Ten-year species action plan for the Giant Ibis *Thaumatibis gigantea* in Cambodia

2015-2025

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The present action plan represents the output of a workshop entitled 'Giant Ibis Consultancy workshop to produce a conservation action plan to effectively conserve Giant Ibis' conducted in Phnom Penh, Cambodia, on 30 November 2014 and two follow up workshops in January 2015 and July 2015. It was compiled by BirdLife International Cambodia Programme with technical input from the following organisations: Forestry Administration, Ministry of Environment, Wildlife Conservation Society, World Wide Fund for Nature, Conservation International, Angkor Centre for Conservation of Biodiversity, Conservation Leadership Programme, Sam Veasna Center, Center For Biodiversity Conservation- Royal University of Phnom Penh, Birds of Cambodia Education And Conservation and People Resources and Conservation Foundation.

Compilers

Robin Loveridge and Ty Srun

List of contributors

Dr. Keo Omaliss, Jonathan C. Eames, Bou Vorsak, Dr. Neil Furey, Sum Phearun, Simon Mahood, Alistair Mould, Dr. Thomas Gray, Rachel Crouthers, Toby Bakos, Oliver Gray-Read, Yav Net, Hong Lina, Thi Sothearen, Kry Masphal, Ian Burfield, Mike Crosby and Roger Safford, Prum Sovanna, Suy Senglim, Thou Veasna, Rours Vann, Thong Sokha, Chhin Sophea, Mem Mai, Luy Rathana, Sok Ko, Neab Samneang, Ken Bopreang.

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Abbreviations

ACCB Angkor Centre for Conservation of Biodiversity
BLI BirdLife International
BCEC Birds of Cambodia Education And Conservation
CBC Center for Biodioversity Conservation
CLP Conservation Leadership Programme
FA Forestry Administration
FFI Fauna and Flora International
MoE Ministry of Environment
NTFP Non Timber Forest Product
PF Protected Forest
PRCF People Resources and Conservation Foundation
SVC Sam Veasna Center
SMP Sansom Mlup Prey Cambodia
WCS Wildlife Conservation Society
WS Wildlife Sanctuary
WWF World Wide Fund For Nature

Executive Summary

Once relatively widespread in mainland South-east Asia, the Critically Endangered Giant Ibis (*Thaumatibis gigantea*) is now almost entirely restricted to the dry forests of northeastern Cambodia. The key threat to the species is forest loss, driven primarily by clearing of land in order to develop industrial agriculture (Economic Land Concessions), small scale agricultural encroachment and infrastructure developments. Based on the findings of this status review a minimum population estimate is 194 mature individuals.

The 10-year goal of this action plan is that by 2025, a stable or increasing population of Giant Ibis inhabits a network of well-protected sites. This will be achieved through three complimentary objectives: 1) Protect priority habitat of Giant Ibis at all key sites where the species occur. 2) Improve survival and breeding success through targeted species interventions. 3) Conduct research to inform conservation actions. This report details the priority actions required over the next 10 years to ensure the long-term survival of the species. Top priority actions are to establish Protected Forests around key Giant Ibis habitat, the identification of key Giant Ibis habitat for prioritisation within protected area management plans, the incorporation of Giant Ibis as a priority species within site level management plans and the establishment of a Giant Ibis Working Group to share information of Giant Ibis research and conservation measures.

សេចក្តីសង្ខេប

ត្រយ៉ងយក្សដែលជាបក្សីជិតផុតពូជ ធ្លាប់មានវត្តមាននៅទូទាំងភូមិភាគអាសុីអាគ្នេយ៍ដែលបច្ចុប្បន្ន ចំនួនរបស់វាស្ទើតែទាំងអស់មានវត្តមានតែនៅភាគឦសាននៃប្រទេសកម្ពុជាតែប៉ុននោះ។ កត្តាគម្រាមកំហែងសំខាន់ៗរួមមាន: ការបាត់បង់ទីជំរក ទាំងទីជុំរកពងកូន និងទីជំរករកចំណី, ការបរបាញ់, ការប្រមូលពងកូន ព្រមទាំងកត្តារំខានផ្សេងៗ។ ដោយផ្អែកលើការពិនិត្យផ្ទៀងផ្ទាត់ឡើងវិញនេះបានការព្យាករចំនួនតិចបំផុតនៃត្រយ៉ងយក្សពេញវ័យគឺមានប្រហែល194។

គោលដៅ១០ឆ្នាំនៃផែនការណ៍សកម្មភាពនេះគឺនៅឆ្នាំ២០២៥ ធ្វើអោយចំនួនត្រយ៉ងយក្សដែលមាននៅក្នុងតំបន់ការពារទាំងអស់មានស្ថេរភាព រឹក៏មានការកើនឡើង។ គោលដៅនេះនិងសម្រេចបានតាមរយៈកម្មវត្ថុបីគឺ: 1) ការការពារជម្រកអាទិភាពនៃត្រយ៉ងយក្សនៅទីតាំងសំខាន់ៗទាំងអស់ដែលត្រយ៉ងយក្សមានវត្តមាននៅទីនោះ 2) ធ្វើឱ្យប្រសើរឡើងនូវការរស់រានមានជីវិតនិង បង្កើនភាពជោគជ័យនៃការបន្តពូជតាមរយៈការចាត់វិធានការណ៍ការពារសត្វប្រភេទនេះ។ 3) ធ្វើការសិក្សាស្រាវជ្រាវបន្ថែមដើម្បីជូនដំណឹងដល់ផែនការណ៍អភិរក្ស។ ផែនការសកម្មភាពនេះលំអិតអំពីសកម្មភាពជាអាទិភាពដែលចាំបាច់សំរាប់អនុវត្តក្នុងរយៈពេល១០ឆ្នាំ ដើម្បីធានាការរស់រានមានជីវិតរបស់ត្រយ៉ងយក្សក្នុងរយៈពេលយូរ។ សកម្មភាពមួយចំនួនដែលជាអាទិភាពជាងគេដូចជា ការបង្កើតតំបន់ព្រៃការពារនៅតំបន់សំខាន់រាប់សត្វស្លាបសៀមប៉ាង កំណត់ទីជម្រកសំខាន់ៗរបស់ត្រយ៉ងយក្សសម្រាប់ជាអាទិភាពដាក់ក្នុងបញ្ចូលក្នុងផែនការគ្រប់គ្រងតំបន់ការពារ ការដាក់បញ្ចូលត្រយ៉ងយក្សជាប្រភេទអាទិនៅក្នុងផែនការគ្រប់គ្រងថ្នាក់តំបន់ ហើយនិងការបង្កើតក្រុមអភិរក្សត្រយ៉ងយក្ស ដើម្បីចែករំលែកពត៌មានសិក្សាស្រាវជ្រាវ និងវិធានការណ៍នៃការអភិរក្សត្រយ៉ងយក្ស។

