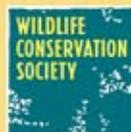




# BIODIVERSITY MONITORING IN THE FLOODPLAIN OF THE TONLE SAP IN 2008-9



# PREFACE

This document presents the results of annual biodiversity monitoring activities in and around the Tonle Sap lake and floodplain for the period August 2008 - June 2009. Compiled by WCS, under contract to the Tonle Sap Conservation Project and MoE, the document draws on work by a consortium of other government agencies, notably the Forestry and Fisheries Administrations, and a number of NGOs. Accurate monitoring of this kind enables conservationists to monitor the success of our programs, detect new threats as they arise and communicate the importance of the Tonle Sap ecosystem to decision-makers. It probably represents one of the most ambitious and technically rigorous programs of its kind for any ecosystem in the region and is a testament to the cooperation and dedication of the participants.

The monitoring described here focuses on populations of rare birds, partly because they form one of the most significant aspects of the biodiversity of the lake and partly because they indicate the health of the Tonle Sap ecosystem more broadly. The scope of monitoring in this unique and biologically rich area has grown over the past ten years, hand in hand with the growth of a series of on-the-ground conservation projects at key sites. There is now monitoring in place for thirteen key species, six of them globally threatened, at seven key conservation areas in the Tonle Sap Biosphere Reserve and across the wider floodplain. Most of the protocols used for the described monitoring work were printed in a reference document in 2007<sup>1</sup>.

A parallel system of monitoring for fish, watersnakes and other aquatic species is conducted by the Fisheries Administration, Ministry of Environment and many other stakeholders, with the results published in a separate series of reports. In future it is hoped that monitoring work may be expanded to include some of the highly threatened mammal and reptile species found in the Tonle Sap ecosystem.

The first report of the four in this volume presents results from the monitoring of the breeding waterbird colonies in the Prek Toal Core Area of the Tonle Sap Biosphere Reserve. These are the largest and in some cases only known colonies in Southeast Asia for the species monitored, and they continue to remain in buoyant good health. Colonies were monitored for the following species: Greater and Lesser Adjutant, Painted and Milky Stork, Asian Openbill, Spot-billed Pelican and Oriental Darter. The number of Grey-headed Fish Eagle nests is also monitored in Prek Toal and results are briefly summarized in this report.

The second report compiles monitoring data on non-breeding waterbirds from the seven key sites: Prek Toal, Boeung Tonle Chhmar and Stueng Sen Core Areas and four Integrated Farming and Biodiversity Areas (IFBAs), as well as incidental records from other sites. The species covered here are: Greater and Lesser Adjutant, Painted, Milky, Black-necked and Woolly-necked Stork, Asian Openbill, White-shouldered and Black-headed Ibis, Spot-billed Pelican and Oriental Darter. Little is yet known about bird movements in response to the Tonle Sap's extreme annual cycle of environmental fluctuations but the monitoring of feeding birds at various sites across the floodplain helps us to better understand fluctuations in numbers and distribution.

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<sup>1</sup> WCS (2007) *Tonle Sap Biodiversity Monitoring Protocols*. Wildlife Conservation Society, Phnom Penh, Cambodia.

The third report covers Bengal Floricans, a Critically Endangered bird for which Cambodia holds the majority of the world population. They live in the highly threatened, seasonally inundated grasslands that were once so extensive in the Tonle Sap ecosystem. Key florican populations are found in the Integrated Farming and Biodiversity Areas, a recently established network of grassland reserves and 2009 was the first year that a complete census of the number of territorial male Bengal Floricans was undertaken in these reserves. Monitoring also takes place in the areas used by this species outside the breeding season, just beyond the limits of the floodplain.

The fourth report describes the regional status of Sarus Cranes. In the late dry season cranes aggregate at a small number of wetlands, and every year since 2001 a network of NGOs and government agencies has made counts at this time of year at all key sites across both Cambodia and Vietnam. In recent years additional counts have been conducted in the early and mid dry season to clarify the complex movements that cranes make as water levels change.

The work presented here would not have been possible without financial support gratefully received from the following donors: the Tonle Sap Conservation Project which is a UNDP/GEF project, the Critical Ecosystems Partnership Fund, the Disney Wildlife Conservation Fund and a private donor who has shown great commitment to enhancing the conservation of wildlife in Cambodia.

**អត្ថបទសង្ខេប**

របាយការណ៍នេះរៀបរាប់ពីលទ្ធផលនៃសកម្មភាពសិក្សាត្រួតពិនិត្យតាមដានជីវចម្រុះនៅក្នុង និងជុំវិញ តំបន់បឹងទន្លេសាប និងវាលទំនាបលិចទឹក ក្នុងកំឡុងពេលពីខែសីហា ឆ្នាំ២០០៨ ដល់ខែមិថុនា ឆ្នាំ២០០៩ ដែល រៀបចំចងក្រង ដោយអង្គការសមាគមអភិរក្សសត្វព្រៃ (WCS) ក្រោមកិច្ចព្រមព្រៀងអនុវត្តគម្រោងជាមួយគម្រោង អភិរក្សបឹងទន្លេសាប (TSCP) និងក្រសួងបរិស្ថាន (MoE) ហើយរបាយការណ៍នេះ នឹងឆ្លុះបញ្ចាំងពីលទ្ធផលការងារ ដែលសហការអនុវត្តជាមួយនឹងស្ថាប័នរាជរដ្ឋាភិបាលផ្សេងទៀត ជាពិសេសគឺរដ្ឋបាលជលផល និងអង្គការក្រៅ រដ្ឋាភិបាលជាដៃគូដទៃទៀត។ ការត្រួតពិនិត្យតាមដានដោយជាក់លាក់នេះ នឹងផ្តល់លទ្ធភាពដល់ក្រុមអភិរក្ស ធ្វើការត្រួតពិនិត្យតាមដានជីវចម្រុះនៅក្នុងតំបន់ ដើម្បីឈានទៅរកភាពជោគជ័យនៃកម្មវិធីអភិរក្ស តាមរយៈ ការទទួលបាននូវព័ត៌មានថ្មីអំពីសកម្មភាពតំបន់កំហែងនានា ដែលជះឥទ្ធិពលដល់សារៈសំខាន់របស់ប្រព័ន្ធអេកូឡូស៊ី បឹងទន្លេសាប និងផ្តល់ព័ត៌មានពីការគំរាមកំហែងទាំងនេះទៅដល់ក្រុមអ្នកគ្រប់គ្រងក្នុងការធ្វើសេចក្តីសម្រេចចិត្ត ប្រកបដោយប្រសិទ្ធភាពខ្ពស់។ គម្រោងនេះនឹងអាចជាគម្រោងអនុវត្តដ៏សំខាន់បំផុតមួយ ដែលមានបច្ចេកទេស គ្រប់គ្រាន់ សំរាប់យកទៅអនុវត្តនៅតាមគម្រោងអភិរក្សប្រព័ន្ធអេកូឡូស៊ីស្រដៀងគ្នានៅថ្នាក់តំបន់ និងត្រូវម្សិលម្រាម ជ្រើសរើសប្រតិបត្តិការចូលរួមពីគម្រោងអភិរក្សផ្សេងទៀត។

លទ្ធផលនៃការត្រួតពិនិត្យតាមដានជីវចម្រុះនេះ ពិពណ៌នាអំពីចំនួននៃប្រភេទសត្វស្លាបមានដោយកម្រ ដែលវត្តមានរបស់ពួកវា នឹងឆ្លុះបញ្ចាំងពីសារៈសំខាន់នៃជីវចម្រុះបឹងទន្លេសាប និងពិទ្ធិភាពទូទៅនៃគុណភាព ប្រព័ន្ធអេកូឡូស៊ីបឹងទន្លេសាប។ ទំហំការងារត្រួតពិនិត្យជាទៀតទាត់នៅក្នុងតំបន់ដែលមានជីវចម្រុះដ៏សំបូរបែប និងពិសេសបំផុតនេះ បានកើនឡើងក្នុងរយៈពេល១០ឆ្នាំកន្លងមក ក្រោមកិច្ចខិតខំអនុវត្តការងារផ្ទាល់នៅតាម គម្រោងតំបន់គោលដៅសំខាន់ៗ។ បច្ចុប្បន្នគម្រោងការងារនេះ បាន និងកំពុងធ្វើការការពារប្រភេទសត្វស្លាបសំខាន់ៗ ចំនួន ១៣ប្រភេទ រួមមាន ០៦ប្រភេទ ស្ថិតនៅក្នុងស្ថានភាពទទួលរងគំរាមកំហែងជិតផុតពូជជាសកល ដែលពួកវា មានវត្តមាននៅក្នុងតំបន់អភិរក្ស ០៧កន្លែង ស្ថិតក្នុងតំបន់បំបិទជីវៈមណ្ឌលបឹងទន្លេសាប និងតំបន់ទំនាបលិចទឹក ដ៏ធំល្វីងល្វើយ។ ចំពោះរបៀបវាយណែនាំអំពីការត្រួតពិនិត្យតាមដាននេះភាគច្រើន ត្រូវបានចងក្រងនៅក្នុងឯកសារ យោងក្នុងឆ្នាំ២០០៧<sup>១</sup> ។

ប្រព័ន្ធត្រួតពិនិត្យតាមដានស្របគ្នានឹងគម្រោងខាងលើផងដែរ ការសិក្សាស្រាវជ្រាវអំពីសត្វពស់ទឹក និង ប្រភេទសត្វរស់នៅក្នុងទឹកដទៃទៀត ត្រូវបានអនុវត្តដោយរដ្ឋបាលជលផល ក្រសួងបរិស្ថាន និងស្ថាប័នពាក់ព័ន្ធជា

<sup>១</sup> WCS (២០០៧) ឯកសារណែនាំអំពីរបៀបនៃការត្រួតពិនិត្យតាមដានជីវចម្រុះបឹងទន្លេសាប -Tonle Sap Biodiversity Monitoring Protocols. Wildlife Conservation Society, Phnom Penh, Cambodia.

ច្រើនទៀត។ ជាលទ្ធផលរបាយការណ៍នៃសកម្មភាពដែលបំពេញឱ្យគ្នាទៅមកនេះ ត្រូវបានបោះពុម្ពផ្សព្វផ្សាយជា បន្តបន្ទាប់។ នៅពេលអនាគត យើងសង្ឃឹមថាការងារនេះ នឹងអាចពង្រីកការសិក្សាបន្តថែមទៀត អំពីពួក ថនិកសត្វ និងសត្វល្អិត ដែលកំពុងតែទទួលរងគ្រោះកំហែងខ្លាំងជាសកល ហើយពួកវាក៏មានវត្តមានក្នុងតំបន់បឹង ទន្លេសាបនេះផងដែរ។

របាយការណ៍លើកដំបូង នៃឯកសារបោះពុម្ព ៤វគ្គ រៀបរាប់អំពីលទ្ធផលនៃការត្រួតពិនិត្យតាមដានការ បន្តពូជរបស់សត្វស្លាបទឹកនៅតាមបន្ទាយពងកូនក្នុងតំបន់ស្នួលព្រែកទាល់ នៃតំបន់បំបិទជីវៈមណ្ឌលបឹងទន្លេសាប។ នេះជាលទ្ធផលនៃការរកឃើញបន្ទាយពងកូនដ៏ធំបំផុត និងមាននៅសល់តិចតួចបំផុត នៅក្នុងតំបន់ភូមិភាគ អាស៊ីអគ្នេយ៍ សំរាប់ប្រភេទសត្វស្លាបទឹកមានដោយកម្រដែលត្រូវបានសិក្សាត្រួតពិនិត្យតាមដាននេះ។ ហើយដែល ទិដ្ឋភាពដ៏សំខាន់បំផុតនេះ នឹងថែរក្សាភាពសុខសាន្តរបស់ប្រភេទសត្វស្លាបទឹកទាំងនេះឱ្យរស់នៅគង់វង្សបន្តទៀត។ ការសិក្សានេះបានត្រួតពិនិត្យតាមដាននៅតាមបន្ទាយពងកូនរបស់ប្រភេទសត្វស្លាបដូចជា ត្រដក់ធំ ត្រដក់តូច រនាលពណ៌ រនាលស ចង្កៀលខ្យង ទុងប្រផេះ និងស្នោញ។ រីឯចំនួនសំបុករបស់អកត្រីក្បាលប្រផេះក៏ត្រូវបានធ្វើ ការត្រួតពិនិត្យតាមដានក្នុងតំបន់ព្រែកទាល់ផងដែរ និងមានលទ្ធផលជាសង្ខេបនៅក្នុងរបាយការណ៍នេះ។

របាយការណ៍លើកទី២ បានប្រមូលចងក្រងទិន្នន័យនៃការត្រួតពិនិត្យតាមដានលើពួកសត្វស្លាបទឹក ដែល មិនបន្តពូជនៅតំបន់ទន្លេសាប ដែលពួកវាមានវត្តមានផងដែរនៅក្នុងតំបន់សំខាន់ៗចំនួន ០៧កន្លែងគឺ តំបន់ស្នួល ព្រែកទាល់ បឹងទន្លេឆ្មារ ស្ទឹងសែន និង៤កន្លែងទៀតក្នុងតំបន់កសិដីវចម្រុះ រួមផ្សំជាមួយការកត់ត្រានៅតាមតំបន់ ផ្សេងទៀតដែលស្ថិតនៅក្បែរតំបន់ទាំងនោះ។ ប្រភេទសត្វស្លាបទឹកដែលរស់នៅក្នុងតំបន់ទាំងនេះរួមមាន ត្រដក់ធំ ត្រដក់តូច រនាលពណ៌ រនាលស អង្កត់ខ្មៅ កុកពាក់អំបោះ(សត្វកស) ចង្កៀលខ្យង ត្រយ៉ងចំកកស ត្រយ៉ងខ្លួនស ទុងប្រផេះ និងស្នោញ។ មានការដឹងតិចតួចនៅឡើងអំពីព័ត៌មាននៃការ បំលាស់ទីរបស់ប្រភេទ សត្វស្លាប ទឹក ទាំងនោះ ក្នុងការ បកស្រាយទាក់ទងទៅនឹងការប្រែប្រួលបរិស្ថាននៃវដ្តប្រចាំឆ្នាំដ៏ធំធេងរបស់បឹងទន្លេសាប ប៉ុន្តែ ការត្រួតពិនិត្យតាមដានពីតំបន់កំណើរបស់សត្វស្លាបទឹកនៅតាមតំបន់នានាទូទាំងតំបន់វាលទំនាបលិចទឹក ជួយ យើងឱ្យដឹងកាន់តែច្បាស់អំពីការប្រែប្រួលនៃចំនួន និងរបាយរបស់សត្វស្លាបទឹកនៅក្នុងតំបន់នេះ។

របាយការណ៍លើកទី៣ រៀបរាប់អំពីសត្វខ្យីបដែលជាប្រភេទសត្វស្លាបទទួលរងគ្រោះជិតផុតពូជខ្លាំងបំផុត ហើយដែលចំនួនរបស់វានៅលើពិភពលោកគឺមានភាគច្រើនក្នុងប្រទេសកម្ពុជា។ ពួកវារស់នៅតាមតំបន់វាលស្មៅ លិចទឹកតាមរដូវ ដែលជាតំបន់លាតសន្ធឹងយ៉ាងធំក្នុងប្រព័ន្ធអេកូឡូស៊ីបឹងទន្លេសាប ហើយដែលតំបន់នេះបាន ទទួលរងការគំរាមកំហែងយ៉ាងខ្លាំង។ ចំនួនប្រមូលផ្តុំរបស់សត្វខ្យីបភាគច្រើន ត្រូវបានគេឃើញមាននៅតាមតំបន់ កសិដីវចម្រុះ ដែលជាតំបន់ថ្មីត្រូវបានបង្កើតឡើងជាបណ្តាញនៃតំបន់ការពារវាលស្មៅ។ នៅឆ្នាំ២០០៩ គឺជាឆ្នាំ ដំបូងដែលការធ្វើជំរឿនពេញលេញមួយ ត្រូវបានគេធ្វើឡើងដើម្បីរាប់ចំនួនទិដ្ឋភាពរបស់សត្វខ្យីបឈ្មោល

ដែលមាននៅក្នុងតំបន់នេះ ។ ការស្រាវជ្រាវត្រួតពិនិត្យតាមដានក៏ត្រូវបានធ្វើឡើងផងដែរ នៅតាមតំបន់ទីជម្រក ផ្សេងទៀតដែលមិនមែនជាតំបន់ពងកូនរបស់ពួកវា ដែលស្ថិតនៅជាយឆ្ងាយពីវាលទំនាបលិចទឹក ។

