	X	X	X

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555	Slender-billed Oriole *Oriolus tenuirostris*		N	X			U	U3
556	Black-hooded Oriole *Oriolus xanthornus*	นกขมิ้นหัวดำใหญ่	R	U	X	X	4	
557	Maroon Oriole *Oriolus traillii*	นกขมิ้นแดง	N	X				
558	**Silver Oriole** ***Oriolus mellianus***	**นกขมิ้นขาว**	N	X				
490	Large Cuckooshrike *Coracina macei*	นกขี้เถ้าใหญ่	R		X	X	X	3
492	Indochinese Cuckooshrike *Coracina polioptera*	นกเฉี่ยวบุ้งกลาง	R	U	7	X		
493	Black-winged Cuckooshrike *Coracina melaschistos*	นกเฉี่ยวบุ้งใหญ่	N	X	X	X	X	
496	Rosy Minivet *Pericrocotus roseus*	นกพญาไฟสีกุหลาบ	N	X	X	X		3
496	**Brown-rumped Minivet** ***Pericrocotus cantonensis***	**นกพญาไฟตะโพกสีน้ำตาล**	N	X	X	X	X	
495	Ashy Minivet *Pericrocotus divaricatus*	นกพญาไฟสีเทา	N	X	X	X	X	3
497	Small Minivet *Pericrocotus cinnamomeus*	นกพญาไฟเล็ก	R		X	X		
502	Scarlet Minivet *Pericrocotus flammeus*	นกพญาไฟใหญ่	R	X	X	X	X	X
486	Bar-winged Flycatcher-shrike *Hemipus picatus*	นกเขนน้อยปีกแถบขาว	R	X	X	X	X	X

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806	**White-browed Fantail** ***Rhipidura aureola***	**นกอีแพรดคิ้วขาว**	R			X		
808	Pied Fantail *Rhipidura javanica*	นกอีแพรดแถบอกดำ	R	X	X	X	X	X
546	Black Drongo Dicrurus macrocercus	นกแซงแซวหางปลา	R,N	X	X	X	X	3
547	Ashy Drongo *Dicrurus leucophaeus*	นกแซงแซวสีเทา	R,N	X	X	X	X	X
548	Crow-billed Drongo *Dicrurus annectans*	นกแซงแซวปากกา	P	X		1	X	
549	Bronzed Drongo *Dicrurus aeneus*	นกแซงแซวเล็กเหลือบ	R	X	X	X	X	X
550	Lesser Racket-tailed Drongo *Dicrurus remifer*	นกแซงแซว หางบ่วงเล็ก	R	X		X		U3
551	Hair-crested Drongo *Dicrurus hottentottus*	นกแซงแซวหงอนขน	R	X	X	X	X	X
552	Greater Racket-tailed Drongo *Dicrurus paradiseus*	นกแซงแซว หางบ่วงใหญ่	R	X	X	X	X	X
809	Black-naped Monarch *Hypothymis azurea*	นกจับแมลงจุกดำ	R,N	X	X	X	X	X
813	Asian Paradise-flycatcher *Terpsiphone paradisi*	นกแซวสวรรค์	R,N	X	X	X	X	X
812	**Japanese Paradise-flycatcher** ***Terpsiphone atrocaudata***	**นกแซวสวรรค์หางดำ**	Vagrant		X			
504	Common Iora *Aegithina tiphia*	นกขมิ้นน้อยธรรมดา	R	X	X	X	X	X

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505	Great Iora *Aegithina lafresnayei*	นกขมิ้นน้อยปีกสีเรียบ	R	X	X	X	X	X
488	Large Woodshrike *Tephrodornis gularis*	นกเฉี่ยวดงหางสีน้ำตาล	R	X	X	X	X	X
489	Common Woodshrike *Tephrodornis pondicerianus*	นกเฉี่ยวดงธรรมดา	R		5	X		
749	White-throated Rock Thrush Monticola gularis	นกกระเบื้องคอขาว	N	X	X	X	X	3
751	Blue Rock Thrush *Monticola solitarius*	นกกระเบื้องผา	N	X	X	X	X	X
752	Blue Whistling Thrush *Myophonus caeruleus*	นกเอี้ยงถ้ำ	R,N	X		X	X	
754	Orange-headed Thrush *Zoothera citrina*	นกเดินดงหัวสีส้ม	N	X	X	X	X	
755	Siberian Thrush *Zoothera sibirica*	นกเดินดงสีเทาดำ	P	X		1		
757	Scaly Thrush *Zoothera dauma*	นกเดินดงลายเสือ	N	X				
	Japanese Thrush *Turdus cardis*	นกเดินดงญี่ปุ่น	Vagrant	X	X			
764	Eyebrowed Thrush *Turdus obscurus*	นกเดินดงสีคล้ำ	N	X	X	X		
766	Dusky Thrush *Turdus naumanni*	นกเดินดงอกลาย	Vagrant	X				
770	Dark-sided Flycatcher *Muscicapa sibirica*	นกจับแมลงสีคล้ำ	N	X		X	X	X

« previous description next »

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
772	Asian Brown Flycatcher *Muscicapa dauurica*	นกจับแมลงสีน้ำตาล	N	X	X	X	X	3
771	Ferruginous Flycatcher *Muscicapa ferruginea*	นกจับแมลง สีน้ำตาลแดง	P	X	X			
778	Yellow-rumped Flycatcher *Ficedula zanthopygia*	นกจับแมลง ตะโพกเหลือง	P	X	X	1	X	
779	**Green-backed Flycatcher** ***Ficedula elisae***	**นกจับแมลง** **หลังสีเขียว**	P	X				
777	Mugimaki Flycatcher *Ficedula mugimaki*	นกจับแมลงดำอกสีส้ม	N	X	X			
785	Slaty-backed Flycatcher *Ficedula hodgsonii*	นกจับแมลงหลังสีเทา	N	X				
775	Red-throated Flycatcher *Ficedula parva*	นกจับแมลงคอแดง	N	X	X	X	X	3
791	Blue-and-white Flycatcher *Cyanoptila cyanomelana*	นกจับแมลง สีฟ้าท้องขาว	Vagrant	X			X	
797	Verditer Flycatcher *Eumyias thalassina*	นกจับแมลงสีฟ้า	N	X	X	X	X	3
796	Vivid Niltava *Niltava vivida*	นกนิลตวาท้องสีส้ม	N	X				
800	Hainan Blue Flycatcher *Cyornis hainanus*	นกจับแมลงอกสีฟ้า	R	X	X	X		X
801	Chinese Blue Flycatcher *Cyornis glaucicomans*	นกจับแมลงพันธุ์จีน	Vagrant	X				
802	Hill Blue Flycatcher *Cyornis banyumas*	นกจับแมลง คอน้ำตาลแดง	R	X		X		