1. Background

Taxonomy

Phylum: Chordata
Class: Aves
Order: Pelecaniformes
Family: *Threskiornithidae*
Genus: *Thaumatibis*
Species: *Thaumatibis gigantea* (Oustalet, 1877)

1.1 Policies

1.1.1 International conservation and legal status

The Giant Ibis is considered globally Critically Endangered because it has an extremely small population, which has undergone a rapid decline as a result of disturbance and lowland deforestation, and it is likely to continue to decline rapidly owing to on-going deforestation and human disturbance; it thus triggers IUCN Red List criteria A2cd+3cd+4cd and C2a(i). The species is not listed on CITES appendix I or II.

1.1.2 National policies and legislation

Giant Ibis was listed as Critically Endangered in the Sub-Decree (*Anukret*) by the Ministry of Agriculture, Forestry and Fisheries on the 25th January 2007 and under protection of 2002 forest law which promulgated by the Royal Decree (*Preah Reach Kram*) on 31 August 2002, Protected Area Law 2008 and Law on Environmental Protection and Natural Resource Management 1996 of the Ministry of Environment. Hunting of Giant Ibis was prohibited by declaration No. 359 dated August 01, 1994 issued by the Ministry of Agriculture, Forestry and Fisheries. The Giant Ibis is also nominated as the national bird of Cambodia by the Royal Decree on Designation of Animals and Plants as National Symbols of the Kingdom of Cambodia on 21 March 2005.

1.2 Conservation situation

1.2.1 Distribution, population size and trend

Thaumatibis gigantea is mostly confined to northern and eastern Cambodia, where it is probably still fairly widespread but extremely rare; with a few birds from the same population observed in extreme southern Laos. There is a recent record from Yok Don National Park, Vietnam: a single bird was seen in 2011. Its historical range spanned southern Vietnam and southeastern and peninsular Thailand, where it is now extinct. Available data suggest that it has a patchy distribution across Cambodia (BirdLife 2015, Figure 1).

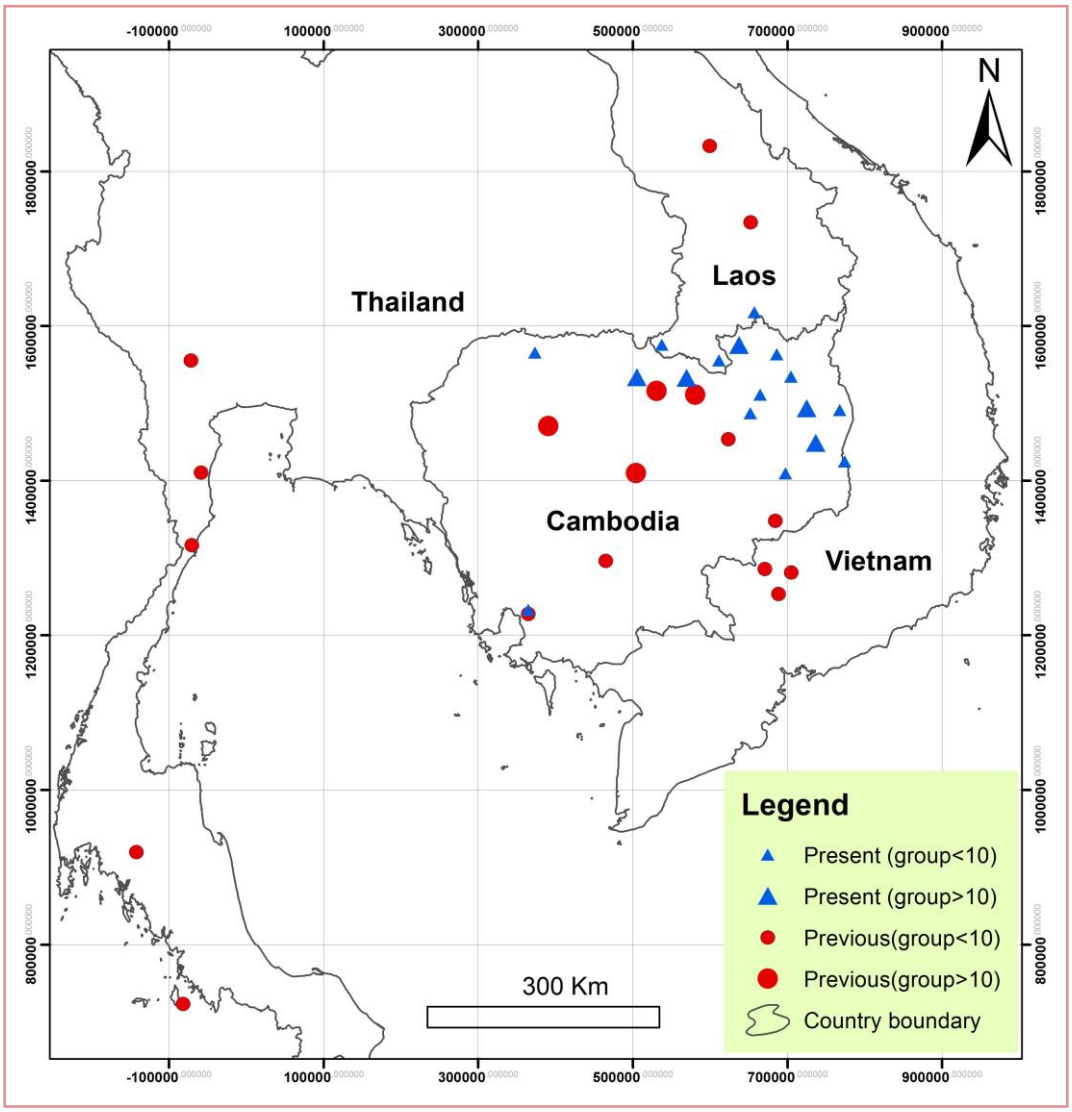

Figure 1: Map based on the range map produced by Keo (2008) and includes additional confirmed sightings from the literature - camera trap data from Koh Kong (Evans and Goes 2011), and two new sites presented at the Giant Ibis workshop 2014- camera trap photos from Sang Sahakum Rukhavoan Community Forest in Oddar Meanchy, and Sesan river.