របាយការណ៍លើកទី៤ រៀបរាប់អំពីស្ថានភាពថ្នាក់តំបន់របស់សត្វក្រៀល ។ នៅចុងរដូវប្រាំង សត្វក្រៀល ប្រមូលផ្តុំនៅតាមតំបន់ដីសើមសំខាន់ៗមួយចំនួន ដែលជារៀងរាល់ឆ្នាំ ចាប់តាំងពីឆ្នាំ២០០១មក បណ្តាញអង្គការ អភិរក្សធម្មជាតិក្រៅរដ្ឋាភិបាល និងស្ថាប័នរដ្ឋាភិបាល បានរាប់សត្វក្រៀលក្នុងពេលតែមួយ នៅតាមតំបន់ប្រមូលផ្តុំ សំខាន់ៗ ទាំងនៅក្នុងប្រទេសកម្ពុជា និងប្រទេសវៀតណាម ។ ឆ្នាំថ្មីៗនេះ ការរាប់បន្ថែមច្រើនដងត្រូវបានគេធ្វើ ឡើងនៅដើម និងពាក់កណ្តាលរដូវប្រាំង ដើម្បីសិក្សាតាមដានឱ្យកាន់តែច្បាស់អំពីចលនាបំណាស់ទីខ្លាត់ខ្លែងទៅមក របស់សត្វក្រៀល ដែលការប្រែប្រួលនេះគឺអាស្រ័យទៅតាមការផ្លាស់ប្តូរនៃកំរិតកំពស់ទឹក ។

សូមផ្តល់អំណរគុណ និងដឹងគុណយ៉ាងជ្រាលជ្រៅចំពោះ គំរោងអភិរក្សបឹងទន្លេសាបUNDP/GEF មូលនិធិ Critical Ecosystem Partnership មូលនិធិអភិរក្សសត្វព្រៃDisney និងសម្បុរសជននានា ដែលបាន ជួយឧបត្ថម្ភគាំទ្រថវិកា ជំរុញឱ្យការងារដែលបានរៀបរាប់ក្នុងរបាយការណ៍នេះសម្រេចបានជោគជ័យ និងបាន បង្ហាញនូវការប្តេជ្ញាចិត្តយ៉ាងមុះមុត ដើម្បីចូលរួមចំណែកពង្រឹងការអភិរក្សសត្វព្រៃនៅក្នុងប្រទេសកម្ពុជា ។

# **THE STATUS AND DISTRIBUTION OF LARGE WATERBIRDS IN THE TONLE SAP BIOSPHERE RESERVE, 2009 UPDATE**

**September 2009**

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# ACRONYMS

AWC	Asian Waterfowl Census
BCA	Biodiversity Conservation Area
CI	Conservation International
FA	Forestry Administration
FiA	Fisheries Administration
IFBA	Integrated Farming and Biodiversity Area
IUCN	International Union for the Conservation of Nature
MAFF	Ministry of Agriculture, Forestry and Fisheries
MIST	Management Information SysTem
MoE	Ministry of Environment
TSBR	Tonle Sap Biosphere Reserve
TSCP	Tonle Sap Conservation Project
WCS	Wildlife Conservation Society
WPO	Wildlife Protection Office

# SUMMARY

This report reviews new information on the seasonal status and distribution of large waterbirds in and around the Tonle Sap Biosphere Reserve (TSBR). It updates a detailed review published in 2008 by examining records collected from July 2008 to June 2009 through regular monitoring work in and around several key sites, in particular Boeung Tonle Chhmar and Stung Sen Core Areas, and the Integrated Farming and Biodiversity Areas (IFBAs) located in the outer grasslands of the floodplain. The report covers Lesser Adjutant (*Leptoptilos javanicus*), Greater Adjutant (*Leptoptilos dubius*), Painted Stork (*Mycteria leucocephala*), Milky Stork (*Mycteria cinerea*), Asian Openbill (*Anastomus oscitans*), Black-headed Ibis (*Threskiornis melanocephalus*), Spot-billed Pelican (*Pelecanus philippensis*), Oriental Darter (*Anhinga melanogaster*), Black-necked Stork (*Ephippiorhynchus asiaticus*), Woolly-necked Stork (*Ciconia episcopus*) and White-shouldered Ibis (*Pseudibis davisoni*).

The main objectives of this monitoring are:

- 1) To get a better understanding of seasonality of occurrence and abundance in the TSBR
- 2) To assess the significance of the protected and unprotected areas as feeding sites for non-, pre- or post-breeding birds
- 3) To highlight unusual bird aggregations that may indicate the presence of colonies other than those in Prek Toal
- 4) To identify gaps in data coverage and further survey or monitoring needs
- 5) To highlight threats faced within the TSBR away from the main colony site at Prek Toal

## I. Seasonality of occurrence and abundance

The pattern of occurrence for all species was generally similar to that found during the 2008 review, but more detail is now available, especially for the Boeung Tonle Chhmar and Stung Sen Core Areas, where continuous data were collected for the first time. There are still many unknowns and further monitoring and analysis is needed in future years.

### *Colonial species for which the TSBR is a major breeding area*

The main colonies for the eight species in this group are at Prek Toal Core Area, with one or two other sites for Oriental Darters and Lesser Adjutants. Most birds are concentrated at the colonies during the breeding season, with non-breeders either scattered around the lake or concentrated at a few key feeding sites. The pattern of movements after the breeding season varies strongly depending on the species. A detailed review for each species is presented in the text.

### *Non-colonial species for which TSBR appears to be mainly a non-breeding area*

There are three species in this group. In the study period Woolly-necked Stork and Black-necked Stork were found mainly in small numbers, in the outer floodplain and almost exclusively in the dry season. Both also breed, or have bred, in very small numbers. White-shouldered Ibis were only recorded in March and April from Baray and Veal Srongai IFBA, in the southeastern corner of the floodplain. They may also breed in the TSBR in low numbers.

## 2. Significance of sites

The data suggest that **Boeung Tonle Chhmar** is an important feeding site in the dry season and early wet season for most large waterbirds that breed colonially in the TSBR; this was also suggested in the 2008 review but has been reinforced by the new data. The **Stung Sen Core Area** seemed to be visited by waterbirds more in the wet season than in the dry season. At present the data do not indicate any exceptional value of this site for large waterbirds compared to other areas of the inner floodplain, with the possible exception of Spot-billed Pelicans. **Prek Toal** is of course the most important breeding site, but it also has significant numbers of Spot-billed Pelican, Oriental Darter and Lesser Adjutant staying in the area the whole year round. **Dey Roneath** continues to be of interest as a potential breeding colony (see below) but lacks year-round monitoring data. **Veal Srongai** was seen to be important for many of the large waterbirds that breed colonially in the TSBR. The nearby area of **Krous Kraom**, which was once grassland but is increasingly dominated by intensive agriculture, continues to be much used by many species considered in this report. Furthermore the IFBAs, including the **Stoung-Chikraeng IFBA** group, contain a wide diversity of species, including Black-necked Stork and Woolly-necked Stork. If confirmed, the suspected occurrence of breeding White-shouldered Ibises near Baray IFBA would raise the significance of that site since they are listed as Critically Endangered by IUCN.

## 3. Large aggregations that may indicate presence of a breeding colony

The 1,558 darters seen at **Dey Roneath** in January 2009 may have come from Prek Toal, but it is also possible that they were from breeding colonies nearby. A colony containing one hundred nests was found in Dey Roneath in 2007 and it may be that further colonies exist here. This area has never been properly surveyed to assess breeding of large waterbirds.

The large breeding season aggregations of several species witnessed at **Boeung Tonle Chhmar** also deserve some follow up searches in the area to check for nesting birds, as the area (including Moat Khla) has had breeding colonies in the past.

## 4. Gaps in coverage

The implementation of MIST in all Core Areas is a huge step forward. Together with the ongoing monitoring of the IFBAs this means that many of the known key sites in the north, east and southeast are fairly well covered. However, there is little coverage of the **south side of the floodplain, east of Prek Toal**. The **southeastern corner** of the floodplain, although partly covered by Stung Sen Core Area, Prey Koh Conservation Area and Veal Srongai and Baray IFBAs still seems to hold as yet undisclosed secrets. Further searches in this area might locate new populations of White-shouldered Ibis and Greater Adjutant.

The data reviewed in this report are collected by rangers, not professional ornithologists. This group of species presents fewer identification challenges than most taxonomic groups in Cambodia, but nonetheless errors are possible, and it is important that effort is spent on maintaining data quality. This should involve regular refresher courses and assessments of the identification skills and quality of data recording among the staff.

## 5. Threats

There are worries that uncontrolled developments in the outer floodplain are destroying much important habitat and may also have negative impacts on the overall ecosystem as dams and irrigation channels obstruct water flow and fish migration and heavy use of chemicals may pollute the environment and kill many living organisms. The establishment of invasive *Mimosa*

*pigra* is also often noted in areas with **dry season rice cultivation** (pers. obs.) probably due to seed import through earth moving equipment such as excavators and tractors. The increased contact between people and wildlife is not to the benefit of wildlife and hunting pressure may be increasing as a result.

The use of **poisons** within the Boeung Tonle Chhmar Core Area has been recently reported to be extensive (Heng Sokrith 2009) and this practice is likely to occur elsewhere as well. Besides using poisoned fish bait to kill waterbirds and other wildlife the **collection of bird eggs** from nests was also reported here, but the species were not identified. Such practices are also likely to occur elsewhere. Numerous **illegal fishing** practices are routinely employed throughout the floodplain, reducing fish stocks and damaging habitat.

Incidents of hunting with guns, spears, nets or traps are not often reported but many species of waterbirds, including some of those treated in this report, are still sold at markets in villages and towns around the lake (A. Yang, pers. comm.).

There is yet a lot of work to be done to get the extensive application of destructive practices under control.

## **ខ្លឹមសារសង្ខេប**

របាយការណ៍នេះពិនិត្យមើលឡើងវិញនូវព័ត៌មានថ្មីៗស្តីពីស្ថានភាព និងរបាយការណ៍រដូវកាលរបស់សត្វស្លាបទឹកធំ នៅក្នុង និងជុំវិញតំបន់បំបន្ថយជីវមណ្ឌលបឹងទន្លេសាប ។ របាយការណ៍នេះនឹងផ្តល់នូវព័ត៌មានថ្មីៗ និងលំអិតលើ របាយការណ៍ ដែលបានបោះពុម្ពកន្លងមកនៅឆ្នាំ២០០៨ ដោយធ្វើការពិនិត្យកំណត់ត្រាទិន្នន័យដែលបានប្រមូលចាប់ពី ខែកក្កដា ឆ្នាំ២០០៨ ដល់ខែមិថុនា ឆ្នាំ២០០៩ តាមរយៈការពិនិត្យតាមដានយ៉ាងទៀងទាត់នៅក្នុង និងជុំវិញតំបន់ សំខាន់ៗជាច្រើន ជាពិសេសតំបន់ស្នូលបឹងទន្លេសាប តំបន់ស្នូលស្ទឹងសែន និងតំបន់កសិដីរុចម្រុះ ដែលមានទីតាំងស្ថិតនៅ តំបន់វាលស្មៅនៃតំបន់ទំនាបលិចទឹក ។ របាយការណ៍នេះនឹងពិនិត្យមើលទៅលើប្រភេទសត្វស្លាបទឹកធំសំខាន់ៗដូចជា៖ ត្រដក់តូច (*Leptoptilos javanicus*) ត្រដក់ធំ (*Leptoptilos dubius*) រនាសពណ៌ (*Mycteria leucocephala*) រនាសស (*Mycteria cinerea*) ក្រៀលខ្យង (*Anostomus oscitans*) ត្រយ៉ងខ្លួនស (*Tbreskiornis melanogaster*) ទុងប្រផេះ (*Pelecanus philippensis*) ស្មៅញូ (*Anhinga melanogaster*) ដំបងក្រញ៉ង រីអង្កត់ខ្មៅ (*Ephippiorhynchus asiaticus*) កុកពាក់អំបោះ រឹសតូកសរ (*Ciconia episcopus*) និងត្រយ៉ងចំកំកស (*Pseudibis davisoni*) ។

គោលបំណងសំខាន់ៗនៃការពិនិត្យតាមដាននេះមានដូចជា៖

- ១) ដើម្បីស្វែងយល់អោយកាន់តែប្រសើរឡើងនូវវត្តមានតាមរដូវកាល និងរបាយរបស់សត្វស្លាបទឹកធំសំខាន់ៗនៅ ក្នុងតំបន់បំបន្ថយជីវមណ្ឌលបឹងទន្លេសាប (TSBR)
- ២) ដើម្បីធ្វើការវាយតម្លៃនូវសារៈសំខាន់តំបន់ការពារ និងតំបន់មិនមែនជាតំបន់ការពារ ដែលជាទីកន្លែងរកចំណី សំរាប់សត្វស្លាបដែលមិនបន្តពូជ និងតំបន់រកចំណីរបស់សត្វស្លាបមុន និងក្រោយពេលបន្តពូជ
- ៣) ដើម្បីធ្វើការកំណត់នូវការប្រមូលផ្តុំគ្នាខុសប្រក្រតី ដែលអាចបង្ហាញអោយឃើញថា មានវត្តមានបន្ទាយពងកូន ដែលមានក្រៅពីតំបន់ព្រែកទាល់
- ៤) ដើម្បីធ្វើការកំណត់នូវគម្លាតនៃការគ្របដណ្តប់ទិន្នន័យ និងតម្រូវការនៃការសិក្សាស្រាវជ្រាវ និងអង្កេតតាមដាន ដែលត្រូវអនុវត្តបន្ថែមទៀត
- ៥) ដើម្បីធ្វើការកំណត់នូវការគំរាមកំហែងសំខាន់ៗ ដែលប្រភេទទាំងអស់នោះកំពុងប្រឈមមុខ នៅក្នុងតំបន់ បំបន្ថយជីវមណ្ឌលបឹងទន្លេសាប ក្រៅពីបន្ទាយពងកូនព្រែកទាល់

### **១. វត្តមាន និងរបាយការណ៍រដូវកាល**

វត្តមានរបស់ប្រភេទទាំងអស់នោះ ដែលជាទូទៅពិនិត្យឃើញថាមានលក្ខណៈប្រហាក់ប្រហែល នឹងការសិក្សាស្រាវ ជ្រាវដែលបានរកឃើញនៅឆ្នាំ ២០០៨ ប៉ុន្តែបច្ចុប្បន្ននេះយើងទទួលបាន ព័ត៌មានលំអិតបន្ថែមទៀត ជាពិសេសសំរាប់

ព័ត៌មាន តំបន់ស្នូលបឹងទន្លេសាប និងតំបន់ស្នូលស្ទឹងសែន ដែលបន្តធ្វើការប្រមូលទិន្នន័យជាលើកដំបូង ។ មានព័ត៌មាន ជាច្រើនដែលមិនទាន់បានរកឃើញ ហើយចាំបាច់ត្រូវធ្វើការពិនិត្យ អង្កេតតាមដាន និងវិភាគបន្ថែមទៀតនៅឆ្នាំបន្ត បន្ទាប់ ។

**របៀបវិធីវិមណ្ឌលបឹងទន្លេសាបជាតំបន់បន្តពូជសំខាន់បំផុត សំរាប់ប្រភេទសត្វដែលបន្តពូជជាបន្ទាយ**

តំបន់ស្នូលព្រែកទាល់ គឺជាបន្ទាយពងកូនសំខាន់បំផុតសំរាប់ប្រភេទសត្វស្លាបទឹកធំ ៨ ប្រភេទ ។ ក្រៅពីតំបន់នេះ នៅមានមួយ វិធីវិមណ្ឌល តំបន់ទៀតក៏សំខាន់ផងដែរ សំរាប់ប្រភេទសត្វស្លាប និងសត្វត្រដក់តូច ។ សត្វស្លាបភាគច្រើនបាន ប្រមូលផ្តុំនៅតាមបន្ទាយពងកូននៅរដូវបន្តពូជ ហើយសំរាប់ប្រភេទដែលមិនទាន់បន្តពូជ គេសង្កេតឃើញមាននៅរាយ ហើយជុំវិញតំបន់បឹងទន្លេសាប រីឯនៅតាមតំបន់រកចំណីសំខាន់ៗមួយចំនួន ។

ការផ្លាស់ទីរបស់សត្វទាំងនោះបន្ទាប់ពីរដូវបន្តពូជ មានការប្រែប្រួលភាគច្រើនអាស្រ័យទៅតាមប្រភេទសត្វទាំង អស់នោះ ។ ព័ត៌មានលំអិតសំរាប់ប្រភេទនីមួយៗ គឺបានបង្ហាញផងដែរនៅក្នុងរបាយការណ៍នេះ ។