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
803	Tickell's Blue Flycatcher *Cyornis tickelliae*	นกจับแมลงอกส้มท้องขาว	R	X	X	2	X	
790	Grey-headed Flycatcher *Culicicapa ceylonensis*	นกจับแมลงหัวเทา	N	X	X	X	X	3
721	Rufous-tailed Robin *Luscinia sibilans*	นกเขนน้อยหางแดง	N	X			X	
722	Siberian Rubythroat *Luscinia calliope*	นกคอทับทิม	N	X	5	X		
724	Bluethroat *Luscinia svecica*	นกคอมรกต	Vagrant	X				
726	Siberian Blue Robin *Luscinia cyane*	นกเขนน้อยไซบีเรีย	N	X	X	X	X	X
727	Orange-flanked Bush Robin *Tarsiger cyanurus*		Vagrant	X				
729	Oriental Magpie Robin *Copsychus saularis*	นกกางเขนบ้าน	R	X	X	X	X	X
730	White-rumped Shama *Copsychus malabaricus*	นกกางเขนดง	R	X	X	X	X	X
741	Slaty-backed Forktail *Enicurus schistaceus*	นกกางเขนน้ำหลังเทา	R	X				
742	White-crowned Forktail *Enicurus leschenaulti*	นกกางเขนน้ำหัวขาว	R	X				
745	Common Stonechat *Saxicola torquata*	นกยอดหญ้าหัวดำ	N	X	X	1	X	3
746	Pied Bushchat *Saxicola caprata*	นกยอดหญ้าสีดำ, นกขี้หมา	R	X	5	X	X	X

« previous description next »

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
748	Grey Bushchat *Saxicola ferrea*	นกยอดหญ้าสีเทา	Vagrant	X				
835	**Golden-crested Myna** ***Ampeliceps coronatus***	**นกเอี้ยงหัวสีทอง**	R	X	X	X	X	X
836	**Hill Myna** ***Gracula religiosa***	**นกขุนทอง**	R	X	X	X	X	X
834	White-vented Myna *Acridotheres grandis*	นกเอี้ยงหงอน	R	X	X	X	X	X
832	Common Myna *Acridotheres tristis*	นกเอี้ยงสาริกา	R	X		X	X	X
831	Vinous-breasted Myna *Acridotheres burmannicus*	นกกิ้งโครงหัวสีนวล	R			X	X	X
830	Black-collared Myna *Gracupica nigricollis*	นกกิ้งโครงคอดำ	R	X	X	X	X	X
829	Asian Pied Myna *Gracupica contra*	นกเอี้ยงด่าง	R				X	
826	Purple-backed Starling *Sturnia sturnina*	นกกิ้งโครงแกลบ หลังม่วงดำ	Vagrant	X				
825	White-shouldered Starling *Sturnia sinensis*	นกกิ้งโครงแกลบ ปีกขาว	Vagrant	X		1		
823	Chestnut-tailed Starling *Sturnia malabarica*	นกกิ้งโครงแกลบ หัวเทา	N/R?	X		1		
578	Chestnut-bellied Nuthatch *Sitta castanea*	นกไต่ไม้ ท้องสีเม็ดมะขาม	R		5	X		
579	Velvet fronted Nuthatch *Sitta frontalis*	นกไต่ไม้ หน้าผากกำมะหยี่	R	X	X	X	X	X

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
574	Great Tit *Parus major*	นกติ๊ดใหญ่	R			X		
576	Sultan Tit *Melanochlora sultanea*	นกติ๊ดสุลต่าน	R	X	X	X		X
464	Sand Martin *Riparia riparia*	นกนางแอ่นทราย สร้อยคอดำ	N	X				
465	Dusky Crag Martin *Hirundo concolor*	นกนางแอ่นผาสีคล้ำ	R	X				
466	Barn Swallow *Hirundo rustica*	นกนางแอ่นบ้าน	N	X	X	X	X	X
469	Red-rumped Swallow *Hirundo daurica*	นกนางแอ่นตะโพกแดง	N	X	X	X	X	
469	[Striated Swallow *Hirundo striolata]*	นกนางแอ่นลาย		U				U3
471	Asian House Martin *Delichon dasypus*	นกนางแอ่นมาติน พันธุ์เอเซียใต้	N	X	X	X		
514	Black-headed Bulbul *Pycnonotus atriceps*	นกปรอดทอง	R	X	X	X	X	X
515	Black-crested Bulbul *Pycnonotus melanicterus*	นกปรอดเหลืองหัวจุก	R	X	X	X	X	X
519	Red-whiskered Bulbul *Pycnonotus jocosus*	นกปรอดหัวโขน	R	X	X	1	X	
521	Sooty-headed Bulbul *Pycnonotus aurigaster*	นกปรอดหัวสีเขม่า	R	Mc	X	X	X	X
523	Stripe-throated Bulbul *Pycnonotus finlaysoni*	นกปรอดคอลาย	R	X	X	X	X	X