Some areas of relatively high density still exist in the Northern Plains of Cambodia (Figure 2), including Preah Vihear Protected Forest and Kulen Promtep Wildlife Sanctuary, where 24 pairs were monitored in 2014 (WCS 2014). In Western Siem Pang IBA, recent estimates suggest a slight decline from approximately 40 pairs (H. Wright *in litt.* 2012) to estimates of between 42-62 individuals (Ty *et al*, 2014 unpublished data).

Other areas of significant populations include Mondulkiri Protected Forest and Lomphat Wildlife Sanctuary. Sum *et al*. (2011, 2013) estimated at least 10-15 pairs of Giant Ibis inhabit Lomphat Wildlife Sanctuary; while anecdotal camera-trap data (Gray *et al*. 2014) suggest a population of 50 individuals in Modulkiri Protected Forest (Gray personal communication). Although further survey effort is required at both these locations to gain a better understanding of these populations and distribution within the protected areas to prioritise conservation effort.

Other confirmed, although somewhat out of date sightings suggest populations of approximately five pairs may still exist in Seima Protection Forest, Phnom Prich Wildlife Sanctuary, Veun Sai-Siem Pang Conservation Area, Yok Don National Park in Vietnam and scattered across the

extreme South of Laos (BirdLife 2015). In addition Giant Ibises have recently been confirmed to at three further sites; these are Koh Kong (Evans and Goes 2011), Sang Sahakum Rukhavoan Community Forest in Oddar Meanchy and one site on the Sesan river near Stueng Treng (see range map below for exact locations). It is estimated that these sites each contain a minimum of one pair of Giant Ibis.

Based on these findings a minimum population estimate is 194 mature individuals. It is important to note that Figure 1 does not represent evidence of range expansion from the earlier range map produced by Keo (2008). Instead we document here previously unavailable data, which represent an increase in survey effort. In fact the range of the Giant Ibis has likely decreased between 2008 and 2015 as discussed below in relation to the large scale habitat conversion occurring across much of the species' range.

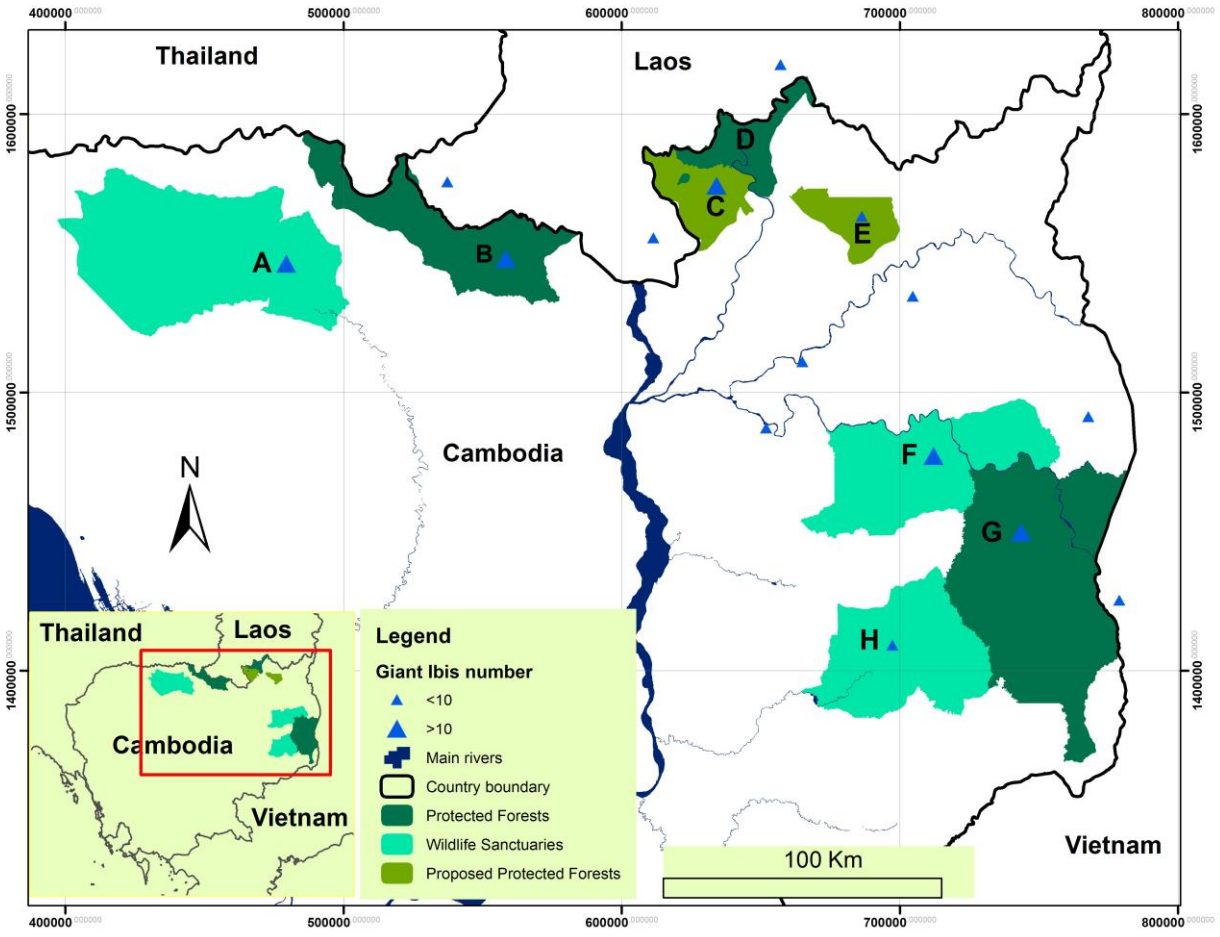

Figure 2. Map of priority protected sites in relation to present Giant Ibis populations of more than 10 individuals (large triangles) and less than 10 individuals (small triangles). Sites include Forestry Administration managed Protected Forests, Ministry of Environment managed Wildlife Sanctuaries and proposed new sites for protection. A: Kulen Promtep Wildlife Sanctuary, B: Preah Vihear Protected Forest, C: Siem Pang Proposed Protected Forest, D: Siem Pang Protected Forest, E: Veun Sai Proposed Protected Forest, F: Lomphat Wildlife Sanctuary, G: Mondulkiri Protected Forest, H: Phnom Prich Wildlife Sanctuary.