**ប្រភេទដែលមិនបន្តពូជជាបន្ទាយ ភាគច្រើនមានវត្តមាននៅក្រៅតំបន់បន្តពូជក្នុងរបៀបវិធីវិមណ្ឌលបឹងទន្លេសាប**

មានសត្វស្លាបបីប្រភេទនៅក្នុងក្រុមនេះ ។ នៅកំឡុងពេលធ្វើការសិក្សាស្រាវជ្រាវ សត្វកុកពាក់អំបោះ និងអង្កត់ខ្មៅ ត្រូវបានគេសង្កេតឃើញភាគច្រើនមានចំនួនតិចនៅតំបន់ដែលជាប់វាលទំនាបលិចទឹក ហើយចំនួននោះមានវត្តមានភាគ ច្រើននៅរដូវប្រាំង ។ សត្វទាំងពីរប្រភេទនេះបន្តពូជ វិធានបន្តពូជក្នុងតំបន់នេះមានចំនួនតិច ។ រីឯសត្វត្រយ៉ង់ចំកំសត្រូវ បានគេកត់ត្រាមានវត្តមាននៅខែមីនា និងខែមេសា នៅតំបន់បារាយ និងតំបន់វាលស្រងែ ដែលស្ថិតនៅខាងត្បូងឈាង ខាងកើតបឹងទន្លេសាប ។ ប្រភេទទាំងនេះប្រហែលជាបន្តពូជផងដែរនៅតំបន់បឹងទន្លេសាបក្នុងចំនួនតិច ។

**២. សារៈសំខាន់នៃតំបន់**

ទិន្នន័យបានបង្ហាញអោយឃើញថា **តំបន់ស្នូលបឹងទន្លេសាប** ជាតំបន់សំខាន់ សំរាប់ការរកចំណីនៅរដូវប្រាំង និង ដើមរដូវវស្សា របស់ប្រភេទសត្វស្លាបទឹកធំៗភាគច្រើនដែលបន្តពូជជាបន្ទាយនៅ តំបន់របៀបវិធីវិមណ្ឌលបឹងទន្លេសាប ហើយដែលទិន្នន័យទាំងនេះក៏បានបង្ហាញអោយឃើញផងដែរ នៅក្នុងរបាយការណ៍ឆ្នាំ២០០៨ ប៉ុន្តែត្រូវបានពិនិត្យបន្ថែម ដោយទិន្នន័យថ្មី ។

**តំបន់ស្នូលស្ទឹងសែន** ហាក់ដូចជាត្រូវបានប្រើប្រាស់ដោយហ្វូងសត្វស្លាបទឹក នៅរដូវវស្សាច្រើនជាង រដូវប្រាំង ។ នាពេលបច្ចុប្បន្ននេះទិន្នន័យមិនបានបង្ហាញ នូវលក្ខណៈខុសប្រក្រតីណាមួយនៃតំបន់នេះសំរាប់សត្វស្លាប ទឹកធំៗ ដោយប្រៀបធៀបទៅតាមតំបន់ផ្សេងទៀតនៅក្នុងតំបន់ទំនាបលិចទឹកនេះ ជាមួយនឹងលក្ខណៈពិសេសដែល អាចកើតមានចំពោះសត្វទុរេប្រវេណី ។ **តំបន់ស្នូលព្រែកទាល់** ពិតមែនជាតំបន់បន្ទាយពងកូនសត្វស្លាបសំខាន់បំផុត ប៉ុន្តែតំបន់នេះក៏ឃើញមានចំនួនច្រើនផងដែរចំពោះប្រភេទ ទុរេប្រវេណី ស្មៅព្យ ត្រដក់តូច ដែលពួកវារស់នៅក្នុងតំបន់នេះ ពេញមួយឆ្នាំ ។

**តំបន់ជីនាត** នៅតែជាតំបន់ដែលមានការចាប់អារម្មណ៍ថា ជាតំបន់បន្ទាយពងកូនដែលមានសក្តានុពល (សូមមើលតួរលេខខាងក្រោម) ប៉ុន្តែមានការខ្វះនូវទិន្នន័យអង្កេតតាមដានពេញមួយឆ្នាំ ។ **តំបន់វាលស្រងែ** ត្រូវបានគេ

សង្កេតឃើញថា ជាតំបន់សំខាន់ផងដែរសំរាប់ប្រភេទសត្វស្លាបទឹកធំៗដែលបន្តពូជជាក្រុម នៅតំបន់បំបនីយជីវមណ្ឌល បឹងទន្លេសាប ។ តំបន់ជាប់ **តំបន់គ្រួសក្រោម** ដែលជាតំបន់វាលស្មៅមួយផងដែរនោះ ត្រូវបានបន្តប្រើប្រាស់ច្រើនឡើង ដោយសត្វស្លាបជាច្រើនប្រភេទ ដែលបានរៀបរាប់នៅក្នុងរបាយការណ៍នេះ ប៉ុន្តែតំបន់នេះត្រូវបានគ្របដណ្តប់ច្រើនឡើង ដោយដំណាំកសិកម្មអតិថិជន ។ លើសនេះទៀត តំបន់កសិដីវិចម្រុះរាប់បញ្ចូលទាំងតំបន់**កសិដីវិចម្រុះស្មោង-ជីក្រែង** ដែលមានប្រភេទជីវិចម្រុះជាច្រើនរាប់បញ្ចូលទាំងប្រភេទសត្វ អង្កត់ខ្មៅ រីដបងក្រញូង កុកពាក់អំបោះ រឹសត្នកស ។ ប្រសិនបើមានភស្តុតាងបញ្ជាក់ឱ្យកាន់តែច្បាស់ លើការសង្ស័យថាមានសត្វត្រយ៉ងចំកំសរបន្តពូជ នៅក្បែរតំបន់កសិដីវិចម្រុះបារាយពិតមែន នោះវត្តមាននៃសត្វនេះនឹងធ្វើឱ្យតំបន់នេះកាន់តែមានសារៈសំខាន់ខ្លាំងថែមទៀត ព្រោះប្រភេទ សត្វត្រយ៉ងចំកំសនេះ ត្រូវបានគេចុះក្នុងបញ្ជីជាប្រភេទដែលទទួលរងគ្រោះបំផុតដោយ IUCN ។

**៣. ការប្រមូលផ្តុំគ្នារបស់សត្វស្លាបទឹកជាក្រុមចំណាត់ពីវត្តមាននៃបន្ទាយពងកូន**

ស្នេហាចំនួន ១ ៥៥៨ ក្បាល ត្រូវបានគេឃើញមានវត្តមាននៅ **តំបន់ដីរនាត** នៅខែមករា ឆ្នាំ២០០៩ ដែលសត្វ ទាំងអស់នោះអាចមកពីតំបន់ស្នួលព្រែកទាល់ ប៉ុន្តែពួកវាក៏អាចមកពីបន្ទាយពងកូន ដែលស្ថិតនៅក្បែរតំបន់នោះផងដែរ ។ បន្ទាយពងកូនស្នេហាដែលមានចំនួនមួយរយសំបុក ត្រូវបានគេរកឃើញនៅតំបន់ដីរនាតនៅឆ្នាំ ២០០៧ ហើយវាអាច មានបន្ទាយពងកូនថែមទៀតនៅតំបន់នេះ ។ តំបន់នេះមិនទាន់បានធ្វើការស្រាវជ្រាវ អោយបានច្បាស់លាស់ណាមួយ ដើម្បីធ្វើការវាយតម្លៃនូវការបន្តពូជ របស់ពពួកសត្វស្លាបទឹកធំៗនៅក្នុងតំបន់នេះឡើយ ។

ការប្រមូលផ្តុំគ្នាជាច្រើនប្រភេទនូវចំនួនដ៏ច្រើននៅរដូវបន្តពូជ បានបង្ហាញអោយឃើញថា តំបន់ **បឹងទន្លេសាប** គួរតែ ធ្វើការសិក្សាស្រាវជ្រាវតាមដាន ដើម្បីពិនិត្យស្វែងរកសត្វស្លាបធ្វើសំបុកពងកូន ដូចជា(តំបន់មាត់ខ្លា) ដែលធ្លាប់មាន បន្ទាយពងកូននៅទីនោះកាលពីមុន ។

**៤. ការខ្វះខាតលើការសិក្សាស្រាវជ្រាវ**

ការអនុវត្តកម្មវិធី MIST នៅក្នុងតំបន់ស្នួល គឺជាជំហានឆ្ពោះទៅមុខដ៏ធំមួយ ។ រួមគ្នាជាមួយនឹងការពិនិត្យតាម ដានដែលកំពុងបន្តនៅតំបន់កសិដីវិចម្រុះ ដែលទាំងនេះមានន័យថា តំបន់សំខាន់ៗដែលគេស្គាល់ជាច្រើនស្ថិតនៅផ្នែក ខាងជើង ខាងកើត ខាងត្បូងឈាងខាងកើត គឺត្រូវបានធ្វើការស្រាវជ្រាវច្បាស់លាស់គ្រប់ទីកន្លែង ។ ទោះជាយ៉ាងណា ក៏ដោយមានការស្រាវជ្រាវតិចតួចនៅឡើយ **នៅផ្នែកខាងត្បូងនៃតំបន់វាលទំនាបលិចទឹក និងតំបន់ខាងកើតតំបន់ព្រែក ទាល់ ។ នៅផ្នែកខាងត្បូងឈាងខាងកើតតំបន់វាលទំនាប** ភាគខ្លះនៅក្នុងតំបន់ស្នួលស្ទឹងសែន តំបន់អភិរក្សព្រៃកោះ តំបន់វាលស្រែង និងតំបន់កសិដីវិចម្រុះបារាយ ហាក់ដូចជាមិនទាន់បានធ្វើការសិក្សាស្រាវជ្រាវនៅឡើយ ។ ការសិក្សា ស្រាវជ្រាវនៅពេលបន្តទៀតនៅក្នុងតំបន់នេះ ប្រហែលជាអាចរកឃើញនូវចំនួនថ្មីប្រភេទត្រយ៉ងចំកំស និងត្រដក់ធំ ។

ទិន្នន័យដែលបានពិនិត្យឡើងវិញក្នុងរបាយការណ៍នេះ គឺបានប្រមូលដោយក្រុមឧទ្យានុរក្ស មិនមែនជាអ្នកដែលមាន ជំនាញខាងសត្វស្លាបនោះទេ ។ ក្រុមប្រភេទសត្វខាងលើនេះបង្ហាញអោយឃើញថា វាមានកាល់បាក់ក្នុងការរាប់ដែល ការរាប់ច្រើនធ្វើការប៉ាន់ប្រមាណចំនួនតិចជាងចំនួនពិតប្រាកដសរុបនៅក្នុងប្រទេសកម្ពុជា ។ ប៉ុន្តែទោះបីយ៉ាងណាក៏

ដោយភាពលំអៀងអាចកើតមាន ហើយវាមានសារៈសំខាន់ណាស់ដែលត្រូវព្យាយាមរក្សាគុណភាពទិន្នន័យ ។ ទាំងនេះ គួរតែអោយមានវគ្គបណ្តុះបណ្តាលរំលឹកឡើងវិញអោយបានទៀងទាត់ និងធ្វើការវាយតម្លៃលើជំនាញនៃការធ្វើអត្តសញ្ញាណកម្ម និងគុណភាពនៃការប្រមូលទិន្នន័យរបស់បុគ្គលិក ។

**៥. ការគំរាមកំហែង**

មានការបារម្ភជាច្រើនចំពោះការអភិវឌ្ឍន៍ដែលគ្មានការគ្រប់គ្រង នៅក្បែរតំបន់ទំនាបលិចទឹកដែលបំផ្លាញនូវ ជម្រក សំខាន់ៗជាច្រើន និងអាចមានផលប៉ះពាល់ជាអវិជ្ជមានដល់ប្រព័ន្ធអេកូឡូស៊ីដូចជា ការសាងសង់ទំនប់ និងការរៀបចំ បណ្តាញធារាសាស្ត្រ ដែលរាំងស្ទះដល់ចរន្តទឹកហូរ និងការផ្លាស់ទីរបស់ត្រី និងការប្រើប្រាស់ច្រើនលើសលប់នូវជាតិគីមី ដែលអាចបំពុលបរិស្ថាន និងសំលាប់នូវសារពាង្គកាយមានជីវិតជាច្រើន ។ ការកើតមានប្រភេទបន្លាយក្សដែលជាកត្តា ចង្រៃ តែងតែកាត់សំគាល់ឃើញមានផងដែរ នៅតំបន់ធ្វើកសិកម្មដំណាំស្រូវប្រាំង ប្រហែលជាដោយសារការនាំចូលគ្រាប់ ពូជតាមរយៈការផ្លាស់ទីសម្ភារៈដូចជា ម៉ាស៊ីនដឹកកាយ និង ត្រាក់ទ័រ ។ ការកើនឡើងនូវទំនាក់ទំនងរវាង មនុស្ស និង សត្វ គីមីនបានផ្តល់ផលប្រយោជន៍ដល់សត្វនោះទេ ហើយជាលទ្ធផលការគំរាមកំហែងដោយសារការបរាជ័យ អាចនឹង កើនឡើង ។

ការបំពុលសត្វនៅក្នុងតំបន់ស្តុលបឹងទន្លេសាប បានអោយដឹងនាពេលថ្មីៗនេះថាមានការកើនឡើង (ហេង សុភិក្ខុ ២០០៩) ហើយសកម្មភាពបែបនេះ ហាក់ដូចជាកើតមាននៅគ្រប់ទីកន្លែង ។ ក្រៅពីការប្រើប្រាស់ត្រីលាយជាមួយថ្នាំ ពុល ដើម្បីសំលាប់សត្វស្លាប និងសត្វផ្សេងទៀត ការប្រមូលពងសត្វស្លាបពីសំបុក ក៏មាននៅក្នុងរបាយការណ៍នេះផងដែរ ប៉ុន្តែមិនអាចធ្វើអត្តសញ្ញាណពងសត្វទាំងនោះបានឡើយ ។ ការប្រព្រឹត្តបែបនេះទំនងជាកើតមាន នៅទីកន្លែងជាច្រើន ផ្សេងទៀតផងដែរ ។ សកម្មភាពនេសាទខុសច្បាប់ជាច្រើន បានកើតមានឡើងជាដដែលៗនៅពេញតំបន់ទំនាបលិចទឹក ដែលធ្វើអោយកាត់បន្ថយផលស្តុកត្រី និងខូចខាតទីជម្រក ។

ការកើតមានឡើងការបរាជ័យដោយកាំភ្លើង ច្បូក មង រឺអន្ទាក់ មិនដែលត្រូវបានគេរាយការណ៍ជាញឹកញាប់នោះទេ ប៉ុន្តែប្រភេទសត្វស្លាបទឹកជាច្រើន រាប់បញ្ចូលទាំងប្រភេទដែលមាននៅក្នុងរបាយការណ៍នេះ នៅតែឃើញមានលក់នៅ លើទីផ្សារនៅតាមភូមិ និងទីប្រជុំជន នៅជុំវិញតំបន់បឹងទន្លេសាប ។

មានការងារជាច្រើននៅពុំទាន់បានធ្វើឡើង ដើម្បីទទួលបានការពង្រឹងបន្ថែមនូវការគ្រប់គ្រងលើសកម្មភាពបំផ្លាញ បំផ្លាញទាំងនោះនៅឡើយទេ ។

# INTRODUCTION

## Scope of the report

This report updates a detailed review published in 2008 by examining records collected from July 2008 to June 2009 through regular monitoring work in and around several key sites, namely Boeung Tonle Chhmar and Stung Sen Core Areas of the Tonle Sap Biosphere Reserve (TSBR), and the Integrated Farming and Biodiversity Areas (IFBAs) located in the outer

grasslands of the floodplain, mostly in the Transition Zone of the TSBR. Records from outside the breeding season in Prek Toal Core Area have also been examined and counts made during the Asian Waterfowl Census (January only) have been incorporated. The species reviewed are shown in Table 1. Most of these birds breed in the floodplain, primarily at the large colonies in the Prek Toal Core Area (Goes 2004, Clements *et al.* 2007).

**Table 1. Species reviewed in this report**

Species	IUCN Global Threat Category <sup>^</sup>	Bred at Prek Toal in 2008/9?
Lesser Adjutant ( <i>Leptoptilos javanicus</i> )	Vulnerable	Yes
Greater Adjutant ( <i>Leptoptilos dubius</i> )	Endangered	Yes
Painted Stork ( <i>Mycteria leucocephala</i> )	Near-threatened	Yes
Milky Stork ( <i>Mycteria cinerea</i> )	Vulnerable	Yes
Asian Openbill ( <i>Anastomus oscitans</i> )	Least Concern	Yes
Black-headed Ibis ( <i>Threskiornis melanocephalus</i> )	Near-threatened	Yes
Spot-billed Pelican ( <i>Pelecanus philippensis</i> )	Near-threatened	Yes
Oriental Darter ( <i>Anhinga melanogaster</i> )	Near-threatened	Yes
Black-necked Stork ( <i>Ephippiorhynchus asiaticus</i> )	Near-threatened	No
Woolly-necked Stork ( <i>Ciconia episcopus</i> )	Least Concern	Yes (1 pair)
White-shouldered Ibis ( <i>Pseudibis davisoni</i> )	Critically Endangered	No

<sup>^</sup>BirdLife International (2008)

The main objectives for conducting this review for the above species were:

- 1) To get a better understanding of seasonality of occurrence and abundance in the TSBR
- 2) To assess the significance of particular sites for non-, pre- or post-breeding birds
- 3) To highlight unusual bird aggregations during the breeding season that may indicate the presence of colonies other than those in Prek Toal
- 4) To identify gaps in data coverage and further survey or monitoring needs
- 5) To highlight threats faced within the TSBR away from the main colony site at Prek Toal.