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
525	Yellow-vented Bulbul *Pycnonotus goiavier*	นกปรอดหน้านวล	R	X		1	X	
527	Streak-eared Bulbul *Pycnonotus blanfordi*	นกปรอดสวน	R	X	X	X		X
532	Puff-throated Bulbul *Alophoixus pallidus*	นกปรอดโอ่ง เมืองเหนือ	R	X	X	X	X	X
539	Grey-eyed Bulbul *Iole propinqua*	นกปรอดเล็กตาขาว	R	X	X	X	X	X
543	Ashy Bulbul *Hemixos flavala*	นกปรอดสีขี้เถ้า	R	X		1		
544	Black Bulbul *Hypsipetes leucocephalus*	นกปรอดดำ	N	X				
693	Zitting Cisticola *Cisticola juncidis*	นกยอดข้าว หางแพนลาย	R			1		3
694	Bright-capped Cisticola *Cisticola exilis*	นกยอดข้าว หางแพนหัวแดง	R	X		1	X	
699	Brown Prinia *Prinia polychroa*	นกกระจิบหญ้า สีน้ำตาล	R		X	X		X
696	Rufescent Prinia *Prinia rufescens*	นกกระจิบหญ้า สีข้างแดง	R	X	X	X	X	X
695	Grey-breasted Prinia *Prinia hodgsonii*	นกกระจิบหญ้า อกเทา	R	X	X	X	X	X
697	Yellow-bellied Prinia *Prinia flaviventris*	นกกระจิบหญ้า ท้องเหลือง	R	X	X	1	X	
698	Plain Prinia *Prinia inornata*	นกกระจิบหญ้า สีเรียบ	R	X	X	X	X	X

« previous description next »

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
869	Chestnut-flanked White-eye *Zosterops erythropleurus*	นกแว่นตาขาว ข้างแดง	N	X		X		
871	Oriental White-eye *Zosterops palpebrosus*	นกแว่นตาขาว สีทอง	R	X		2	X	
870	Japanese White-eye *Zosterops japonicus*	นกแว่นตาขาว หลังเขียว	N	X				
872	[Everett's White-eye *Zosterops everetti]*		R	U				
709	Asian Stubtail *Urosphena squameiceps*	นกกระจ้อยหัวลาย	N	X		X		
714	Baikal Bush Warbler *Bradypterus davidi*	นกกระจ้อยอกเทา	N	X		X		
690	Lanceolated Warbler *Locustella lanceolata*	นกพงตั๊กแตนอกลาย	N	X		X		
686	Black-browed Reed Warbler *Acrocephalus bistrigiceps*	นกพงคิ้วดำ	N	X	X			
688	Blunt-winged Warbler *Acrocephalus concinens*	นกพงนาพันธุ์จีน	N	X	X			
685	Oriental Reed Warbler *Acrocephalus orientalis*	นกพงใหญ่พันธุ์ญี่ปุ่น	N	X	X	1		3
683	Thick-billed Warbler *Acrocephalus aedon*	นกพงปากหนา	N	X	X	X	X	
701	Common Tailorbird *Orthotomus sutorius*	นกกระจิบธรรมดา	R	X	X	X		X
702	Dark-necked Tailorbird *Orthotomus atrogularis*	นกกระจิบคอดำ	R	X	X	X	X	X

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
667	Dusky Warbler *Phylloscopus fuscatus*	นกกระจิ๊ดสีคล้ำ	N	X	X	X	X	3
666	Buff-throated Warbler *Phylloscopus subaffinis*	นกกระจิ๊ด ท้องสีน้ำตาล	N	X				
668	[Yellow-streaked Warbler *Phylloscopus armandii]*	นกกระจิ๊ด อกลายเหลือง	N	U				
669	Radde's Warbler *Phylloscopus schwarzi*	นกกระจิ๊ดปากหนา	N	X	X	X	X	
680	Chinese Leaf Warbler *Phylloscopus sichuanensis*	นกกระจิ๊ดพันธุ์จีน	N	X				
679	Yellow-browed Warbler *Phylloscopus inornatus*	นกกระจิ๊ดธรรมดา	N	X	X	X	X	3
671	Arctic Warbler *Phylloscopus borealis*	นกกระจิ๊ดขั้วโลกเหนือ	N	X	X			X
672	[Greenish Warbler *Phylloscopus trochiloides]*	นกกระจิ๊ดเขียวคล้ำ	N	U				
673	Two-barred Warbler *Phylloscopus plumbeitarsus*	นกกระจิ๊ดเขียว ปีกสองแถบ	N	X	X	X	X	X
670	Pale-legged Leaf Warbler *Phylloscopus tenellipes*	นกกระจิ๊ดขาสีเนื้อ	N	X	X	X	X	
674	Eastern Crowned Warbler *Phylloscopus coronatus*	นกกระจิ๊ดหัวมงกุฎ	N	X	X	X	X	
675	Blyth's Leaf Warbler *Phylloscopus reguloides*	นกกระจิ๊ดหางขาวใหญ่	N	X		X		
676	White-tailed Leaf-Warbler *Phylloscopus davisoni*	นกกระจิ๊ดหางขาวเล็ก	R	X				

« previous description next »

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
678	Sulphur-breasted Warbler *Phylloscopus ricketti*	นกกระจิ๊ดคิ้วดำท้องเหลือง	N	X				
661	Omei Spectacled Warbler *Seicercus omeiensis* *	นกกระจ้อยวงตาสีทอง	N	X		X		
661	Plain-tailed Warbler *Seicercus soror*	นกกระจ้อยวงตาสีทอง	N	X		X	(X)	X
664	Yellow-bellied Warbler *Abroscopus superciliaris*	นกกระจ้อยคอขาว	R	X		1		
621	White-crested Laughingthrush *Garrulax leucolophus*	นกกะรางหัวหงอก	R	X	X	X	X	X
622	Lesser Necklaced Laughingthrush *Garrulax monileger*	นกกะรางสร้อยคอเล็ก	R	X	X	1	X	X
625	Black-throated Laughingthrush *Garrulax chinensis*	นกกะรางคอดำ, นกซอฮู้	R	X	X	1	X	
591	Abbott's Babbler *Malacocincla abbotti*	นกกินแมลงป่าฝน	R	X	X	X	X	X
583	Puff-throated Babbler *Pellorneum ruficeps*	นกจาบดินอกลาย	R	X	X	X	X	X
594	Scaly-crowned Babbler *Malacopteron cinereum*	นกกินแมลงหัวแดงเล็ก	R	X	X	X	X	X
596	Large Scimitar Babbler *Pomatorhinus hypoleucos*	นกระวังไพรปากยาว	R	X	X	X		X
598	White-browed Scimitar Babbler *Pomatorhinus schisticeps*	นกระวังไพรปากเหลือง	R	X	X	X		X
603	**Limestone Wren Babbler *Napothera crispifrons***	**นกจู๋เต้นเขาปูน**	R	X				