1.2.2 Habitat requirements

Singles, pairs or small parties occur in marshes, seasonal pools (*trapeangs*), wide rivers and grasslands in open, predominantly deciduous dipterocarp lowland forest (BirdLife 2015). The species seems to be dependent on soft mud around *trapaengs* for foraging during the dry season

(Wright *et al*. 2012), but sometimes it also feeds in deep water. Its diet comprises a variety of invertebrates, crustaceans, eels, frogs and reptiles. It frequently feeds in soft mud, but forages on all substrates at *trapaengs* (Wright *et al*. 2012). It nests in trees, with a preference for large *Dipterocarpus* species, generally more than 4 km from human habitation (Keo 2008b); in breeding season Giant Ibis use the very open dry dipterocarp forest near by the rivers (100-1000m) and in a medium distances from trapaengs (1000-2000m) (Ty, 2013).

1.3 Priority Issues

1.3.1 General overview

The species has declined as a result of wetland drainage for agriculture, deforestation and opportunistic hunting and egg collection. Clearance of very large areas of lowland dry forest, including parts of the Northern Plains (Preah Vihear Protected Forest, Kulen Promtep Wildlife Sanctuary) and other areas (Lomphat Wildlife Sanctuary, Western Siem Pang IBA) where the species occurs, for agro-industry including rubber, cassava, wood pulp and teak plantations, has recently emerged as the greatest threat to this species.

It relies on *trapeangs*, which in the past were perhaps maintained by the now much depleted megafauna (Wright *et al.* 2012). As a consequence there is concern that these priority foraging habitats will become overgrown and dry up, becoming unusable as a foraging resource.

Generally the human population is increasing within the range of this species mostly through immigration from other provinces in Cambodia. Subsequent expansion of agricultural land and increasing hunting pressure and disturbance at feeding sites is causing the loss of breeding habitat for the species (An Dara 2008). The species appears to be very sensitive to human disturbance (An Dara 2008), particularly during the dry season when both birds and humans are concentrated around available *trapeangs* rendering much apparently suitable habitat unusable.

There is a lack of precise information on population estimates for the different sites where Giant Ibis is known to occur and this impedes prioritisation of conservation effort. Furthermore there is a lack of evidence on species survivorship at different stages of the species' lifecycle. Nest monitoring activities by WCS in Preah Vihear shows that without protection measures nesting success of 66%, producing on average 1.25 chicks per nest (Keo 2009). However the localised population remains low, suggesting that a high percentage of these fledged chicks do not survive to maturity (Keo pers. comms.).

1.3.2 Key threats

Throughout this section "Current threat level" refers to the predicted severity of each threat between 2015 and 2025. Where threats are driven by more than one process "driver", each process has been described separately.

Threat levels were determined by combining rankings for scope of threat (percentage of total population affected by each threat) and severity (estimated impact on population). Scope and severity rankings are detailed below:
Scope: 1- all of population (>90% of population), 2- most (50-90%), 3- some (10-50%), 4- few (<10%).
Severity: 1. rapid (rapid deterioration causing >30% over 10 years or 3 generations), 2- moderate (10-30%), 3- slow (1-10%), 4- none (<1%).

1) Forest loss

Current threat level: Very High

A) Habitat conversion by large-scale Economic Land Concessions

Clearance of very large areas of lowland dry forest, including parts of the Northern Plains (Preah Vihear Protected Forest, Kulen Promtep Wildlife Sanctuary) and other areas (Lomphat Wildlife Sanctuary) where the species occurs, for agro-industry including rubber, cassava, wood pulp and teak plantations, has recently emerged as the greatest threat to this species; as agreed at a workshop held in Phnom Penh 2014. Indeed the majority of suitable Giant Ibis habitat within two protected areas previously identified to contain the species; Snoul Wildlife Sanctuary (Grey *et al*. 2014) and O Ya Dao Protected Forest (Barzen 2004) has now been converted to economic land concessions. This suggests that the species has become locally extirpated at these sites.

B) Habitat conversion by small-scale agricultural encroachment

In contrast to the habitat conversion described above, which refers to large-scale, industry led forest conversion into cash crop plantations, this threat, relates to small-scale agricultural expansion carried out by local communities for the purposes of subsistence agriculture and is often linked to the provision of infrastructure in the form of new roads.

C) Forest loss due to planned infrastructure and development initiatives

Development projects such as the planned construction of new roads through Siem Pang and Seima Protected Forest pose serious risk to Ibis habitat as they pave the way for high levels of migration into and settlement within sensitive habitat and increased levels of human disturbance. Future hydroelectric dam developments at the upper Mekong tributaries (Lower Se San 2 Dam and Lower Sre Pok 2 Dam) will lead to loss of some parts of Giant Ibis habitat along the Srepok and Sesan rivers, where a Giant Ibis population has recently been confirmed.

2) Human disturbance

Current threat level: High

A) Selective logging causing disturbance from and loss of suitable nesting trees

Giant Ibis prefer large dry dipterocarp tree species for nesting (Keo 2008). Indeed 90% of Giant Ibis nesting trees were found to be common deciduous dipterocarp tree species: "Trach" Dipterocarpus intricatus (Least Concern) (50% of nesting trees) – Royalty Class II[1], "Tbeng" Dipterocarpus obtusifolius (Least Concern) (40% of nesting trees) – Royalty Class II, "Korki" Hopea odorata (Vulnerable)- Royalty class I,
"Chheuteal" Dipterocarpus alatus (Endangered) – Royalty Class II and
"Phadiek" Anisoptera costata (Endangered) – Royalty class II.
In 2013 and 2014 BirdLife research team led by Ty Srun found that Giant Ibis used another tree species for nesting, "Phacek" Shorea obtuse (Least Concern) – Royalty class I.

1 Royalty class refers to the taxation category for commercial sale of different timber species; royalty class I is taxed more heavily and of higher economic value than class II.