Other monitoring reports in this series address the status of Bengal Floricans (Evans *et al.* 2009a; Gray *et al.* 2009), the non-breeding distribution of Sarus Cranes *Grus antigone* (Evans *et al.* 2009b, Evans *et al.* 2008, Nguyen Phuc Bao Hoa 2007) and the development of the multi-species breeding colonies at Prek Toal (Clements *et al.* 2007b, Sun Visal 2009, Sun Visal and Clements, 2008).

## Data

Most of the data used in this report are from long-term monitoring work at sites where conservation work is being implemented. This includes the TSBR Core Areas and the

IFBAs. This is the first year that MIST is being implemented in the Core Areas and this has resulted in the collection of much useful data, which allows us to look at the seasonal use of these sites by the target species. Note that data recording in Boeung Tonle Chhmar using MIST started in October 2008 so no information was recorded for July, August and September. Furthermore June 2009 data for Stung Sen Core Area were not available at the time of writing.

Such continuous monitoring of the sites over time will give us a much better understanding of seasonal patterns and allow us to see trends in the numbers of birds using the Core Areas. Data from Prek Toal (also collected through MIST) has only been used for the non-breeding season and then only in the maps – as we especially wanted to get a better understanding of bird distribution and numbers at sites other than Prek Toal. For more data on waterbirds at Prek Toal see the annual colony monitoring report (Sun Visal 2009).

At the IFBAs data on target species are also collected by patrol teams during continuous monthly patrols. Additional data has also been used from the Asian Waterfowl Census for Dey Roneath, Preah Net Preah and Boeung Tonle Chhmar.

Most of the data are from a few sites located on the eastern and northern parts of the floodplain. For a better understanding of bird movements around the Tonle Sap Lake as a whole it would be good to include sites on the southern side of the lake in the future. We are therefore looking forward to obtaining data in the future from a site on the western side of the lake, between Dey Roneath and the delta, where CI and the Fisheries Administration have begun a new conservation project. Obtaining data from Dey Roneath itself would also be valuable, although this is not currently possible due to resource constraints.

### **Structure of the species accounts**

Each species account starts with a brief update on breeding status in the TSBR obtained from the colony monitoring work if applicable (see also Sun Visal 2009). For species with many records an overview is first given by means of a chart. For all species a map has been made that shows the distribution of records (maps can be found in the map section at the end of the report) and detailed data are presented for sites where the species has been recorded regularly. The site records are followed by a review and/or comments on the significance of the data.

# SPECIES ACCOUNTS

## Lesser Adjutant

*Leptoptilos javanicus*

### Breeding in the TSBR

In 2009, 348 breeding pairs were counted at Prek Toal (this is only a portion of the total Prek Toal breeding population, which may be as much as twice this size) with birds nesting from approximately January to June. Small groups are also sometimes seen at Prek Toal in the flood season (August–November). Numbers were seen to increase substantially in November indicating the arrival of nesting birds. Small colonies are

found from time to time away from Prek Toal, but these tend to be abandoned quickly due to human disturbance. The historic nesting colonies shown in the map may have been either Lesser or Greater Adjutants or both.

### Overview of distribution records

There were 57 records away from Prek Toal in 2009. These are summarized in the chart below and Map 1 in the Map Section.

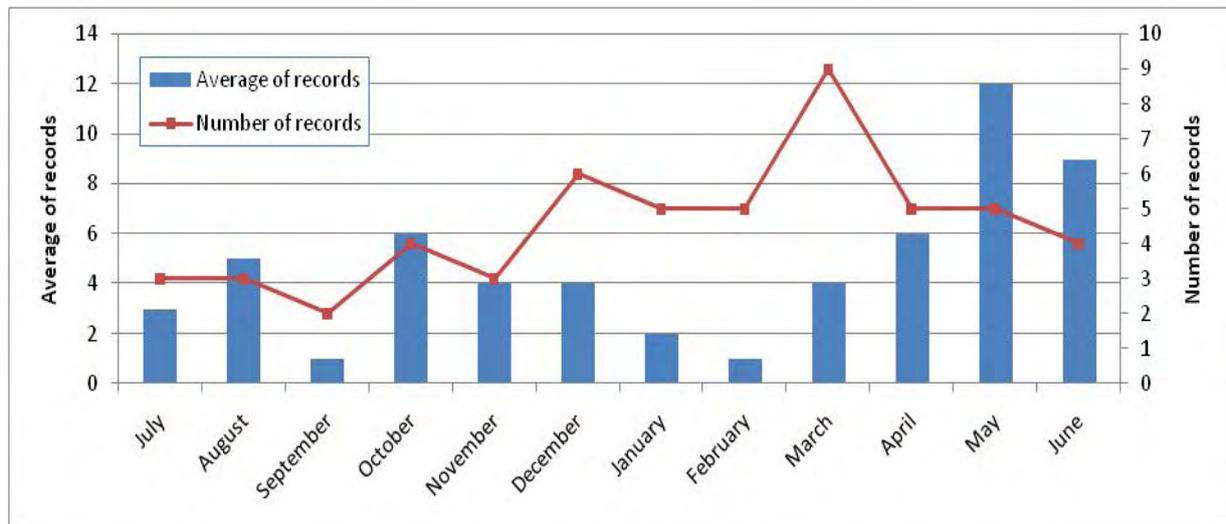


Figure 1. Graph showing monthly data on average number of Lesser Adjutants per record (sighting) and the number of records per month. For all sites except Prek Toal.

### Site records

#### Boeung Tonle Chhmar Core Area

Data recording began in October 2008. There were 10 records from Boeung Tonle Chhmar (18% of total), between January and May. Numbers peaked in March and April, with seven out of ten records made in these two months and maximum group sizes of 16 and 13 for March and April respectively. Only singles or pairs were recorded in other months.

#### Stung Sen Core Area

Singles and pairs were recorded infrequently one or two times a month for eight of the eleven months available. There were ten records in total. One group of four birds was recorded in July 2008.

#### IFBAs

There were 37 records from the IFBAs, with 25 (68%) coming from Veal Srongai and the adjacent area to the east. Lesser Adjutants were recorded in this area from nine

months, including the period of high water level. Group size was mostly 1-12 birds, but on the 20<sup>th</sup> of May a large flock of 46 birds was observed. In Baray and Stoung-Chikraeng group sizes were typically of singles or pairs, except for a group of 9 birds in November (Stoung-Chikraeng) and a group of eight birds in June (Baray).

## Review

Lesser Adjutants generally seem to be fairly widespread and are present in the Tonle Sap floodplain throughout the year. However, they occur at low densities. Generally there are only 3-5 records with group sizes varying between 1-12 birds each month from all the regularly monitored sites combined. Boeung Tonle Chhmar seemed to be mainly used as a feeding site in the late dry season, with medium-sized aggregations of up to 16 birds observed.

A particularly large group of 46 birds was observed in the area east of Veal Srongai at the end of May. This is the largest aggregation of Lesser Adjutants witnessed in the Tonle Sap floodplain, away from Prek Toal, since 2002. It is possible this group consisted of failed or early breeders from Prek Toal (where the breeding season ends in June). Large aggregations of 80-200 birds were seen in this part of the floodplain from March to May prior to 2003 and the regularity of such appearances of large groups in this time also raises the possibility

## Greater Adjutant

*Leptoptilos dubius*

### Breeding in the TSBR

In 2009 at Prek Toal 123 breeding pairs were estimated based on count data (this is only a portion of the total Prek Toal breeding population, which may be as much as twice this size). The breeding season runs from January to June. The historic nesting colonies shown in the map may have been either Lesser or Greater Adjutants or both.

that they may be post-breeding flocks from other regions (van Zalinge *et al.* 2008). For instance breeding typically ends in February in Preah Vihear (Clements *et al.* 2007).

Another possibility, we would like to put forward for consideration is that non-breeders may be drawn periodically to such areas as Veal Srongai, due to disturbance created by rising flood waters, which may briefly lead to an increase in food availability. The southeastern corner of the floodplain has a lot of grasslands and particularly where flooded forests change into more open grasslands, hunting should be particularly rewarding for waterbirds waiting for ground animals that are forced to move out of the inner floodplain as floodwaters rise.

## Comments

The 2008/9 data is in line with earlier findings on Lesser Adjutant distribution and movements within the floodplain of the Tonle Sap lake (van Zalinge *et al.*, 2008). With the new data from Boeung Tonle Chhmar and Stung Sen Core Areas we can confirm that both these areas are used by Lesser Adjutants to a limited extent. The data strengthen earlier suggestions that a significant number of Lesser Adjutants remain in the floodplain throughout the year. It is notable that no large post-breeding flocks have ever been recorded in the floodplain during June-July.

**Site records** (see also Map 2 in Map Section)

### Boeung Tonle Chhmar Core Area

There were five separate records. Single birds were recorded every month from October-December. This was followed by a group of 5 birds in May. The last record was again of a single bird in June.

### Stung Sen Core Area

There were only three records, once of a single bird and twice of a pair, which all came from a very short period between 7-20 October.

### **Comments**

These records are consistent with previous data. It is not clear where the majority of Cambodia's Greater Adjutants spend the non-breeding season. Greater Adjutants are rarely seen in the Tonle Sap floodplain away from Prek Toal at any season, but large

groups appear sporadically in certain areas from May-July, particularly in June and July, as well as December. Most of the previous records of large aggregations (32-84 birds) were from the southeastern corner of the floodplain (most recently in 2004), but there were also two previous records from Boeung Tonle Chhmar of 70 and 84 birds from as far back as 1998 and 2000, respectively. It is worrying that such large aggregations haven't been seen in recent years. Conducting extensive searches in May-July in the southeastern corner of the floodplain might reveal whether such aggregations still occur.

## **Painted Stork**

*Mycteria leucocephala*

### **Breeding in the TSBR**

In 2007 the total size of the breeding population at Prek Toal was estimated at 3,121 pairs that bred from approximately January to June.

### **Overview of distribution records**

There were 58 records away from Prek Toal in 2009. These are summarized in Figure 2 below and Map 3 in the Map Section.

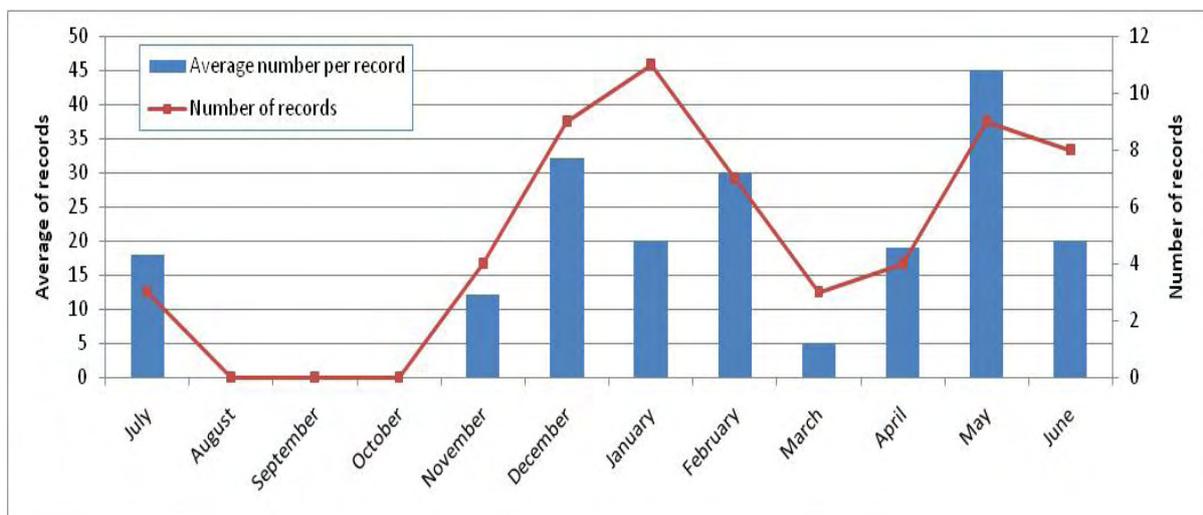


Figure 2. Graph showing average number of Painted Storks recorded per month and the number of records per month (for all sites except Prek Toal)

### **Site Records**

#### Boeung Tonle Chhmar Core Area

There were 14 records from Boeung Tonle Chhmar (24% of total records) with all records coming from April-June, except for

one record of 7 birds in January. There were three records in April with a maximum group size of 60 birds (average group size 25), 7 records in May (maximum 150, average 52) and 3 records in June (maximum 7, average 3).

## **IFBAs**

The former Krous Kraom grasslands, now an agricultural belt, had the highest number of records ( $n = 21$ , 36% of total records). Painted Storks were also recorded from all other IFBAs in the outer floodplain with 13 records from Baray (22% of total) and 9 records from the Stoung-Chikraeng IFBA group (16% of total). There were no records made in the entire Tonle Sap area from August to October. Painted Storks first started arriving in the outer floodplain in November (four records from Baray IFBA) and were most numerous from December to February. Total numbers recorded in the outer floodplain seemed fairly consistent over these three months with 9 records in December (average group size 28), 9 records in January (average group size 18) and 7 records in February (average group size 41). In March numbers dropped sharply with only three records of small groups and in April only a single bird was recorded. In May there were two records of around 20 birds each and in June the numbers increased almost to the early dry season levels, with five records (average group size 28).

## **Other sites**

There was one record of 24 Painted Storks in January in grasslands in the northwestern corner of the floodplain, in Preah-Net-Preah district.

## **Review**

From Figure 2 it can be seen that Painted Storks were not recorded in the Tonle Sap floodplain from August-October. Numbers

## **Milky Stork**

*Mycteria cinerea*

## **Breeding in the TSBR**

In 2009 eight breeding pairs were counted at Prek Toal (Sun Visal 2009).

peak from December-February, with records almost entirely within the grasslands and agricultural areas of the outer floodplain. As these birds seem to stay in this area until the middle of the dry season we can consider these non-breeders. These groups then leave the outer floodplain as the dry season progresses, probably moving deeper into the floodplain. Painted Storks seemed to use Boeung Tonle Chhmar from April to June, indicating that this is a late dry season feeding site. Although numbers clearly peaked in May at Boeung Tonle Chhmar, with fairly large groups observed, it is not known at present if these were early post-breeding birds or that this is the peak period for the arrival of non-breeding birds at this site.

## **Comments**

The 2008/9 data is in line with earlier findings on Painted Stork distribution and movements presented in van Zalinge *et al.* 2008. The 2009 data, which includes such inner floodplain sites as Boeung Tonle Chhmar, is further evidence that non-breeding Painted Storks mainly feed in a mix of grassland and agricultural areas in the outer floodplain in the early dry season, moving closer to the lake as conditions get drier. It is likely that during this time they will concentrate at a more limited number of important wetlands such as Boeung Tonle Chhmar. Despite the large size of the main colony, there is no clear evidence of pre- or post-breeding aggregation occurring within the monitored sites and it is possible that most breeders directly move to and from the Prek Toal colony to sites outside the floodplain.

## **Overview of distribution records**

There were no records away from Prek Toal in 2009.

# Asian Openbill

*Anastomus oscitans*

## Breeding in the TSBR

The 2009 partial estimate of the breeding population at Prek Toal was 11,364 pairs (Sun Visal 2009). The real figure could be much higher. The breeding season is approximately from February to June.

## Overview of distribution records

There were 115 records away from Prek Toal in 2009. These are summarised in Figure 3 below and Map 4 in the Map Section.