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
617	Striped Tit Babbler *Macronous gularis*	นกกินแมลงอกเหลือง	R	X	X	X	X	X
619	Chestnut-capped Babbler *Timalia pileata*	นกกินแมลงกระหม่อมแดง	R	X	X	X	X	X
620	Yellow-eyed Babbler *Chrysomma sinense*	นกกินแมลงตาเหลือง	R	X	X	1		X
643	White-browed Shrike Babbler *Pteruthius flaviscapis*	นกเสือแมลงปีกแดง	R	X				
641	Chestnut-fronted Shrike Babbler *Pteruthius aenobarbus*	นกเสือแมลงหน้าสีตาล	R	X				
640	White-bellied Yuhina *Yuhina zantholeuca*	นกภูหงอนท้องขาว	R	X	X	X	X	X
474	Indochinese Bushlark *Mirafra erythrocephala*	นกจาบฝนปีกแดง	R		X	2	X	X
862	Thick-billed Flowerpecker *Dicaeum agile*	นกกาฝากปากหนา	R	X	X	X	X	X
863	Yellow-vented Flowerpecke *Dicaeum chrysorrheum*	นกกาฝากก้นเหลือง	R	X	X	1	X	
866	Plain Flowerpecker *Dicaeum concolor*	นกกาฝากสีเรียบ	R	X	X			3
868	Buff-bellied Flowerpecker *Dicaeum i. cambodianum*	นกกาฝากอกสีเนื้อ	R	X				
867	Scarlet-backed Flowerpecker *Dicaeum cruentatum*	นกสีชมพูสวน	R	X	X	X	X	X
838	Brown-throated Sunbird *Anthreptes malacensis*	นกกินปลีคอสีน้ำตาล	R				X	

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
840	Ruby-cheeked Sunbird *Anthreptes singalensis*	นกกินปลีแก้มสีทับทิม	R	X	X	X	X	X
842	Purple-throated Sunbird *Nectarinia sperata*	นกกินปลีคอสีม่วง	R	X	X	1	X	
844	Olive-backed Sunbird *Nectarinia jugularis*	นกกินปลีอกเหลือง	R	X	X	X	X	X
845	Purple Sunbird *Nectarinia asiatica*	นกกินปลีดำม่วง	R	Mc	X	X	4	
848	Black-throated Sunbird *Aethopyga saturata*	นกกินปลีหางยาว คอดำ	R	X				
849	Crimson Sunbird *Aethopyga siparaja*	นกกินปลีคอแดง	R	X	X	X	X	X
852	Little Spiderhunter *Arachnothera longirostra*	นกปลีกล้วยเล็ก	R	X	X	X	X	3
874	Plain-backed Sparrow *Passer flaveolus*	นกกระจอกตาล	R	X	X	X	X	X
873	Eurasian Tree Sparrow *Passer montanus*	นกกระจอกบ้าน	R	X	X	X	X	X
484	Forest Wagtail *Dendronanthus indicus*	นกเด้าลมดง	N	X	X	1	X	X
480	White Wagtail *Motacilla alba*	นกอุ้มบาตร	N	X		X	X	3
482	Yellow Wagtail *Motacilla flava*	นกเด้าลมเหลือง	N	X		2	X	
481	Grey Wagtail *Motacilla cinerea*	นกเด้าลมหลังเทา	N	X	X	X	X	X

« previous description next »

L&R	Species	Thai name	Status	Khao Yai	Sakaerat	Thap Lan	Pang Sida	Ta Phraya
477	Richard's Pipit *Anthus richardi*	นกเด้าดินทุ่งใหญ่	Vagrant	X				
477	Paddyfield Pipit *Anthus rufulus*	นกเด้าดินทุ่งเล็ก	R	X	X	X	X	X
	Blyth's Pipit *Anthus godlewskii*	นกเด้าดินนิ้วสั้น	Vagrant	X				
476	Olive-backed Pipit *Anthus hodgsoni*	นกเด้าดินสวน	N	X	X	X	X	3
478	Red-throated Pipit *Anthus cervinus*	นกเด้าดินอกแดง	Vagrant	X				
877	**Baya Weaver** ***Ploceus philippinus***	**นกกระจาบธรรมดา**	R			2	X	
881	Pin-tailed Parrotfinch *Erythrura prasina*	นกกระติ๊ดเขียว, นกไผ่	R	X		1		
883	White-rumped Munia *Lonchura striata*	นกกระติ๊ดตะโพกขาว	R	X	X	X	X	X
885	Scaly-breasted Munia *Lonchura punctulata*	นกกระติ๊ดขี้หมู	R	X	X	X	X	X
890	Common Rosefinch *Carpodacus erythrinus*	นกจาบปีกอ่อน สีกุหลาบ	Vagrant	X				
893	Yellow-billed Grosbeak *Eophona migratoria*	นกกระติ๊ดใหญ่ ปากเหลือง	Vagrant	X				
899	**Yellow-breasted Bunting** ***Emberiza aureola***	**นกจาบปีกอ่อน อกเหลือง**	Vagrant	X				
901	Chestnut Bunting *Emberiza rutila*	นกจาบปีกอ่อนสีตาล	Vagrant	X			X	

« previous description

APPENDIX 2. Additional species thought probably to occur in Dong Phayayen - Khao Yai for which evidence is as yet lacking or inconclusive.

Bamboo Woodpecker *Gecinulus viridis*

Khao Yai A sight record from the headquarters area of Khao Yai on 16 January 1983 is rejected because the area lacks stands of large-culm bamboo favoured by this species, and because of the absence of any other records in spite of high coverage. This sighting can almost certainly therefore be attributed to a mistaken identification.

Bamboo Woodpecker might be expected to be present in lowlands of DPKY, in areas dominated by bamboo. A specimen in the Chulalongkorn University Zoological Museum collection collected by C.J. Aagaard, was taken at Pak Chong on 30 June 1930.