Although Giant Ibis are not known to nest in luxury timber species, as commercial extraction depletes the remaining populations of luxury species, selective logging may increasingly target the above mentioned timber species which are still of significant commercial value. Therefore in heavily logged forests, commercial timber extraction may increasingly target trees also preferred by Giant Ibis for nesting.
Furthermore, Giant Ibis prefer to nest in tall straight trees, the tree type also preferentially selected for shaping into timber for house building. Therefore selective logging for subsistence housing construction by local communities is likely directly targeting and removing preferred Giant Ibis nesting trees. Logging of Giant Ibis nest trees during the nesting season may therefore increase breeding failure.
The lack of suitable nesting trees may also force Giant Ibis to nest in sub-optimal trees. In Siem Pang many of the large dipterocarp trees have been selectively logged, possibly causing a skew to the age classes of trees remaining in the landscape. In 2013 one Giant Ibis nest was observed on a small branch of a small tree. After a strong storm the nest was found beneath the tree. This anecdotal account suggests that selective logging may have an indirect effect on nesting success, although more detailed studies of the changing age classes of tree species is required to gain a better understanding of how selective logging is influencing forest structure.

B) **Exclusion from foraging resources**

With a rapidly increasing rural Cambodian population, the number of people using Giant Ibis habitat is increasing. This causes unintentional negative impacts on Giant Ibis including competition for food resources (fish and frogs) and associated disturbance and exclusion from *trapeangs* (An Dara 2008). The species appears to be very sensitive to human disturbance (An Dara 2008), particularly during the dry season when both birds and humans are concentrated around available waterholes rendering much apparently suitable habitat unusable by the birds.

C) **Anthropogenic burning**

The deciduous dipterocarp forest is burnt annually under an anthropogenic regime. However the frequency of burning has increased in recent years, causing an assumed reduction in ground biomass, which must impact negatively on food sources for Giant Ibis, such as frogs, reptiles and arthropods. A study of trapeangs that had versus had not been affected by fire found that mole crickets were three times as abundant at un-burnt pools (Keo 2008b). Burning history did not strongly affect the choice of feeding pool by Giant Ibises, although they used un-burnt pools more than burnt ones (Keo 2008b).

3) Loss of key habitat features (trapeangs)

Current threat level: High/Medium

Trapeangs are key foraging resources for Giant Ibis during the dry season (Keo 2008a, Wright et al. 2012). In the absence of wild ungulates such as Wild Water Buffalo *Bubalus arnee* and Asian Elephant *Elephas maximus*, the wallowing and grazing behaviours of domestic water buffalo *Bubalus bubalis* play a crucial role in maintaining the ecological integrity of *trapeangs* (Wright 2012). In particular the wallowing behaviour may play a key role in creating, saturated buddy substrate, the preferred foraging habitat of Giant Ibis (Keo 2008b). However, due to agricultural modernisation, buffalo ownership is decreasing (Bou and Yam 2014). The reduction of domestic buffalo from the site may cause sedimentation and vegetation to increase at *trapeangs* (Wright 2012). The effects of this can already been seen at some of the more remote *trapeangs* in Western Siem Pang, which are becoming

choked with dense vegetation, particularly *Sesbania* spp, a woody stemmed member of the pea family that forms tall (>3m) dense stands at *trapeangs*. Similar *trapeang* conditions can be seen at other sites in Cambodia such as Lomphat Wildlife Sanctuary, with the absence of large wallowing ungulates (both domestic and wild) considered being the main factor behind this deterioration. Increased sedimentation and vegetation at *trapeangs* has the potential to decrease the amount of foraging habitats available to Giant Ibis.

4) Natural predators (snakes, crows, monitor lizards and civets and other small carnivore species)

Current threat level: High/Medium

Nest predation by common palm civet *Paradoxurus hermaphroditus* and/or yellow-throated marten *Martes flavigula* on two occasions in 2004 suggest that loss of nestlings to mammalian carnivores might be a constraint on breeding success (Keo 2008b). In that study it was presumed that these mammals were the source of predation and bengal monitor *Varanus bengalensis* was not considered. However, in a recent study nearly 60% of nest failures were not attributable to any cause (Wright *et al*. 2013). Protection of Giant Ibis nests from predators resulted in the number of young fledged per nest being 50% higher for protected nests (Keo *et al.* 2009). This provides experimental evidence that nest predation is a threat.

2. Ongoing conservation strategies

Conservation Actions Underway

Currently, the international conservation NGOs are supporting FA and MoE to strengthen effective protected area management at priority protected sites where Giant Ibis are known to occur by providing both financial and technical support. BirdLife International is supporting FA working in Siem Pang and supporting MoE working in Lomphat Wildlife Sanctuary to protect and conserve wildlife in both sites, especially the Critically Endangered bird species. WCS is supporting FA to protect Preah Vihear Protected Forest and supporting MoE to protect Kulan Promtep Wildlife Sanctuary; WWF is working at Mondulkiri Protected Forest; ACCB work at Mekong Flood Plain and CI work at Vuen Sai.

Trial habitat restoration of key Giant Ibis foraging habitat (*trapeangs*) is currently being tested by WWF (Gray *et al.* 2015), WCS and BLI with the goal of improving suitable foraging habitat and prey availability for Giant Ibis during the dry season.

Targeted species conservation actions to date have included the use of predator exclusion devices known as baffles (on Giant Ibis nest trees to protect against predation of eggs from small carnivore species (Keo 2008b). In Preah Vihear Protected Forest the use of nest baffles has been shown to increase survival success (Table 1). However there is concern that baffles may act as a clear visual cue to attract potential hunters to nest trees. Therefore the overall success of this intervention may depend on it being implemented in combination with a strong community engagement programme to deter hunting behaviour.

Figure 3. Predator-exclusion device (baffle) used for protecting Giant Ibis nests from civets and martens, reproduced from Keo 2008a.