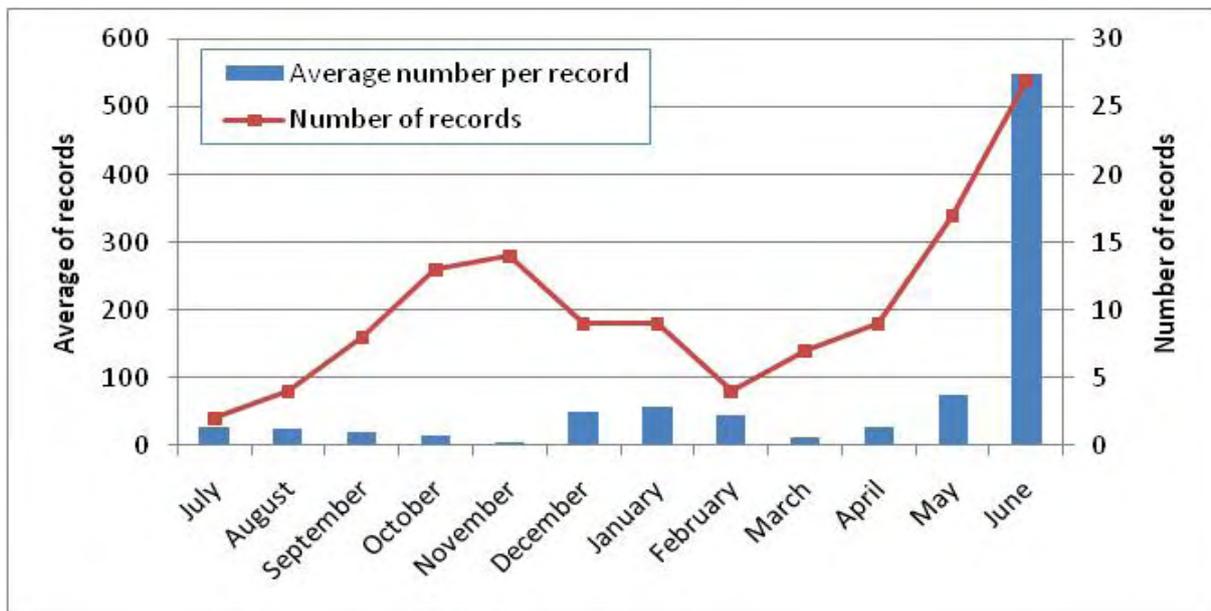


Figure 3. Graph showing average number of Asian Openbills recorded per month and the number of records per month (for all sites except Prek Toal)

## Site Records (see also Map 4 in Map Section)

### Boeung Tonle Chhmar Core Area

Although data recording began late BTC had the highest number of records of Asian Openbill (n=60, 49% of total records) of all sites. Between November and April there were 1-9 records each month, with monthly averages of 4-15 birds per record and maximum group sizes of 4-50. Larger groups tended to be observed in March and April than in preceding months. Maximum group size dramatically increased from 50 in April to 867 in May to over 13,000 in June. The number of records also increased during these months from 9 in April (average group size of 15 birds) to 16 in May (average group

size of 79 birds) and to 19 records in June (average group size, 732 birds). The huge record of more than 13,000 Asian Openbills in June was actually of several large flocks flying overhead. However, it was confirmed by MoE staff working at Boeung Tonle Chhmar that large numbers of Asian Openbills could be found feeding around the lake from May-June, as the data suggest.

### Stung Sen Core Area

Twenty records of Asian Openbills were made in between September – December (3-7 records per month), with one record of a single bird in May. Group sizes from September to December ranged from 1-7 birds.

## Dei Roneath

150 Asian Openbills were counted during the Asian Waterfowl Census on 20 January.

## IFBAs

Veal Srongai and agricultural fields close by, had the most records (23), followed by Baray (6) and then the Stoung/Chikraeng IFBAs with only a single record of two birds. Asian Openbills were not recorded in any of the outer grasslands and agricultural areas during the driest months of March-May. The largest groups were seen in June (350 birds in Veal Srongai and 200 birds in Baray), followed by January (200 birds in Veal Srongai) and December (200 birds in Veal Srongai and 65 birds in Baray). However it seems that Asian Openbills are particularly common in the Veal Srongai area during high water levels from August – October, with almost half the records for this site coming from these three months and with averages of 20-55 birds per sighting.

## **Review**

Figure 3 clearly shows that from July to November average group size decreased while the number of separate records increased, indicating that as the wet season progresses and water levels increased Asian Openbills scattered in to progressively smaller clusters (over a wider area). These data are all from the south-eastern corner of the floodplain as there were no records of Asian Openbills in that period from Boeung Tonle Chhmar (no data collected from July-September) and the Stoung-Chikraeng IFBA group.

In December and January Asian Openbills were clearly aggregating into larger groups as more birds arrived. These aggregations can be considered pre-breeding aggregations and again were only recorded from the south-east corner of the floodplain. In February we can see that the number of groups declined although the average number of birds per group was still high. These were probably groups of non-breeding birds. From March to May no Asian Openbills were recorded in the outer sections of the floodplain as birds probably started to move deeper into the floodplain. This is supported by the increase in numbers of Asian Openbills at Boeung Tonle Chhmar witnessed especially from March.

The huge increase in numbers at BTC during May and particularly June presumably shows the arrival of post-breeding birds dispersing from the colonies in Prek Toal. Asian Openbills also were seen returning to the area near Veal Srongai IFBA in large numbers in June.

## **Comments**

The 2008/9 data is in line with earlier findings on Asian Openbill distribution and movements within the floodplain of the Tonle Sap lake (van Zalinge *et al.*, 2008). With the new data from Boeung Tonle Chhmar and Stung Sen Core Areas we can confirm that Boeung Tonle Chhmar is still an important post-breeding feeding site. The 2009 data also strengthen our earlier findings on the importance of the south-eastern corner of the lake as a feeding ground.

## **Black-headed Ibis**

*Threskiornis melanocephalus*

### **Breeding in the TSBR**

Although Black-headed Ibis breed at Prek Toal from January to June, it is difficult to estimate their numbers as they mostly breed in thick scrub. A total of 43 nests was counted from platforms in 2009, but the real number is surely a lot higher. Prek Toal is the only known breeding site for this species in Cambodia.

### **Site Records (see also Map 5 in Map Section)**

#### IFBAs

Records of Black-headed Ibis away from Prek Toal only came from the area near Veal Srongai IFBA. Birds were observed here in the early dry season, in January (three records from Veal Srongai on two consecutive dates, thus possibly overlapping) and February (one record) and then again in the early wet season in June (two records). Group size ranged from 6-21 birds during both periods.

## **Spot-billed Pelican**

*Pelecanus philippensis*

### **Breeding in the TSBR**

In 2007 the total size of the breeding population at Prek Toal was estimated at 2,592 pairs that bred from approximately January to June. Small groups are sometimes seen at Prek Toal in the flood season (August-November) as well.

### **Comments**

The records of Black-headed Ibis may seem few, but the numbers encountered in the southeastern corner of the floodplain have always been quite variable and it seems that most birds breeding in Prek Toal may move through the northwestern floodplain towards Ang Trapeang Thmor, where over a thousand Black-headed Ibises arrive each year in June-July and stay throughout the wet season. There are only scattered records from around the Tonle Sap and Mekong rivers in the wet season, suggesting that a small proportion of the population moves south-east. For instance, in 2008 the highest number of Black-headed Ibis recorded at any one time in the southeastern corner was 13, in 2007 it was 18, in 2006 there were no records, in both 2005 and 2004 there were 53, and in 2003 one group of 123 birds was recorded at the end of July in the very outer part of the floodplain.

Numbers were seen to increase substantially in November indicating the arrival of nesting birds.

### **Overview of distribution records**

There were 63 records away from Prek Toal in 2009. These are summarized in Figure 4 below and Map 6 in the Map Section.

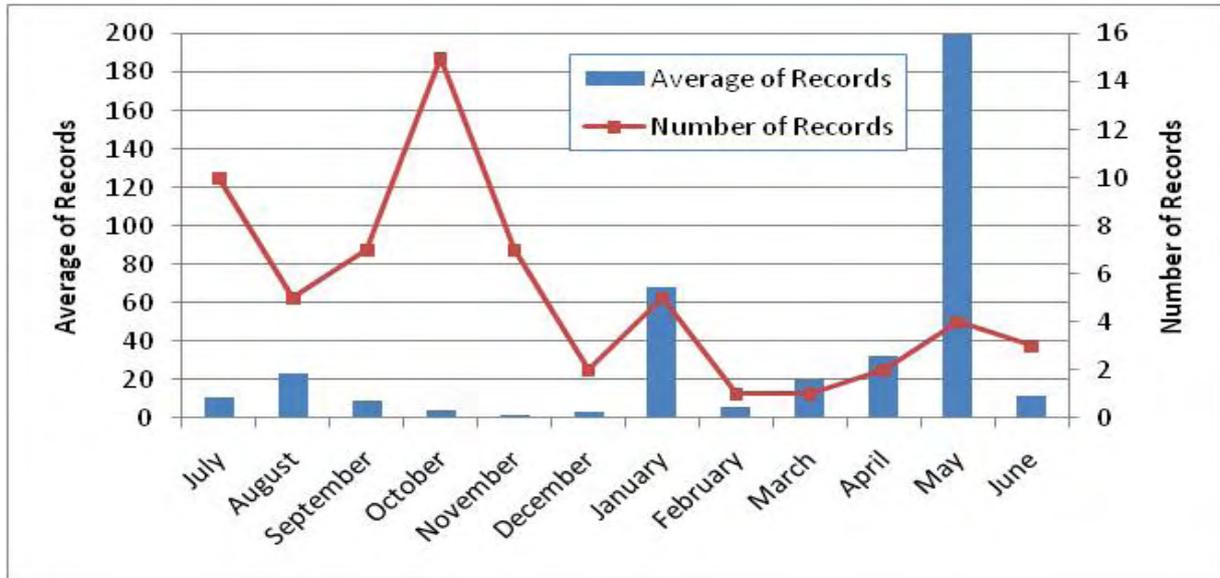


Figure 4. Graph showing monthly data on average number of Spot-billed Pelicans per record (sighting) and the number of records per month. For all sites except Prek Toal.

## Site records

### Boeung Tonle Chhmar Core Area

Data recording began in October 2008. There were 20 records from Boeung Tonle Chhmar (32% of total), with sightings in 8 out of 9 months since data collection started. Group sizes were higher from January-June (average of 67 birds per month) than October-December (average of 2 birds per month). However, numbers strongly peaked in May with very large groups of 250 and 500 pelicans recorded on 15<sup>th</sup> and 19<sup>th</sup> May respectively. The highest number of records came from November, with 7 records (35% of total) of small groups (1-3 birds). In November, pelicans were only recorded from Prek Toal and Boeung Tonle Chhmar.

### Stung Sen Core Area

There were 26 records (41%). All records came from July-October except for one record of 4 birds in December. Peak numbers were observed here in July and August with groups of as much as 25 and 50 birds, respectively. Group size decreased strongly in September and October, but the total number of records remained roughly

the same, with 4-9 records made each month from July-October.

### IFBAs

Almost all records (14/15) came from Veal Srongai, with one record of an overflying bird in Baray IFBA in June. Sightings were made between July 2008 and February 2009. Average group sizes were highest in August and September, 37 and 20, respectively, but numbers were also high in October (more records of smaller groups). During November and December there were no records with a sudden peak in January when one group of 27 and one group of 107 birds was seen. There was only one record of six birds in February.

### Other sites

The Asian Waterfowl Census in January recorded 80 pelicans in Dei Roneath and 109 at Preah-Net-Preah (Boeung Kdeap Kdam) in the northwestern corner of the floodplain.

## Review

As can also be seen from Map 6, most records came from the inner floodplain and pelicans are recorded around the lake

throughout the year. The number of Spot-billed Pelicans peaked strongly at Boeung Tonle Chhmar in May, possibly indicating dispersal of breeders from Prek Toal. In the southeastern corner, as seen from Stung Sen Core Area and Veal Srongai IFBA, pelicans were mainly present during the wet season and early dry season. Numbers peaked slightly here in August and September and more so in January. The January group of 107 was of birds flying over and perhaps they were a flock migrating towards the Tonle Sap from southern regions.

### Comments

The 2008/9 data is in line with earlier findings on Spot-billed Pelican distribution

and movements within the floodplain of the Tonle Sap lake (van Zalinge *et al.*, 2008). With the new data from Boeung Tonle Chhmar and Stung Sen Core Areas we can confirm that both these areas are used by pelicans although at different times of the year. Boeung Tonle Chhmar can be considered a dry season and possibly also a post-breeding feeding site, while the Stung Sen Core Area is a wet season feeding site. The data strengthen earlier suggestions that a significant number of pelicans remain in the floodplain throughout the year, and during high water levels significant numbers can be found in the southeastern corner of the floodplain (and the delta).

## Oriental Darter

*Anhinga melanogaster*

### Breeding in the TSBR

In 2009 the total size of the breeding population at Prek Toal was 7,308 pairs, breeding from approximately September to January. Fairly large numbers are seen at Prek Toal in the non-breeding season as well.

### Overview of distribution records

There were 372 records away from Prek Toal in 2009. These are summarized in Figure 5 below and Map 7 in the Map Section.

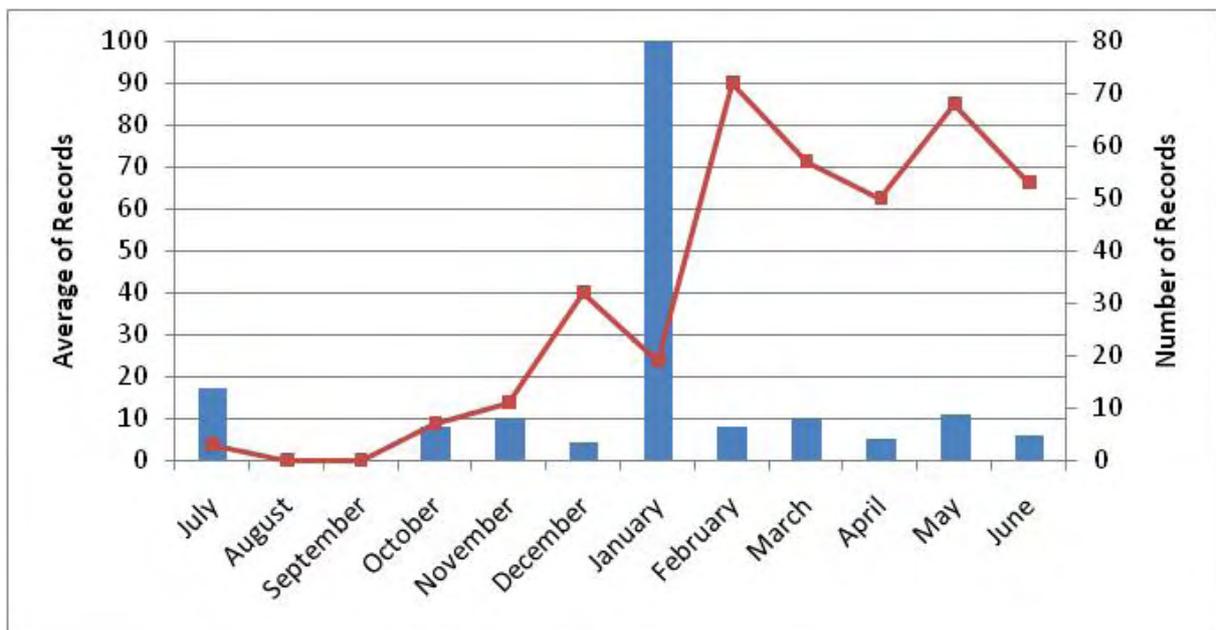


Figure 5. Graph showing monthly data on average number of Oriental Darters per record (sighting) and the number of records per month. For all sites except Prek Toal.

## **Site Records**

### **Boeung Tonle Chhmar Core Area**

Data recording began in October 2008. There were 332 records from Boeung Tonle Chhmar (89% of total), with sightings in all months since data collection started. Maximum monthly group sizes ranged from 16 (in November and December) to 315 (January). Average group size was fairly constant over all months, ranging from 4-11 birds per sighting, except for in January (average of 26). However, the number of records per month increased sharply post breeding, from 9-26 in the period November-January to 52-66 from February-June.

### **Stung Sen Core Area**

There were 32 records (9%). The number of sightings was fairly constant at 2-3 records, but with peaks in February (8 records) and October (7) and no records in June and August. Examining the average group size per month indicates group sizes were lowest in the dry season, with 2-4 birds per record from January-April, except in February, which was more similar to the period October-December with averages of 8-11 birds per record. The months of May and June had the highest averages with 18 and 17 birds per record, respectively.

### **IFBAs**

There were only six records from the IFBAs. All were made in March and April, with two records coming from Baray IFBA and four records from Veal Srongai IFBA. Sightings were of singles and small groups ranging from 2-5 individuals. They may be slightly under reported from IFBAs however as the teams do not always keep records on this species (pers. obs.).

### **Other sites**

The Asian Waterfowl Census in January resulted in 1,558 darters being counted in Dey Roneath on the western side of the

Tonle Sap, but only six at Preah-Net-Preah (Boeung Kdeap Kdam) in the northwestern corner of the floodplain.