Alexandrine Parakeet *Psittacula eupatria*

Sakaerat Listed by TISTR (2000), though no supporting details are given. Considered to be nationally endangered by Round (2000), this inhabitant of lowland deciduous woodland might once have been expected to occur in lowlands of DPKY but is likely to be now extirpated, or at best present in very small numbers.

Yellow-footed Pigeon *Treron phoenicoptera*

Khao Yai McClure and Leelavit (1972) listed two birds as banded in Khao Yai 1967. However, this record was omitted by McClure (1974) and the record is regarded as unreliable in the present treatment. Also listed for Khao Yai by Flotow (1980) and by P. Bristow for 26 May 1984. No details were provided.
The core habitat of this species is deciduous lowland forest mosaic, and its presence around Khao Yai headquarters would be unlikely. It formerly occurred on the eastern plateau (Deignan, 1963), and would once have been present around the lowland margins of DPKY.

Chinese Sparrowhawk *Accipiter soloensis*

Khao Yai A provisional sighting from the south end of the Khao Khieo ridge on 9 February 1963 (Dickinson, 1963) may be best treated as unconfirmed since the midwinter date does not accord with what is known elsewhere of this species in Thailand. It seems to be chiefly or entirely a scarce spring and autumn passage migrant. One was also claimed for the HQ area on 3 December 1999 (Yoav Perlman, *in litt.*) but no details were provided.

Eurasian Sparrowhawk *Accipiter nisus*

Khao Yai	One, 13 December 1988 (J and J. Geeson, *in litt.*; two, 16 January 1990 (Grahame Hopwood, Jim Vaughan: *Bangkok Bird Club Bulletin 7*, no. 3, March 1990).
Pang Sida	One claimed, 11 December 1993 (Krisanapol Wichapant and Somyot Ngowattana, *in litt.*

Accipiter hawks are notoriously difficult to identify and, in the absence of adequate documentation, none of these records are acceptable. Nonetheless, *A. nisus* is an annual winter visitor to the north; has reliably been reported for the Bangkok area (Deignan, 1963); while occurrences south as far as peninsular Malaysia have been suspected, but remain unsubstantiated. The occurrence of Eurasian Sparrowhawk in DPKY in winter, therefore, is certainly possible.

Black-and-red Broadbill *Cymbirhynchus macrorhynchos*

There are no records of this species from within DPKY. However, during the early decades of the twentieth century it was collected in the lowlands around Pak Chong and elsewhere in the Mun River drainage (Kloss, 1918; Baker, 1919), and from Sa Kaeo (Riley, 1938). It is fairly widespread in Indochina, occurring in seasonally dry areas (though almost always in evergreen, including dry evergreen and secondary growth), and is usually associated with the banks of streams and rivers. It is possible that it is present in eastern DPKY, since both possess apparently suitable habitat. Because of its restriction to lowland areas, it is considered nationally vulnerable (Round, 2000).

Striated Swallow *Hirundo striolata*

Ta Phraya	Listed by J. Nabhitabhata (*in litt.*). However, the same observer did not record Red-rumped Swallow *H. daurica* which is a common winter visitor, and more likely to be present than *H. striolata*, this record is at present treated as unconfirmed.

Resident *H. striolata stanfordi* have been recorded nesting further east, at Khao Phra Viharn on the Cambodian border adjacent to Srisaket Province (author, unpubl. obs.), while *H. striolata mayri* may possibly be expected as a non-breeding visitor, but is extremely difficult to separate from *H. daurica*. At the present time, there are no confirmed records of *H. striolata* from DPKY.

Everett's White-eye *Zosterops everetti*

Khao Yai	Listed for the park by E.C. Dickinson (*in litt.* to PDR, November 1985) on the basis of his sight record. A further sight record from Kong Kaeo, near the park headquarters, on 25 September 2002 (Ms. Sopitcha Tantitadapitak, *in litt.*)

Both records are plausible as this mainly Sundaic species extends up the peninsula north to Kaeng Krachan, and apparently also occurs in Khao Soi Dao, SE Thailand. However, as a montane/upper sub-montane species, it might have been expected to occur on Khao Khieo where one were observed during this survey. It is not known to what extent *Z. everetti* is dispersive or migratory so these records are best regarded as unconfirmed.

Yellow-streaked Warbler *Phylloscopus armandii*

A skin labelled Pak Jong (*sic*) and collected by C.J. Aagaard on 8 February 1925 is in the collection of the Zoological Museum, Copenhagen. There is one sight record within the park on 24 February 1991, but the bird was not heard to call and the record best treated as unconfirmed in view of this species' extreme similarity to the commonly wintering Radde's Warbler *Phylloscopus schwarzi*.

Greenish Warbler *Phylloscopus trochiloides*

Khao Yai	A few birds thought to be this species have been claimed from Khao Yai during the winter months by several observers, though separation from the extremely similar Two-barred Warbler *P. plumbeitarsus*, which is common in the park, is extremely problematical since the two have identical calls and are extremely similar on plumage.
Thap Lan	The listing in the Thap Lan Master Plan is assumed to relate to *Phylloscopus plumbeitarsus*, which is often considered conspecific with *P. trochiloides*.

Nominate *P. t. trochiloides* is listed for Nakhon Ratchasima Province by Deignan (1963) and therefore is likely to occur in Khao Yai and perhaps elsewhere in DPKY.

APPENDIX 3. Species previously reported for Dong Phayayen - Khao Yai thought to be based on erroneous or unsubstantiated records, released captives, or which are otherwise considered unacceptable.

Bar-backed Partridge *Arborophila brunneopectus*

Khao Yai Sight records claimed in December 1981 and 21–24 March 1983. However, the distinctive call of this species has never been heard in Khao Yai or elsewhere in DPKY. If the species was present it would be expected only at higher elevations, but no *Arborophila* were heard on the summit of Khao Rom during the current survey.

Chestnut-headed Partridge *Arborophila cambodiana*

Khao Yai Two reported 5 February 1989. Details were insufficient to establish identity as the birds were poorly seen, although they were said to be "boldly marked with big white spots on black flank feathers". However, the same observers failed to record *A. chloropus* in the park, immediately suggesting that the observation was probably a misidentification of the latter species.