Table 1: Success rate of the protected and unprotected nests in PVPF (Keo, 2009)

	Number of nests	Number of chicks fledged	Chicks per nest	Success	Daily survival Mayfield estimate	Estimated survival over nestling period
Protected	24	45	1.875	93.75	99.85 ± 0.15	90.00 ± 9.48
Unprotected	28	35	1.250	67.31	99.30 ± 0.21	61.30 ± 9.04

An alternative targeted nest protection method that has been used on other threatened bird species in Cambodia is the use of nest guardians; local community members given conditional payments to protect nests. In Preah Vihear Protected Forest and Kulen Promtep Wildlife Sanctuary a study comparing survival during the nesting period for nests with and without nest guardians of Lesser Adjutant *Leptoptilos javanicus*, and Sarus Crane *Grus antigone* showed that nests with guardians had significantly higher success (Clements *et al.* 2013)- Giant Ibis nests already being protected by the use of baffles. Nests were located by local people, often well-known hunters, hired specifically to reduce hunting pressure and for their knowledge of species' ecology. Local people received a reward of US $5 for reporting a nesting site. For all species except Giant Ibises a permanent protection team of two people was established for each nest, or colony of adjutants. Each community member was paid $1 per day (prior to 2008, increasing to $2.5 after 2008) and a bonus $1 per day if the chicks fledged successfully.

The effectiveness of nest guardians appears to differ from site to site. In a study of the breeding success of the White-shouldered Ibis *Pseudibis davisoni* in Western Siem Pang, Kulen Promtep Wildlife Sanctuary, Mekong Flooded Forest and Lomphat Wildlife Sanctuary, Wright *et al*. (2013) found that overall the use of nest guardians had no effect of breeding success. We infer

that the effectiveness of nest guardian schemes may also depend on developing positive local attitudes towards conservation.

WWF Siphandone, Stung Treng, Kratie currently use nest guardians on the White-Shouldered Ibis and hope to apply this approach to Giant Ibis nests. WCS and WWF plan to continue to use nest baffles and nest guardians in connection with wider sustainable habitat management and law enforcement initiatives. While BirdLife International has currently stopped the use of nest guardians and baffles due to concern that these targeted protection measures may cause additional disturbance at breeding sites and have a negative effect on breeding success. Instead BirdLife International is increasing the level of nest monitoring by trained members of the field monitoring team.

Furthermore WCS in partnership with SMP is pursuing a livelihoods development programme through the Ibis Rice initiative at Preah Vihear aimed at supporting improved livelihoods among local communities in exchange for land titling agreements and increased commitment to sustainable and non-environmentally damaging agricultural practices. WCS is also working with SVC to implement Giant Ibis focused ecotourism at KPWS. Local communities receive a financial benefit linked to successful sightings of the ibis by birdwatchers.

Giant Ibis Transport has also taken on the role of Species Champion, agreeing to provide funding over three years for conservation work undertaken by BirdLife International. Giant Ibis Transport has supported the production of a documentary (Land Of The Giants) on the Giant Ibis, available in both English and Khmer, to support awareness raising efforts on the species.

3. Framework for action

3.1 Scope of planning

This action plan represents the output of a workshop entitled ‘Giant Ibis Consultancy workshop to produce a conservation action plan to effectively conserve Giant Ibis’ conducted in Phnom Penh, Cambodia, on 30 November 2014. A list of attendees is contained in Annex 2.

3.2 Matrix

Aim
By 2025, a stable or increasing population of Giant Ibis inhabits a network of well-protected sites.

Objectives

1. Protect priority habitat of Giant Ibis at all key sites where the species occur
2. Improve survival and breeding success through targeted species interventions
3. Conduct research to inform conservation actions.

Outcomes

1. All priority sites within the range of Giant Ibis are managed appropriately.
2. Targeted species interventions result in improved breeding success and survival.
3. Conservation research and monitoring is used to inform species management.

Actions and Budget
All costs in US$. Indicative budget does not account for rate of inflation.

Objective 1. To protect breeding and foraging habitats of Giant Ibis at all key sites where the species occur.						
Action	**Priority**	**Timescale**	**Organisations**	**Annual cost**	**Years**	**Total**
1.1. Establish new Protected Forests covering core deciduous dipterocarp habitat in Western Siem Pang, Vuen Sai, Mekong Bird nest Protection site near Kratie	Very High	2015, 2017, 2019	FA, BLI, CI, WWF	100,000	3	300,000
1.2. Implementing and supporting effective protected area management including law enforcement and targeted patrolling of key Giant Ibis habitat	High	Ongoing	FA, MoE, WWF, WCS, BLI, CI	800,000	10	8,000,000
1.3. Support sustainable development initiatives to enhance the economic value of conservation for local communities surrounding core Giant Ibis habitat and reduce the need for encroachment e.g. Wildlife Friendly rice, ecotourism	High	Ongoing	FA, MoE, WCS, WWF, BLI,	50,000	3	150,000
1.4. Support environmental impact assessment process for planned development initiatives to consider and minimise impact on core Giant Ibis habitat- locating new road developments outside of protected sites and minimising the impact of planned	High	Ongoing	FA, MoE, WCS, WWF, BLI	50,000	5	250,000

dam development projects on Giant Ibis habitat						
1.5. Support efforts to engage the private sector in socially and environmentally responsible development projects, preventing ELCs from being located within protected sites and reducing, mitigating and where necessary offsetting the biodiversity impact of projects. Particularly Lomphat WS and Seima PF e.g. mitigate the impact from Hoang Anh Gia Lai Group	High	As the need arises	All, NGO network meetings as needs arise	50,000	3	150,000
1.6. Piloting of habitat restoration techniques for priority foraging habitat- (*trapeangs*)	High	2015-2020	BLI, WCS, WWF, FA,	10,000	5	50,000
1.7. Supporting community co-management of priority habitats (*trapeangs*) and advocacy to reduce community disturbance and poisoning of these sites	Medium	2015-2020	FA, MoE,	20,000	10	200,000
1.8. Secure funding for implementing conservation activities	Medium	Ongoing	All	5	1	5,000
Total cost						**9,955,000**

Objective 2. Improve survival and breeding success through targeted species interventions						
Action	**Priority**	**Timescale**	**Organisations**	**Annual cost**	**Years**	**Total**
2.1. Incorporate Giant Ibis as a priority species, setting conservation targets and activities within site level management plans for protected sites in SP, PVPF, KPWS, MPF, LWS)	High	2015-2016	FA, MoE, BLI, WCS, WWF, ACCB	5,000	1	5,000
2.2. Locate Giant Ibis nests and provide targeted protection e.g. baffles/ nest guardians/ targeted patrols	High	Ongoing	FA, MoE, WCS, WWF, BLI	40,000	10,000	400,000
2.3. Consolidate awareness raising materials (including Giant Ibis film, *trapeang* poisoning posters etc.) and conduct education and awareness raising programme in villages surrounding key Giant Ibis populations to effect positive attitude change	Medium	Ongoing	All partners	10,000	10	100,000
Total cost						**505,000**