## **Review**

Oriental Darters are largely restricted to the inner floodplain, with significant numbers around the lake the whole year. Prior to and during the breeding season, particularly from July-January, most darters seem to be concentrated in the Prek Toal area (and possibly at other breeding areas like Dey Roneath). Presumed non-breeders are recorded from Boeung Tonle Chhmar and Stung Sen Core Areas in moderate numbers during this time. In January, when a significant portion of the Prek Toal chicks had likely already fledged, large, presumably post-breeding groups (of up to 315 birds) were found at Boeung Tonle Chhmar. The very large total count of 1,558 darters at Dey Roneath in January may have been of birds from a local colony as there have been regular reports of a breeding colony in this area. From February-July numbers around BTC stay high, indicating this is an important dry season feeding site, but the darters are by then usually encountered in smaller groups. The Stung Sen Core Area is also used by darters throughout the year, albeit in lower numbers, with only slight variations. Numbers are lowest during the dry season, except for February when some groups move through the area.

## **Comments**

The 2008/9 data are in line with earlier findings on Oriental Darter distribution and movements within the floodplain of the Tonle Sap lake (van Zalinge *et al.* 2008). With the new data from Boeung Tonle Chhmar and Stung Sen Core Areas we can confirm that both these areas are used regularly by darters. In particular Boeung Tonle Chhmar can be considered important as a dry season and post-breeding feeding site. The large numbers of darters recorded at Dey Roneath in January strengthens the suspicion that there is an annual breeding colony here.

## Black-necked Stork

*Ephippiorhynchus asiaticus*

### Breeding in the TSBR

A pair of Black-necked Storks bred at Prek Toal in 2004 and 2005 (Sun Visal 2005) but have not been found since.

**Site records** (see also Map 8 in Map Section)

#### Stung Sen Core Area

One record of a single bird in February.

#### IFBAs

There were six records of single birds from January to April from Baray and Stoung-Chikraeng IFBAs and the agricultural belt, interspersed with grassland, east of Veal Srongai.

## Woolly-necked Stork

*Ciconia episcopus*

### Breeding in the TSBR

One pair of Woolly-necked Storks is recorded breeding at Prek Toal each year.

**Site records** (see also Map 9 in Map Section)

#### IFBAs

There were 20 records from 25 December 2008 – 18 July 2009, 17 of them between January and April. Almost 50% (9/20) of

### Comments

The 2008/9 data support earlier observations that Black-necked Storks seem to occur at very low densities in the Tonle Sap floodplain and seem to be largely restricted to grasslands in the outer floodplain, which they use in the dry season (van Zalinge *et al.* 2008). Last year larger groups (up to 6 birds) were recorded in the IFBAs, particularly at Stoung-Chikraeng. Black-necked Storks have not been recorded from Boeung Tonle Chhmar since 1998. It was presumed that this was because of a lack of surveys and data collection (van Zalinge *et al.* 2008), but with an absence of records throughout the dry season this year it seems that they may be only occasional visitors to such wetlands which are located well within flooded forest habitat. The single record from Stung Sen also suggests a lower preference for flooded forest habitat.

observations were of single birds. Maximum group size recorded was 18 birds.

### Comments

Previous data indicate Woolly-necked Storks mostly visit grassland areas in the outer floodplain in low numbers in the dry season with sporadic records during the wet season. The absence of records from Boeung Tonle Chhmar and Stung Sen in 2008/9 also suggests this species largely avoids the flooded forests, except for the pair at Prek Toal.

# White-shouldered Ibis

*Pseudibis davisoni*

**Site records** (see also Map 10 in Map Section)

## IFBAs

Observations of White-shouldered Ibis were made from 18-23<sup>rd</sup> March at two IFBAs. There were two records of a single bird from the same approximate location within a five-day period in Veal Srangai IFBA and this therefore is likely to have been the same individual. A family group of three birds (2 adults and a juvenile) was seen on two consecutive days in the northern section of Baray IFBA and a single bird seen flying in the southern section of Baray IFBA several days later.

## **Comments**

Previous data also suggests that March and April is the main time in which White-shouldered Ibises can be found feeding in grasslands in the south-eastern corner of the floodplain. The sightings seem to indicate that White-shouldered Ibis use the IFBAs only briefly in the later stage of the dry season. It is not yet known if they use other areas of the floodplain for longer periods of time or if they are breeding around the Tonle Sap. However, ornithologists believe that White-shouldered Ibises do not make long distance migrations. The sighting of a family group towards the end of March is encouraging, suggesting that there may be a small, but successful, breeding population somewhere in the south-eastern corner of the Tonle Sap floodplain.

# DISCUSSION

This review had five main objectives:

- 1) To get a better understanding of seasonality of occurrence and abundance in the TSBR
- 2) To assess the significance of the conservation- and other areas, as feeding sites for non-, pre- or post-breeding birds
- 3) To highlight unusual bird aggregations during the breeding season that may indicate the presence of colonies other than those in Prek Toal
- 4) To identify gaps in data coverage and further survey or monitoring needs
- 5) To highlight threats faced within the TSBR away from the main colony site at Prek Toal

The conclusions are treated in turn below.

## ***1. Seasonality of occurrence and abundance***

The pattern of occurrence for all species was generally similar to that found during the 2008 review, but more detail is now available, especially for the Boeung Tonle Chhmar and Stung Sen Core Areas, where continuous data was collected for the first time. There are still many unknowns and further monitoring and analysis is needed in future years.

*Non-colonial species for which TSBR appears to be mainly a non-breeding area*

There are three species in this group. In the study period **Woolly-necked Stork** and **Black-necked Stork** were found mainly in small numbers, in the outer floodplain and almost exclusively in the dry season. Both also breed, or have bred, in very small numbers. **White-shouldered Ibis** were only recorded in March and April from Baray and Veal Srongai IFBA, in the southeastern corner of the floodplain. They may also breed in the TSBR in low numbers.

*Colonial species for which the TSBR is a major breeding area*

The main colonies for the eight species in this group are at Prek Toal Core Area, with one or two other sites for Oriental Darters and Lesser Adjutants. Most birds are concentrated at the colonies during the breeding season, with non-breeders either scattered around the lake or concentrated at a few key feeding sites.

**Spot-billed Pelican** and **Oriental Darter** are found mostly in the inner floodplain, although a part of each population ranges more widely across the TSBR and elsewhere in Cambodia after breeding. In the southeastern corner of the floodplain Spot-billed Pelicans were found to be more common in the wet (non-breeding) season. Oriental Darters were present in quite large numbers at Boeung Tonle Chhmar in the dry season, which is the non-breeding period.

As with the preceding species **Asian Openbills** were not recorded in the outer floodplain during the driest period of the year. The number of Openbills at Boeung Tonle Chhmar increased progressively during the period of low water levels in the floodplain, followed by a dramatic increase in numbers there in June, just after the breeding season at Prek Toal ended. A part of the population stays within the floodplain the whole year round, but many birds disperse to other parts of Cambodia during the rainy season.

Very few records of **Black-headed Ibis** came from areas of the TSBR away from Prek Toal but small groups were present in the outer southeastern corner of the floodplain for brief periods during intermediate water levels (slightly damp ground to shallow water). It is believed that all Black-headed Ibis from Prek Toal spend the period of peak flooding outside the Tonle Sap floodplain, moving to Ang

Trapeang Thmor and perhaps also sites in the Mekong Delta.

In the breeding season a fairly large non-breeding population of **Painted Storks** ranges widely across the Tonle Sap floodplain. These non-breeders seem to feed in outer grasslands in the early dry season and move closer to the lake during the driest periods. Painted Storks reappear in the outer grasslands and agricultural areas in June and July. They were not recorded within the floodplain in the months of high water levels from August-October and presumably move elsewhere in Cambodia at that time.

There were no records of **Milky Stork** away from Prek Toal in 2009.

There were few records of **Greater Adjutant** away from Prek Toal, but notably there were sightings from Boeung Tonle Chhmar and Stung Sen Core Area at the height of the floods, confirming the presence of this rare species in the floodplain at all times of the year. Once again no large flocks were reported in May-July, something that used to be a regular occurrence.

At least a part of the **Lesser Adjutant** population stays within the floodplain the entire year. They generally occur at low densities and range widely but larger flocks were sometimes found making use of temporary feeding opportunities. Groups of >10 birds can also be found at Boeung Tonle Chhmar during the height of the dry season when many other wetlands have dried out.

## **2. Significance of sites**

The data suggest that **Boeung Tonle Chhmar** is an important feeding site in the dry season and early wet season for most large waterbirds that breed colonially in the TSBR; this was also suggested in the 2008 review but has been reinforced by the new data. The **Stung Sen Core Area** seemed to be visited by waterbirds more in the wet season than in the dry season. At present the data do not indicate any exceptional value of this site for large waterbirds compared to

other areas of the inner floodplain, with the possible exception of Spot-billed Pelicans. **Prek Toal** is of course the most important breeding site, but it also has significant numbers of Spot-billed Pelican, Oriental Darter and Lesser Adjutant staying in the area the whole year round. **Dey Roneath** continues to be of interest as a potential breeding colony (see below). **Veal Srongai** was seen to be important for large waterbirds that breed colonially in the TSBR and the nearby area of **Krous Kraom**, which was grassland but is increasingly dominated by intensive agriculture, continues to be much used by many species considered in this report. Furthermore the IFBAs, including the **Stoung-Chikraeng IFBA** group, contain a wide diversity of species, including Black-necked Stork and Woolly-necked Stork. If confirmed, the suspected occurrence of breeding White-shouldered Ibises near Baray IFBA would raise the significance of that site since they are listed as Critically Endangered by IUCN.

## **3. Large aggregations that may indicate presence of a breeding colony**

The 1,558 darters seen at **Dey Roneath** may have come from Prek Toal, but it is also possible that they were from breeding colonies nearby. A colony containing one hundred nests was found in Dey Roneath in 2007 and it may be that further colonies exist here. This area has never been properly surveyed to assess breeding of large waterbirds.

The large aggregations witnessed at **Boeung Tonle Chhmar** also deserve some follow up searches in the area during the breeding season to check for nesting birds, as the area (including Moat Khla) has had breeding colonies in the past.

## **4. Gaps in coverage**

The implementation of MIST in all Core Areas is a huge step forward. Together with the ongoing monitoring of the IFBAs this means that many of the known key sites in the north, east and southeast are fairly well covered. However, there is little coverage of the **south side of the floodplain, east of**

**Prek Toal.** The **southeastern corner** of the floodplain, although partly covered by Stung Sen Core Area, Prey Koh Conservation Area and Veal Srongai and Baray IFBAs still seems to hold as yet undisclosed secrets. Further searches in this area might locate new populations of White-shouldered Ibis and Greater Adjutant.

The data reviewed in this report are collected by rangers, not professional ornithologists. This group of species presents lower identification challenges than almost any other taxonomic group in Cambodia, but nonetheless errors are possible, and it is important that effort is spent on maintaining data quality. This should involve regular refresher courses and assessments of the identification skills and quality of data recording among the staff.

## **5. Threats**

There are worries that uncontrolled developments in the outer floodplain are destroying much important habitat and may also have negative impacts on the overall ecosystem as dams and irrigation channels obstruct water flow and fish migration and heavy use of chemicals may pollute the environment and kill many living organisms. The establishment of invasive *Mimosa pigra* is also often noted in areas with **dry season**

**rice cultivation** (pers. obs.) probably due to seed import through earth moving equipment such as excavators and tractors. The increased contact between people and wildlife is not to the benefit of wildlife and hunting pressure may be increasing as a result.

The use of **poisons** within the Boeung Tonle Chhmar Core Area has been recently reported to be extensive (Heng Sokrith 2009) and this practice is likely to occur elsewhere as well. Besides using poisoned fish bait to kill waterbirds and other wildlife the **collection of bird eggs** from nests was also reported here, but the species were not identified. Such practices are also likely to occur elsewhere. A lot of **illegal fishing** practices are routinely employed throughout the floodplain and even Prek Toal is not exempt from such destructive methods.

Incidents of hunting with guns, spears, nets or traps are not often reported but many species of waterbirds, including the ones treated in this report are still sold at markets in villages and towns around the lake (A. Yang, pers. comm.).

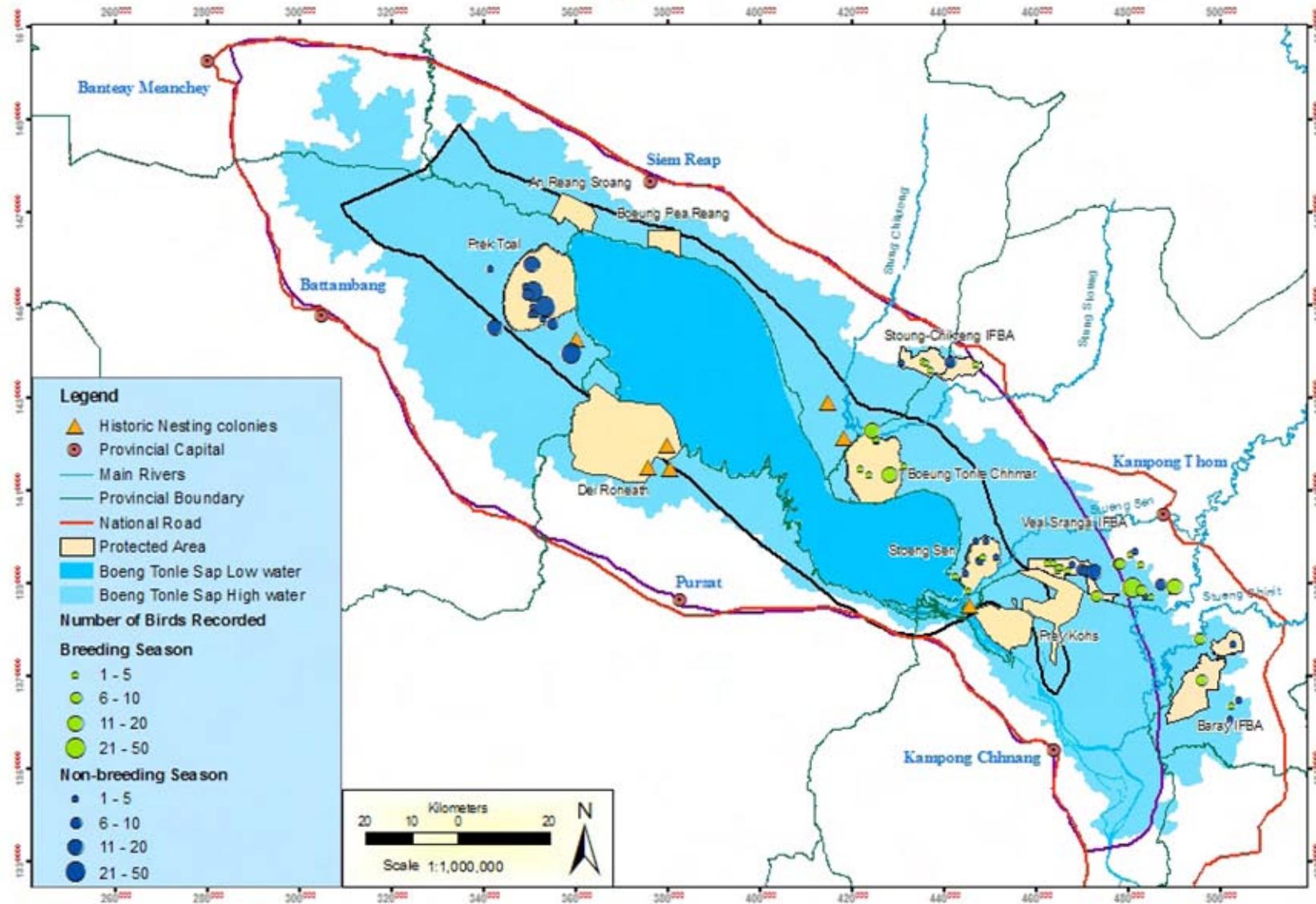
There is yet a lot of work to be done to get the extensive application of destructive practices under control.