Kalij Pheasant *Lophura leucomelana*

Khao Yai Listed by McClure (1974). Troy Hansel (*in litt.*) reported seeing a pair and later, a lone, tame female on 20 February 1992 near the park headquarters which were clearly released captives

Populations of *Lophura* pheasants treated as races of Kalij Pheasant are found in drier evergreen habitats in the west of the country from Mae Hongson to northernTak (*L.l. lineata*) and from southern Tak south as far as Prachuap Khirikhan (*L.l. crawfurdii*; Deignan, 1963). Although McGowan and Panchen (1994) considered that these taxa were best treated as races of Silver Pheasant, they are provisionally retained as Kalij Pheasant in Round (2000) because of apparent ecological differences from Silver. Regardless of the taxonomic status of *lineata* and *crawfurdii*, neither occurs in Khao Yai, and thus the listing by McClure is certainly erroneous.

Grey Peacock Pheasant *Polyplectron bicalcaratum*

Khao Yai A pair was reported on the abandoned golf-course during 1999; a male was seen in the forest near the headquarters, 2 December 1999 (Yoav Perlman, *in litt.*) and another at a second site, a few km distant, on 23 February 2000 (Mark Read, *in litt.*). These are almost certainly released captives. Had there been a genuinely wild population in Khao Yai, it would long ago have been detected on call. The species extends down the Dong Phaya Fai range south at least as far as Phu Khieo Wildlife Sanctuary (Chaiyaphum Province) but cannot be considered to occur in DPKY.

Red-crowned Barbet *Megalaima rafflesii*

Khao Yai Listed by Flotow (1980) and one or two sight records subsequently claimed. These records are rejected since this species is entirely restricted to lowland rainforest of the Sundaic subregion, occurring north only to c. 11.20' N in Tenasserim (Riley, 1938). Most likely, the sightings refer to Blue-eared Barbet, the field characters of which are shown inadequately in the older field guides.

Blue-throated Barbet *Megalaima asiatica*

Khao Yai Originally listed by Dickinson (1963) but records subsequently withdrawn (Dickinson, 1967). In spite of this, it was subsequently listed by Flotow (1980) and occasional sight records have been since received. All records are rejected owing to probable confusion with Moustached Barbet *M. incognita*.

Sakaerat Listed in error by Ngampongsai and Lauhachinda (1988).

Cinnamon-rumped Trogon *Harpactes orrhophaeus*

Khao Yai One 23 November 1987. An earlier record was also received c. March or April 1979. These records are rejected on the grounds of improbability. This species is a Sundaland lowland forest endemic.

Pink-necked Pigeon *Treron vernans*

Khao Yai Six were claimed for the area between the headquarters and the northern viewpoint, 21 January 1983. However, the observer concerned was then inexperienced and there have been no further records from NE Thailand, so the record is rejected.

Northern Goshawk *Accipiter gentilis*

Khao Yai Sight records for near the park headquarters on 27 January 1986 and from the Khao Luuk Chang Bat Cave, 14 December 1988, are regarded as unconfirmed. Unlike Eurasian Sparrowhawk, this species has never been found anywhere in SE Asia away from the extreme north of the region.

Tawny Eagle *Aquila rapax*

Sakaerat Listed by Ngamongsai and Lauhachinda (1988). This record is unsubstantiated.

Bonelli's Eagle *Hieraaetus fasciatus*

Khao Yai A single bird was claimed for January 1982. No details were supplied, so the record is unacceptable.

Greater Green Leafbird *Chloropsis sonnerati*

Sakaerat This Sundaic species is listed in error by Ngampongsai and Lauhachinda (1988). It is not known to occur anywhere other than in SW and peninsular Thailand, south of approximately 13˚ N.

Long-tailed Minivet *Pericrocotus ethologus*

Khao Yai Listed (sight record), 19 December 1981. No details were given and record is unacceptable. Nonetheless, residents in the mountains of the north are augmented by winter visitors which disperse down to the plains, and the species could be a potential vagrant to DPKY

Long-tailed Thrush *Zoothera dixoni*

Khao Yai Listed by McClure (1974) as vagrant without further comment. All other records are from the far north-west of the country, where Long-tailed Thrush is a scarce winter visitor. This record is therefore discounted.

Dark-sided Thrush *Zoothera marginata*

Khao Yai Listed for the headquarters area by M. Chapman (*in litt.*, 1979). There are no subsequent sightings and the record is unacceptable.

Rufous-chested Flycatcher *Ficedula dumetoria*

Khao Yai Unaccountably and erroneously listed by McClure (1974) for the month of January.

Sakaerat Erroneously listed by Ngampongsai and Lauhachinda (1988) for the month of January.

This species is restricted to the peninsula, south of the Isthmus of Kra. The above records may possibly be accounted for by confusion with the somewhat similarly marked Mugimaki Flycatcher *F. mugimaki*.

Little Pied Flycatcher *Ficedula westermanni*

Khao Yai Listed by Dickinson (1967), though no details supplied, and in McClure (1974). This rather conspicuous montane species was not found during the current survey even though four nights were spent camped near the summit of Khao Rom, the highest point in the park, where it could reasonably be expected to occur. The species is therefore not listed for any site in DPKY.

Rufous-bellied Niltava *Niltava sundara*

Khao Yai A sight record of a female niltava originally identified as *Niltava vivida* (Dickinson and Tubb, 1964) was later considered to have been more probably *Niltava sundara* in Dickinson and Tubb (1966). However, few details were provided and the possibility of the closely similar, and perhaps more likely Fujian Niltava *N. davidi*, females of which may be inseparable from *N. sundara* in the field, was not considered. This record is therefore better omitted. On present evidence the only niltava so far recorded from DPKY is *N. vivida*.

Pale Blue Flycatcher *Cyornis unicolor*

Khao Yai	Listed by Dickinson (1967), by Flotow (1980) and, presumably on the strength of these reports, in the Khao Yai Management Plan 1987–1991 as among the scarcer bird species found in the park. There have been no further reports and these records are best omitted. If the species was present, its distinctive song would probably have been heard.
Thap Lan	Listed for the park by Mr. Pornchai Visutatharn (*in litt.*). The record should be regarded as provisional in the absence of confirmed records from neighbouring sites.