Objective 3. Conduct research to inform conservation actions						
Action	**Priority**	**Timescale**	**Organisations**	**Annual cost**	**Years**	**Total**
3.1. Establish Giant Ibis Working Group to share information on Giant Ibis research	High	2015	BLI	2,000	10	20,000
3.2. Develop unified census method that is possible to implement at all priority sites at a minimum cost and with appropriate national technical expertise	High	2015-2016	BLI	10,000	2	20,000
3.3. Conduct census in priority sites – each site to follow appropriate methodologies to suit their needs and resource availability until a census method is endorsed by all partners	High	2017, 2020, 2023	All partners	50,000	3	150,000
3.4. Within priority sites identify and map key areas for Giant Ibis conservation (e.g. nest sites , *trapeangs*, earthworm mounds) to inform the development of site management plans	High	2015-2017	All partners	60,000	3	180,000
3.5. Establish regular monitoring of key foraging sites, nesting trees, changes in forest structure and condition within priority protected sites	Medium	2017 onwards	All partners	10,000	9	90,000
3.6. Investigate under surveyed sites of potentially high Giant	High/ Medium	2016 onwards	BLI, WWF, ACCB, WCS	60,000	1	60,000

Ibis populations – Lomphat WS, Mondulkiri PF, Mekong Bird Nest Protection site near Kratie						
3.7. Assess effectiveness of targeted conservation actions (e.g. breeding success with/without baffles)	Medium	2015 onwards	All partners	5,000	3	15,000
3.8. Update data on species distribution, trend, etc. to update BirdLife Data Zone factsheet on Giant Ibis	Medium	2015, 2018, 2021, 2024	BLI	1000		4000
3.9. Purchase satellite transmitters for opportunistic studies of Giant Ibis, to understand ranging behaviour	Medium	2018	WCS, WWF, BLI, ACCB	10,000	1	10,000
3.10. Research species survival at different stages of lifecycle - particularly monitor juvenile mortality and causes.	Medium	2019, 2020	All partners	10,000	3	30,000
3.11. Investigate intensification of burning regimes	Low	2020,2021	WCS, BLI, WWF	10,000	1	10,000
Total cost						**589,000**

4. Law and regulation drafting schedule

Giant Ibis is protected by Cambodia law and was nominated as national symbol bird of Cambodia by Royal Decree. Therefore there is no need for additional laws to be passed for this species.

5. Budget summary and implementation plan

5.1 Budget summary

Action	Mean annual cost	Years	Total
Objective 1. To protect breeding and foraging habitats of Giant Ibis at all key sites where the species occur	**995,500**	10	**9,955,000**
Objective 2. Improve survival and breeding success through targeted species interventions	**50,500**	10	**505,000**
Objective 3. Conduct the research to inform conservation actions	**58,900**	10	**589,000**
Total	**1,104,900**		**11,049,000**

*** Budget in US$**

5.2 Implementation plan

Action\Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Objective 1											
1.1											
1.2											
1.3											
1.4											
1.5											
1.6											
1.7											
1.8											
Objective 2											
2.1											
2.2											
2.3											
Objective 3											
3.1											
3.2											
3.3											
3.4											
3.5											
3.6											
3.7											
3.8											
3.9											
3.10											
3.11											

6. Monitoring and evaluation

The delivery of the Giant Ibis National Action Plan will be monitored and evaluated by the Ibis Working Group (see annex 5). At the time of writing this group is in the process of establishment. It will be co-chaired by senior representatives from the Forestry Administration and Ministry of Environment, with two group coordinators from BirdLife International Cambodia Programme to oversee day to day delivery of action plan activities and organise two workshops per year to review progress. The group will also include government representatives from each protected site and NGO counterparts.

The impact of Giant Ibis conservation measures is monitored through both species monitoring and habitat monitoring approaches:

6.1 Species monitoring

Two species monitoring approaches are undertaken to assess population and individual survival:
1) The direct monitoring of nesting success of breeding pairs
2) Population surveys of priority sub populations during the dry season (Jan-March). A detailed protocol for this survey methodology is available from BirdLife Cambodia Programme (contact Srun@birdlifecambodia.org)

6.2 Forest cover change

Changes in the extent of forest cover are derived from remotely sensed satellite data and reviewed periodically every three years for the different priority protected sites.

7. Conclusion

The Giant Ibis is Cambodia's national bird. Yet the species is Critically Endangered and faces a high risk of extinction. Its continued survival depends on greater commitment of key protected sites to implement targeted conservation measures for the species. This action plan aims to form the foundation for a Giant Ibis Working Group, a core group of government and civil society partners that will identify and drive forward priority actions for the species.

Important threats to Giant Ibis habitat are the large-scale land clearance of forest for plantation farming known as Economic Land Concessions, small-scale agricultural encroachment and forest loss due to infrastructure developments such as new road construction projects. In addition there are still big gaps in our knowledge of the species' distribution across Cambodia, the priority locations for targeted conservation within protected sites, and the species' ranging behaviour.

Priority actions for site conservation of Giant Ibis include the establishment of new protected sites around key areas of Giant Ibis habitat, naming Giant Ibis as a priority species for conservation within site management plans and agreeing conservation actions at a site level, improved law enforcement and sustainable management of forest resources and sustainable development support to local communities to reduce over-exploitation of Ibis habitat. In addition greater effort is required to locate Giant Ibis nests in order to implement targeted nest protection measures, coupled with community awareness raising to improve the flagship status of the species. Finally on-going monitoring and research is required to inform conservation interventions and better understand survival challenges at different stages of the species' lifecycle.

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ANNEX 1: Description of low priority threats to Giant Ibis

5) Hunting of adult Giant Ibis, chicks and eggs

Current threat level: Low

A thorough assessment of the severity of this threat is still lacking. However consultation with key site managers at all protected sites where Giant Ibis are known to occur has provided no documented cases of Giant Ibis hunting. Therefore hunting is not considered to be as widespread a threat as had previously been assumed. Any hunting that may occur is assumed to be undertaken opportunistically and linked to other forest use strategies, such as NTFP collection.