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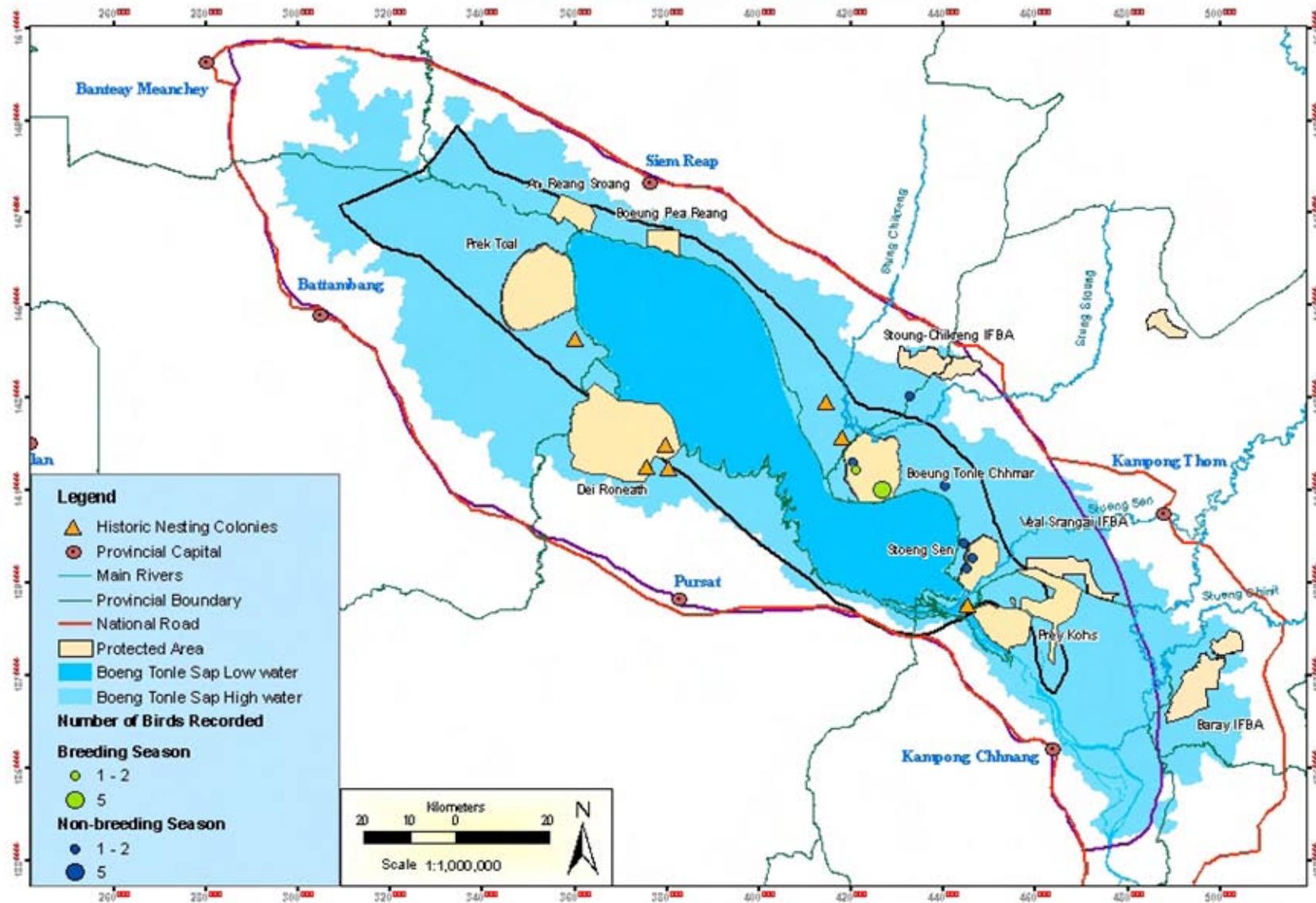
# MAP SECTION