Asian Glossy Starling *Aplonis panayensis*

Khao Yai	Erroneously listed by McClure (1974). This species is known only from the peninsula, from Prachuap Khiri Khan (ca. 12 deg N latttude) southwards.

Common House Martin *Delichon urbica*

Khao Yai	Listed by McClure (1974), though previous identifications are thought unreliable. Only Asian House Martin. *D. dasypus* is currently considered to occur in DPKY.

White-throated Bulbul *Alophoixus flaveolus*

Khao Yai	Listed on occasion by na_ve observers, in confusion with brighter examples of Puff-throated Bulbul *A. pallidus*. This species is certainly absent from DPKY, and restricted to the western margin of the country.

Ochraceous Bulbul *Alophoixus ochraceus*

KhaoYai	Listed by a few observers, in confusion with Puff-throated Bulbul. As first pointed out by Dickinson (1967) and Dickinson and Chaiyaphum (1968) the specimens of *Alophoixus* bulbuls from Khao Yai have all proved to be *A. pallidus*.
Thap Lan	Listed in RFD Master Plan, probably in error.
Ta Phraya	Listed by J. Nabhitabhata (*in litt.*), presumably in error.

There is an outlying population of this Sundaic species in Khao Soi Dao, SE Thailand, and it is also known from SW Cambodia, S. Annam and Cochinchina, but has never been recorded anywhere in Thailand on the eastern plateau.

Hill Prinia *Prinia atrogularis*

Sakaerat	Listed in error by Ngampongsai and Lauhachinda (1988).

Mountain Tailorbird *Orthotomus cuculatus*

Khao Yai	A report in April 1981 is rejected. There have been no subsequent records.

Lemon rumped Warbler *Phylloscopus proregulus*

Khao Yai Listed by CDC (1989). See under Chinese Leaf Warbler in the text for a clarification of past records.

Hume's Leaf Warbler *Phylloscopus humei*

Khao Yai Two reported, 8 March 2001. The observer was familiar with this species from Europe, where it is a scarce vagrant. However the only description supplied, "small grey warblers calling like Hume's" was considered insufficient to establish identity beyond doubt. If Hume's Warbler were to occur in DPKY it would most likely be of the race already recorded in N. Thailand, *P.h. mandelli* which tends to be greener and subtly different on call from *P.h. humei* (the race occurring in Europe and which, as yet, is unrecorded from Thailand.)

Greater Necklaced Laughingthrush *Garrulax pectoralis*

Khao Yai Five claimed from the headquarters area on 2 December 1999 were presumably misidentified Lesser Necklaced Laughingthrush, *G. monileger*. There is no evidence that *G. pectoralis* is present anywhere in Thailand other than in the north and along the western margin.

Spot-throated Babbler *Pellorneum albiventer*

Khao Yai One claimed as banded, 1967 (McClure and Leelavit, 1972) is discounted. This montane species is only known in Thailand from the north-west, and has not even been found in Phu Luang and other montane sites in the Dong Phaya Fai Range north of Khao Yai.

Buff-breasted Babbler *Pellorneum tickelli*

Khao Yai Reported on 6 January 1984.There have been no subsequent site or aural records, and this sighting is therefore rejected.

Eyebrowed Wren Babbler *Napothera epilepidota*

Khao Yai A sight record of J. A. Tubb from the mid-1960s was thought implausible (E.C. Dickinson, *in litt*. to PDR, November 1985). Although this primarily montane species occurs down to foothills in the peninsula, and has been recorded in NE Thailand in the north of the Dong Phaya Fai range, the absence of further records makes its occurrence in Khao Yai or elsewhere in DPKY unlikely.

Brown-cheeked Fulvetta *Alcippe poioicephala*

Khao Yai A sight record, January 1985. However, there are no other sight or aural records for any area in DPKY and the species is therefore not thought to occur.

Rufous-backed Sibia *Heterophasia annectans*

Khao Yai One possible sight record from Khao Laem is rejected as highly unlikely . This montane species is only known in Thailand from the north-west.

Scarlet-breasted Flowerpecker *Prionochilus thoracicus*

Sakaerat Listed in error by Ngampongsai and Lauhachinda (1988).

Purple-naped Sunbird *Hypogramma hypogrammicum*

Khao Yai Listed by McClure (1974) as a possible vagrant to the park, and a more recent sight record was claimed ca. 1986. However, there are no other records for any area in DPKY, or indeed from any other forest area on the eastern plateau (Deignan, 1963) and the record is best treated as unsubstantiated.

Appendix IV. Provisional list of large mammals for the Dong Phayayen - Khao Yai forest complex by protected area unit. Key Species are indicated in bold-face type.

Scientific Name	English Name	Thai Name	IUCN[1] (2004)	OEPP[2] (1996)	Protected area[3]				
					Khao Yai	Sakaerat	Pang Sida	Thap Lan	Ta Phraya
Manis javanica	**Sunda Pangolin**	ลิ่นซุนดา	LR/NT				4	5	
Tupaia belangeri	Northern Treeshrew	กระแตธรรมดา				1c	3	4	5
Dendrogale murina	Northern Smooth-tailed Treeshrew	กระแตหางหนู					4		
Nycticebus coucang	Slow Loris	นางอายหรือลิงลม			1c	3	4	5	
Macaca nemestrina	**Pig-tailed Macaque**	ลิงกัง	VU		1a/b	3	4	1a	1a
Macaca arctoides	**Bear Macaque**	ลิงเสน	VU	VU			4		
Macaca fascicularis	**Long-tailed Macaque**	ลิงแสม	LR/NT				4	5	
Presbytis cristata	**Silvered Langur**	ค่างหงอก					4	5	
Hylobates lar	**White-handed Gibbon**	ชะนีธรรมดา	LR/NT	VU	1b/c	3			
Hylobates pileatus	**Pileated Gibbon**	ชะนีมงกุฎ	VU	EN	1b/c		4	5	
Canis aureus	**Golden Jackal**	หมาจิ้งจอก			1a		4	5	
Cuon alpinus	**Dhole**	หมาใน	EN	VU	1a/c		4	5	1a
Ursus thibetanus	**Asiatic Black Bear**	หมีควายหรือหมีดำ	VU	VU	1a/b/c		4	5	
Helarctos malayanus	**Sunbear**	หมีหมาหรือหมีคน	DD	VU	1a/b/c		4	5	1a
Martes flavigula	Yellow-throated Marten	หมาไม้*			1a/c	3	4	1a	
Arctonyx collaris	Hog-Badger	หมูหริ่ง			1a	3	4	1a	
Melogale sp.	**Ferret-Badger sp.**	หมาไม้*			1a	3	4	5	
Lutrogale perspicillata	**Smooth-coated Otter**	นากใหญ่ขนเรียบ		VU	1c		4	5	