6) Climate Change

Current threat level: Low

A prolonged drought in the 2009-2010 dry seasons appeared to dramatically lower the breeding success of Giant Ibis, by approximately 50%; although this event is not attributable to climate change, climate change may pose a long-term threat to the persistence of this species (H. Rainey *in litt.* 2012).

7) Poisoning

Current threat level: Low

A potential threat is also posed by human intervention at *trapeangs*, poisoning water sources either deliberately or unintentionally. This has the potential to cause knock on effects on species that feed at these food sources. A Giant Ibis was found poisoned at Trapeang Svay Toych on 11 January 2009 (BirdLife International Cambodia Programme 2012)

8) Stochastic effects (heavy rain and wind causing nest destruction)

Current threat level: Unknown

In 2013 one chick fell from the nest at Siem Pang forest. This was likely caused by strong wind as the nest was built on an unsuitably small branch and easily shaken by the wind.

ANNEX 2: List of attendees at Giant Ibis workshop 30 November 2014, Phnom Penh

No.	Name	Organisation	Position	Other
1	Jonathan Eames	BL	Senior Technical Advisor	
2	Bou Vorsak	BL	Country Programme Manager	
3	Robin Loveridge	BL	Technical Advisor	
4	Kry Masphal	BL/FA	Siem Pang Protected Forest Manager	
5	Sum Phearun	BL	National Vulture Coordinator	
6	Simon Mahood	WCS	Tonle Sap Technical Advisor	
7	Thomas Gray	WWF		
8	Toby Bakos	ACCB	Programme Manager	
9	Oliver Gray-Read	ACCB	Vulture Coordinator	
10	Rours Vann	WCS	Research Team Leader at KPWS	
11	Thong Sokha	WCS	Project Coordinator	
12	Suy Senglim	BL/BCEC		
13	Chhin Sophea	CBC/FFI	Researcher	
14	Neil Furey	CBC/FFI	Research Associate	
15	Prum Sovanna	WWF/FA		
16	Neab Samneang	MoE		
17	Ken Bopreang	MoE		
18	Thou Veasna	PRCF	Project Officer	
19	Sok Ko	WWF/FA		
20	Yav Net	BL	Project Officer	
21	Ty Srun	BL	Project Officer	
22	Hon Lina	Grandis Timber	Coordinator	
23	Thi Sotearen	CBC/FFI	Project Officer	
24	Mem Mai	BL	Senior Monitoring Ranger	
25	Luy Rathana	FA		

ANNEX 3: Updated population estimate

Location	Previous BirdLife datazone estimate no. of pairs	Source	2014 estimates	Source	2014 mature inds
Preah Vihear and Kulen Promtep Wildlife Sanctuary	40	T. Evans in litt. 2012	24 nests	WCS nest data 2014	48
Siem Pang	40	H. Wright in litt. 2012	42-62	Ty 2014	35
Lomphat Wildlife Sanctuary	5	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	10-15 pairs	Sum (2013)	25
Koh Kong			1	(Evans and Goes 2011)	2
Sesan			1 pair or 3 birds	Oliver Gray-Read expert opinion based on anecdotal sightings	2
Oddar Meanchy - Sang Sahakum Rukhavoan community forest			1 pair	Peter Brackles camera trap annecdotal evidence	2
Seima Protection Forest	5	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	5 pairs	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	10
Mondulkiri Protected Forest	5	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	50 individuals	Tom Grey's expert opinion based on anecdotal camera trap data	30
Phnom Prich Wildlife Sanctuary	5	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	5 pairs	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	10
Snoul Wildlife Sanctuary			0	Previous sightings by Tan Setha 2002 in litt. (taken from Grey et al. 2014)	0
O Ya Dao Protected Forest			0	Previous sightings by Barzen 2004 (taken from Grey et al. 2014)	0
Veunsai Protected Forest	5	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	5 pairs	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	10
Tonle Sap Lake		T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	5 pairs	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	0
Yok Don National Park - Vietnam	5	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	5 pairs	T. Evans, H. Rainey, R. Vann and H. Wright in litt. 2012	10
extreme south of Laos	5		5 pairs	BirdLife 2015	10
Total number of adult pairs	**115**	BirdLife 2015			
Total Number of mature individuals				Updated estimate	**194**
Total number of individuals	**345**	BirdLife 2015			

ANNEX 4: Giant Ibis educational resources

Michaud, A. (2015) *Land of the Giants.*
Available: https://www.youtube.com/watch?v=7lPsunz-cPI&feature=youtu.be

BirdLife International Cambodia Programme. (2014). *Buffalo Friend.*
Available: https://www.youtube.com/watch?v=w_p1smzZFG4

ANNEX 5: Ibis working group draft mission and objectives

Mission
To promote the long-term conservation of both Giant Ibis and White-shouldered Ibis and their habitats in Cambodia by coordinating conservation activities between international and national organisations.

Objectives:
1) Oversee the development, implementation and review of Ibis species action plans
2) Improve the coordination, capacity and quality of conservation interventions at all sites
3) Coordinate national species censuses
4) Develop mechanisms for the sustainable financing and coordination of Ibis conservation

ANNEX 6: List of attendees at Giant Ibis consultation meeting 29 July 2015

No.	Name	Position	Organization
1	Keo Omaliss	Director	Department of Wildlife and biodiversity, FA
2	SengRathea	Deputy Director	Biodiversity Department, MoE
3	Jonathan Eames	Senior Technical Advisor	BLI
4	Bou Vorsak	Country Programme Manager	BLI
5	Robin Loveridge	Technical Advisor	BLI
6	Kry Masphal	Manager	Siem Pang Protected Forest, FA/BLC
7	Sum Phearun	National Vulture Coordinator	BLI
8	Simon Mahood	Tonle Sap Technical Advisor	WCS
9	Prum Sovanna	Deputy Director	Mondulkiri Protected Forest ,FA/WWF
10	Rours Vann	Research Team Leader at KPWS	WCS
11	Ty Srun	Senior Project Officer	BLI
12	Ou Sothy	Manager	Lomphat Wildlife Sanctuary, MoE
13	Phan Channa	Senior Researcher	WWF/MoE
14	Chea Ngeth	Manager	Veun Sai PPF, FA
15	Samrangdy Vecheth	Manger	Phnom Prich wildlife Sanctuary, MoE
16	Seang Darong	Patrol Team Leader	WCS/FA
17	Aylin McNamara	Student/Researcher	Cambridge