# Lesser Adjutant Records 2009

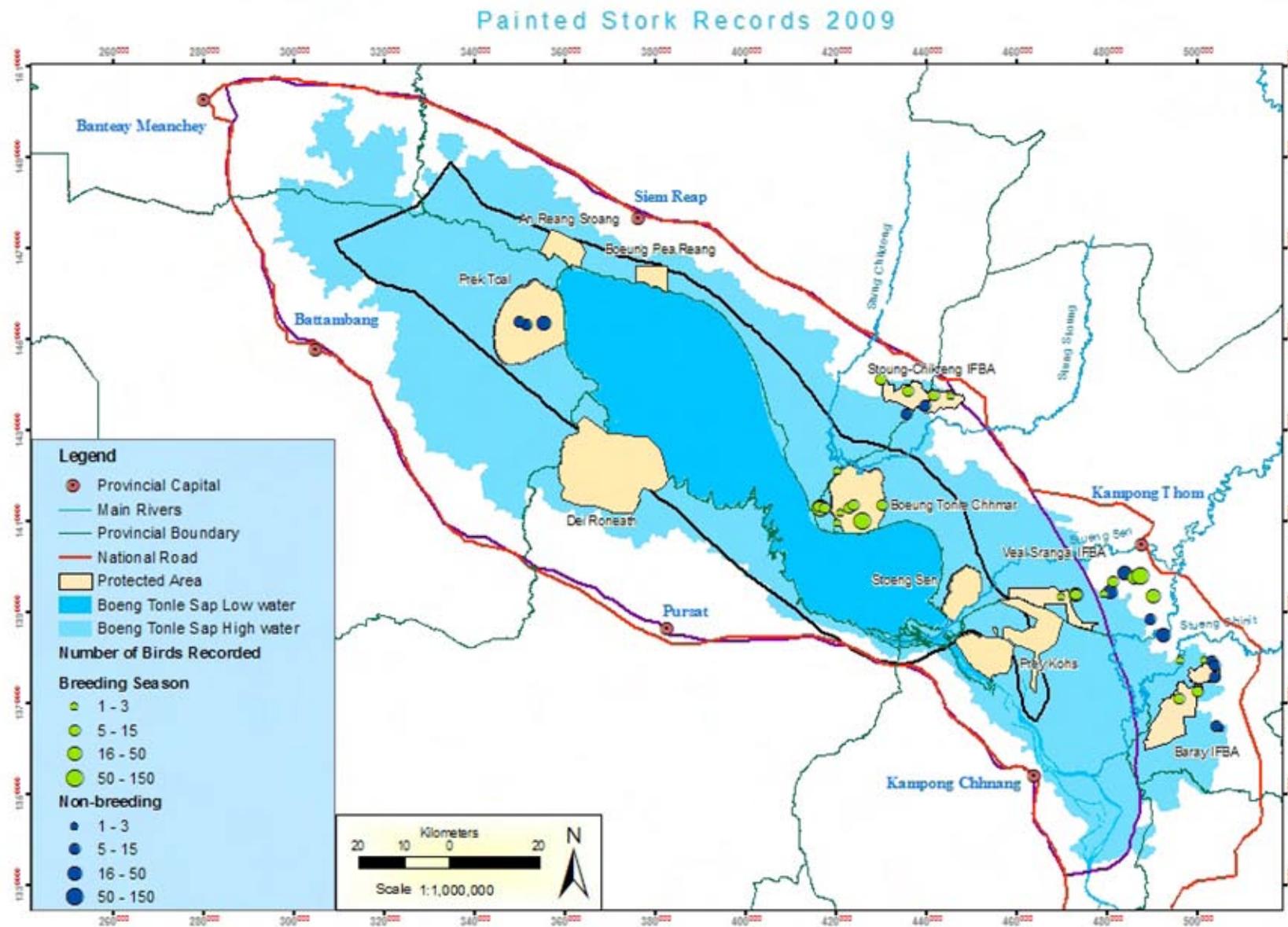


Map 1. Lesser Adjutant records in 2009

## Greater Adjutant Records 2009

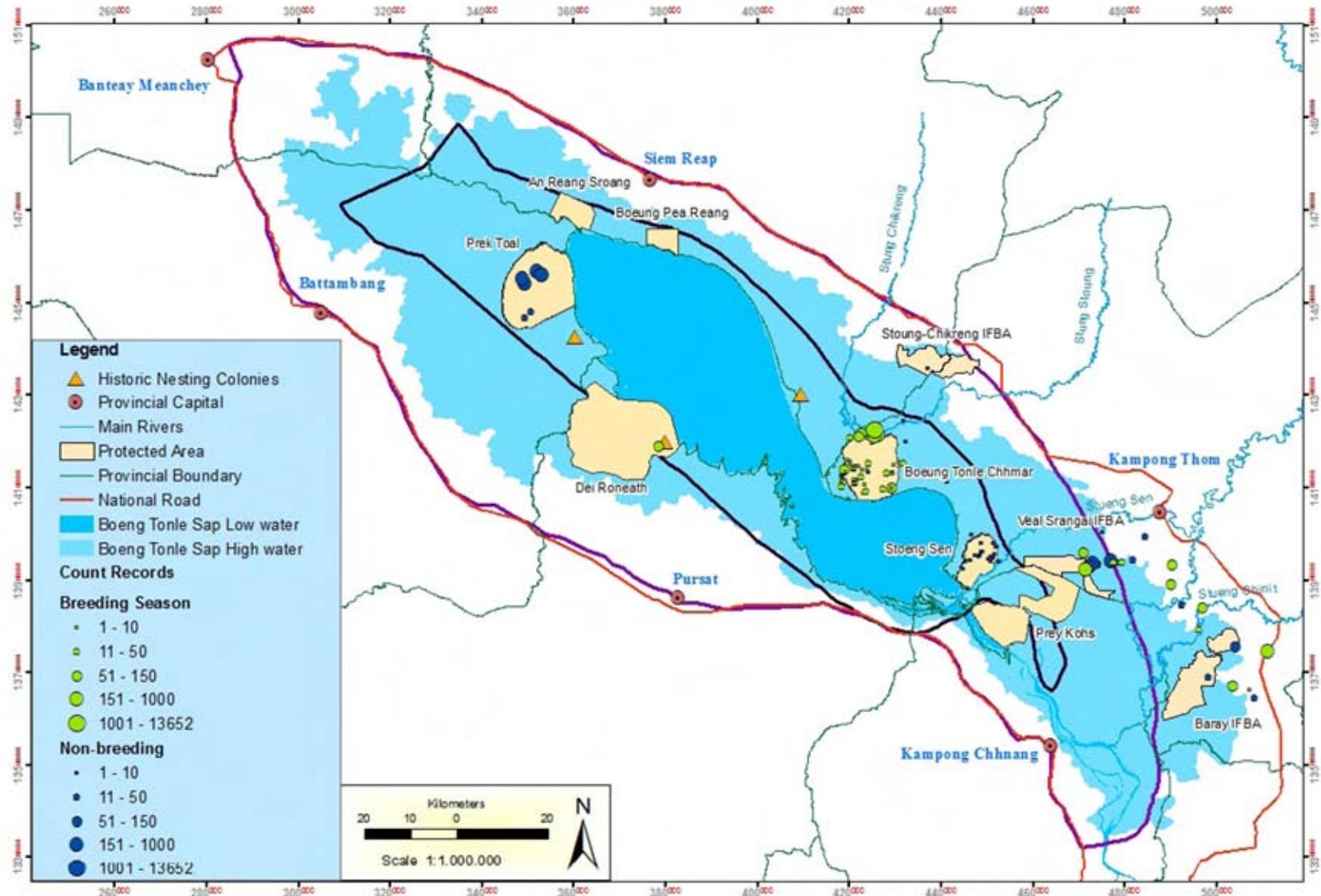


Map 2. Greater Adjutant records in 2009



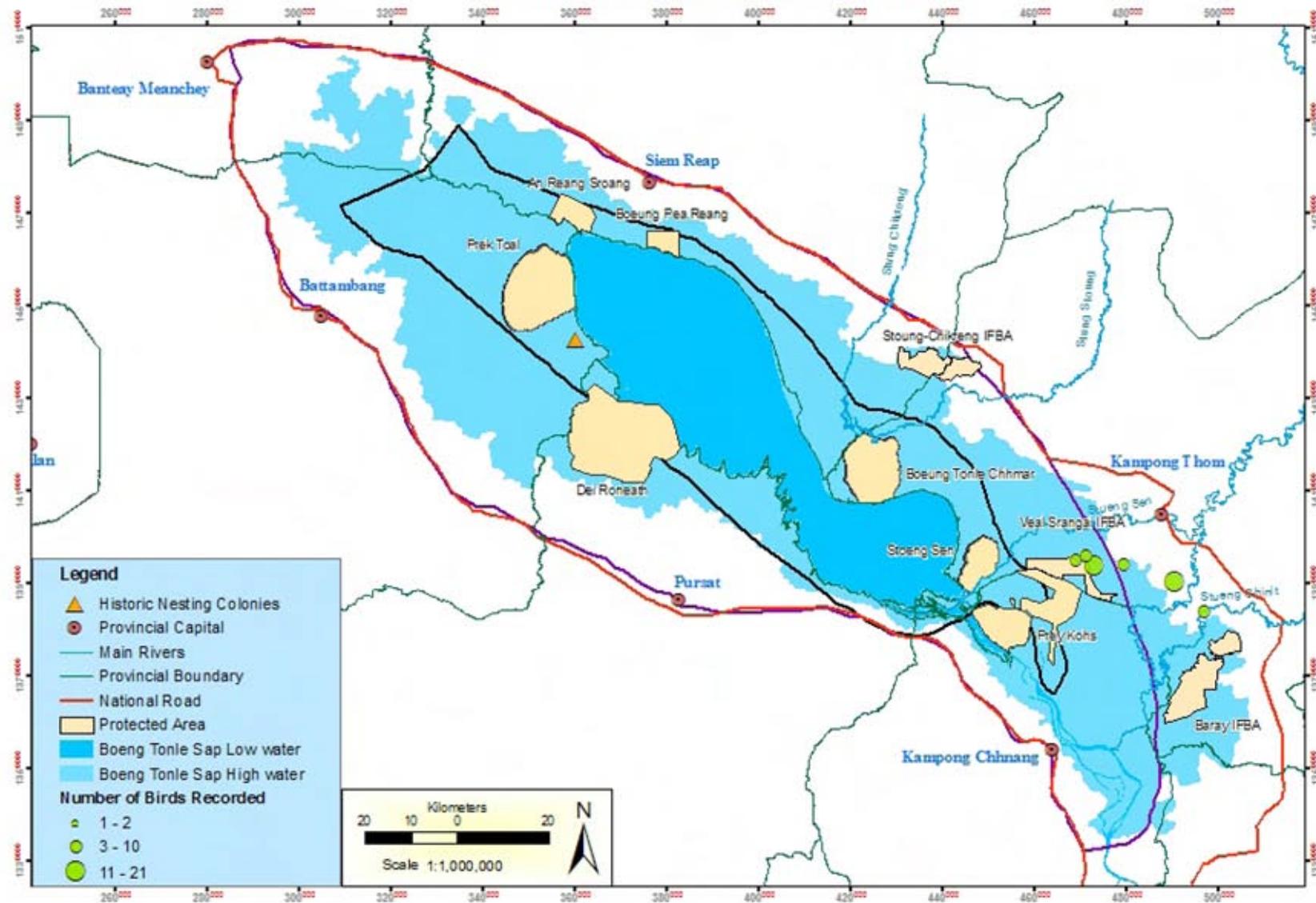
Map 3. Painted Stork records in 2009

## Asian Openbill Records 2009



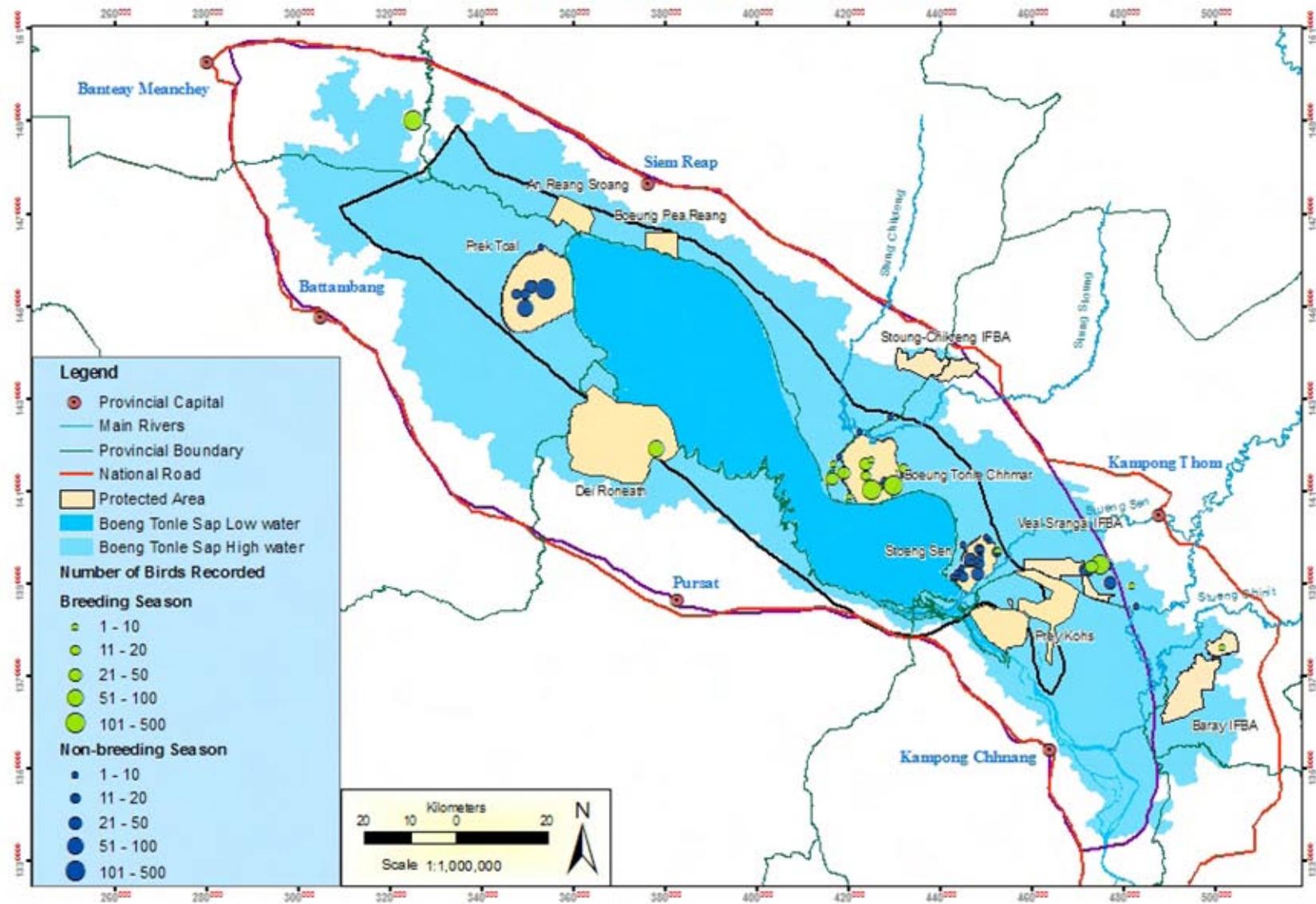
Map 4. Asian Openbill records in 2009

# Black-headed Ibis Records 2009



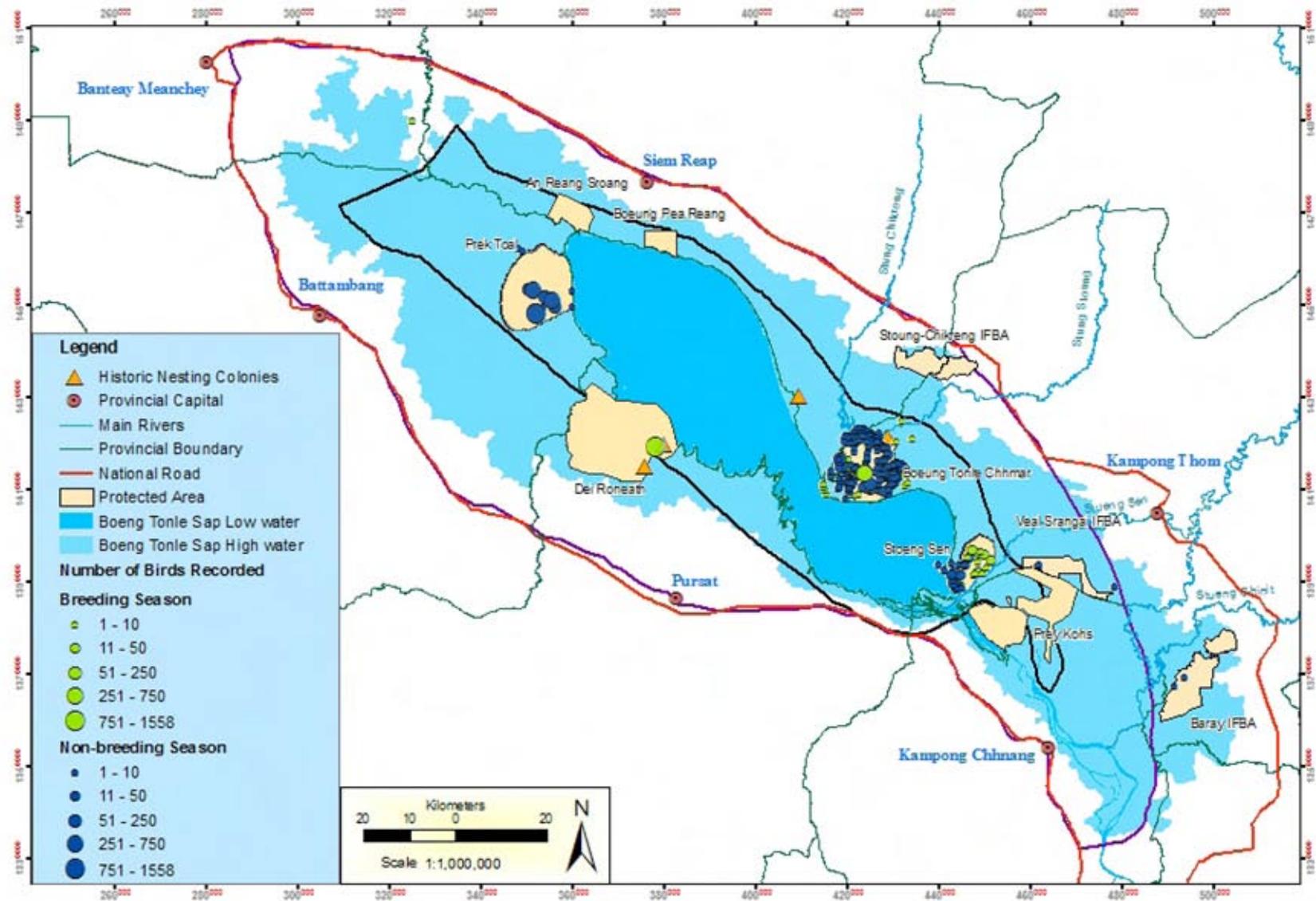
Map 5. Black-headed Ibis records in 2009

### Spot billed Pelican Records 2009



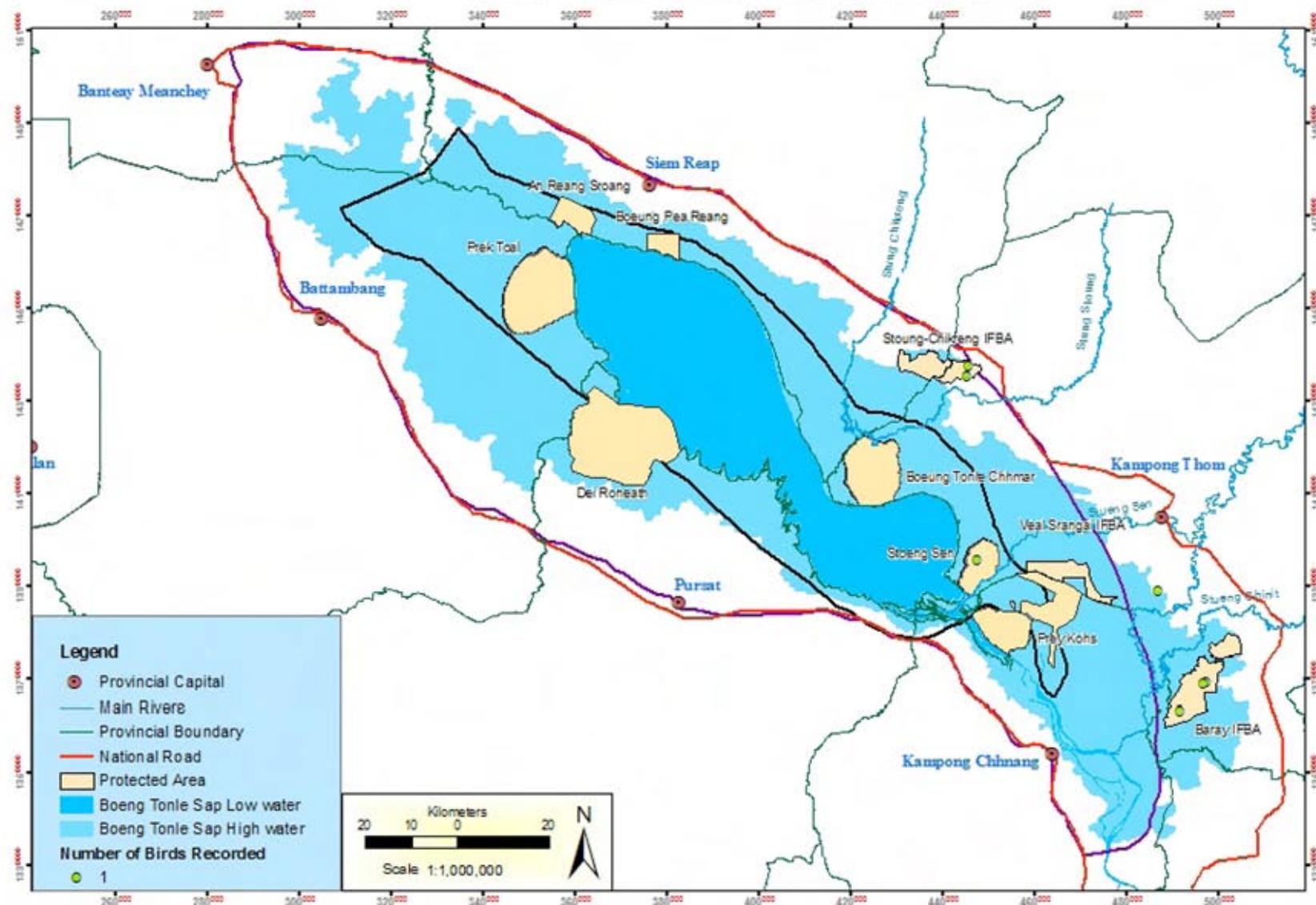
Map 6. Spot-billed Pelican records in 2009

## Oriental Darter Records 2009



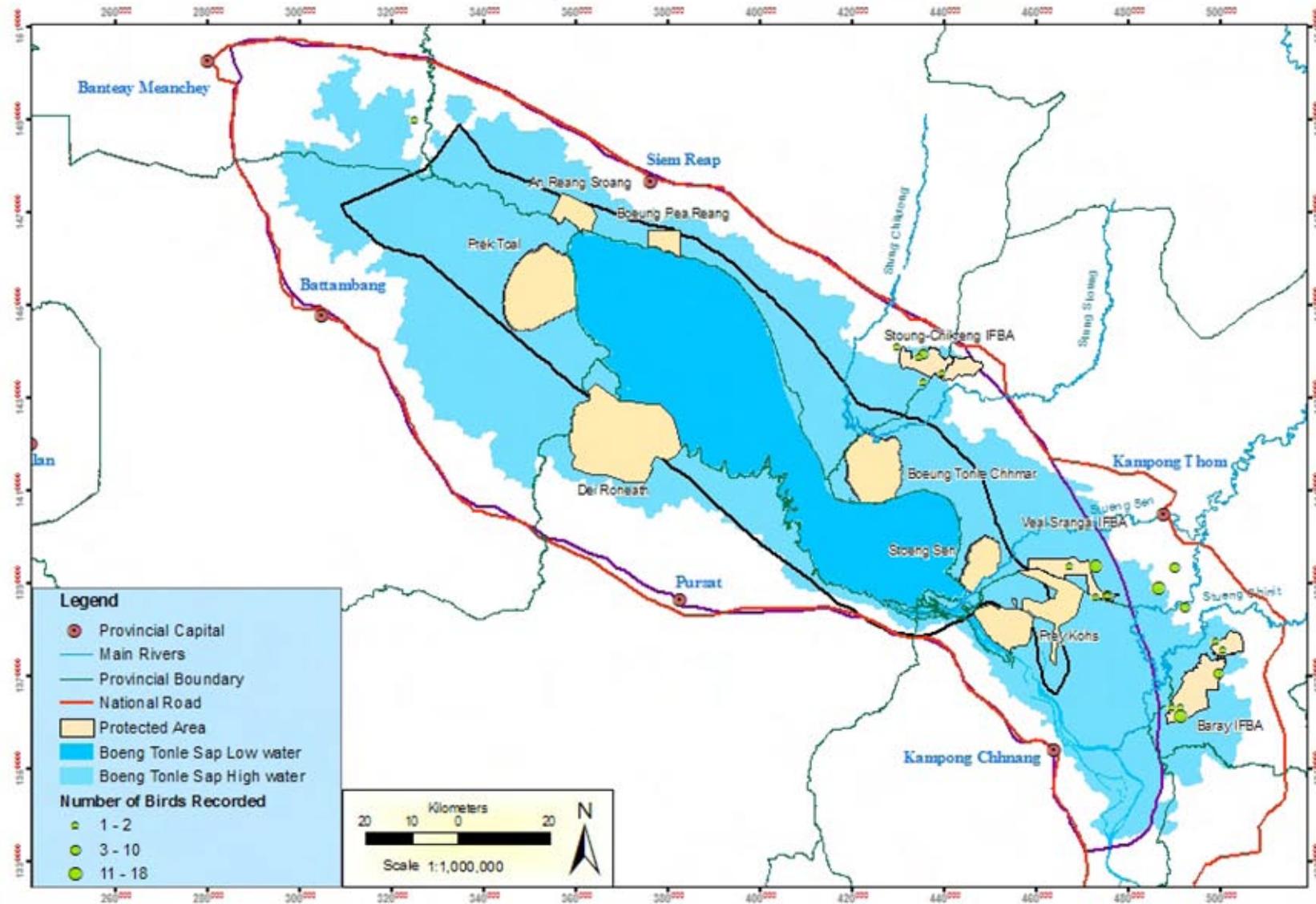
Map 7. Oriental Darter records in 2009

## Black-necked Stork Records 2009



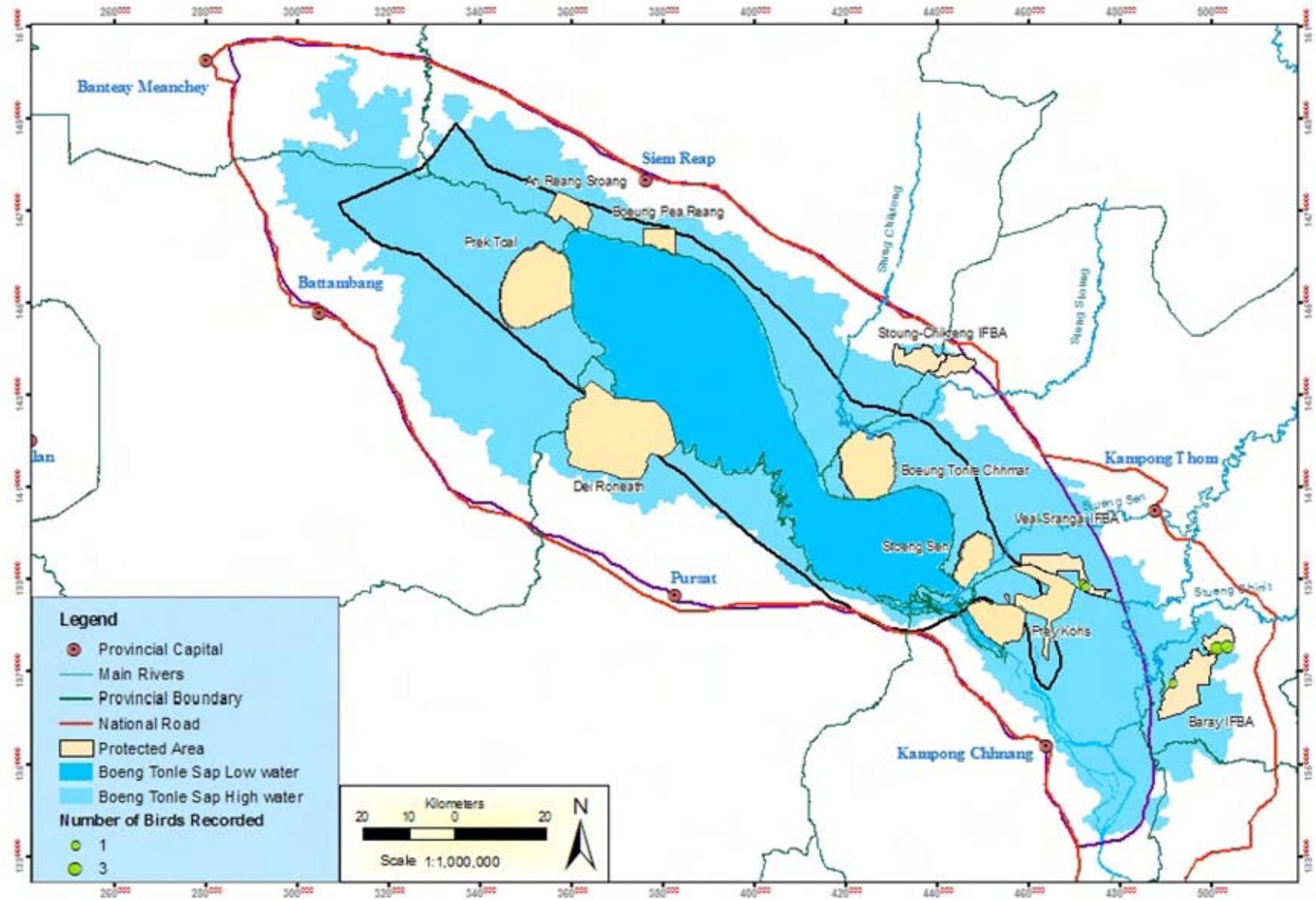
Map 8. Black-necked Stork records in 2009

### Woolly-necked Stork Records 2009



Map 9. Woolly-necked Stork records in 2009

# White-shouldered Ibis Records 2009



Map 10. White-shouldered Ibis records in 2009