[1] Follows IUCN Global Threat Categories (see p. 20-21).

[2] Follows national threat categories i.e. VU=vulnerable in Thailand; EN=endangered in Thailand; CR=critically endangered in Thailand.

[3] Sources of information; 1a Direct survey - camera-trapping, 1b Direct survey - line-transect observation, 1c Direct observation - other field observation, 2 Srikosamatara and Hansell 1996, 3 TISTR 2001, 4 Mauric 1996, 5 Conservation Data Center, Mahidol University

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Aonyx cinerea	**Oriental Small-clawed Otter**	**นากเล็กเล็บสั้น**			1c		4	5	
Viverricula malaccensis	Small Indian Civet	ชะมดเช็ด			1a/c	3	4	5	1a
Viverra zibetha	Large Indian Civet	ชะมดแผงหางปล้อง			1a	3	4	1a	1a
Viverra megaspila	**Large-Spotted Civet**	**ชะมดแผงสันหางดำ**		VU	1a		4	5	1a
Arctogalidia trivirgata	Three-striped Palm Civet	อีเห็นหน้าขาว					4	5	
Paradoxurus hermaphroditus	Common Palm Civet	อีเห็นข้างลาย			1a	3	4	5	1a
Paguma larvata	Masked Palm Civet	อีเห็นเครือ			1a	3	4	5	
Arctictis binturong	**Binturong**	**หมีขอหรือบินตุรง**			1a/c	3	4	5	
Herpestes javanicus	Javan Mongoose	พังพอนธรรมดา			1c	3	4	5	1a
Herpestes urva	Crabeating Mongoose	พังพอนกินปู			1a/c		4	5	
Pardofelis marmorata	**Marbled Cat**	**แมวลายหินอ่อน**	VU	EN	1a				
Prionailurus viverrinus	**Fishing Cat**	**เสือปลา**	VU		1c		4	5	
Prionailurus bengalensis	Leopard Cat	แมวดาว			1a/c	3	4		1a
Felis chaus	**Jungle Cat**	**แมวป่า**		CR		3	4	5	
Catopuma temmincki	**Asian Golden Cat**	**เสือไฟ**	VU	EN	1a		4	1a	
Neofelis nebulosa	**Clouded Leopard**	**เสือลายเมฆ**	VU	VU	1a/c		4		1a
Panthera pardus	**Leopard**	**เสือดาวหรือเสือดำ**		VU			4	5	1a
Panthera tigris	**Tiger**	**เสือโคร่ง**	EN	VU	1a		4	1c	
Elephas maximus	**Asian Elephant**	**ช้าง**	EN	EN	1a/c		4	1a	1c
Sus scrofa	Wild Pig	หมูป่า			1a/b	3	4	1a	1a
Tragulus javanicus	Lesser Mouse Deer	กระจงเล็ก			1a/c	3	4	5	1a
Muntiacus muntjak	Red Muntjac	เก้ง			1a/c	3	4	5	
Cervus unicolor	Sambar	กวางป่า			1a/c	3	4	5	
Bos javanicus	**Banteng**	**วัวแดง**	EN	CR		3	4	5	1c
Bos gaurus	**Gaur**	**กระทิง**	VU	VU	1a/c	3	4		1c
Naemorhedus sumatraensis	**Southern Serow**	**เลียงผา**	VU		1a	3	4		1a

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Lepus peguensis	Siamese Hare	กระต่ายป่า			1a/c	3	4	5	1a
Ratufa bicolor	**Black Giant Squirrel**	**พญากระรอกดำ**			1b/c	3	4		1c
Callosciurus finlaysoni	Variable Squirrel	กระรอกหลากสี			1b/c	3	4	5	1c
Callosciurus caniceps	Grey-bellied Squirrel	กระรอกปลายหางดำ			1b	3	4	5	1c
Tamiops rodolphei	Cambodian Striped Tree Squirrel	กระเล็นขนปลายหูยาว					4	5	
Tamiops macclellandi	Western Striped Tree Squirrel.	กระเล็นขนปลายหูสั้น			2	3			
Menetes berdmorei	Indochinese Ground Squirrel.	กระจ้อน			1d	3	4	5	
Dremomys rufigenis	Red-cheeked Squirrel	กระรอกดินแก้มแดง			2				
Petaurista petaurista	Red Giant Flying Squirrel	พญากระรอกบินหูแดง			2		4	5	
Hylopetes phayrei	Phayre's Flying Squirrel	กระรอกบินเล็กแก้มขาว				5			
Hylopetes lepidus	Red-cheeked Flying Squirrel.	กระรอกบินเล็กแก้มสีแดง			2	5			
Hylopetes spadiceus	Grey-cheeked Flying Squirrel	พญากระรอกบินแก้มสีเทา				3			
Petinomys setosus	White-bellied Flying Squirrel	กระรอกบินจิ๋วท้องขาว			2	3			
Belomys pearsoni	Hairy-footed Flying Squirrel	กระรอกบินเท้าขน		VU		3			
Hystrix brachyura	**East Asian Porcupine**	**เม่นใหญ่แผงคอยาว**	VU		1a/c	3	4	1a	1a
Atherurus macrourus	Asiatic Brush-tailed Porcupine	เม่นหางพวง			1a	3	4	5	
	Total = 60 species				46	35	51	44	22

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