



### CAMBODIAN VULTURE CONSERVATION PROJECT

ANNUAL ACTIVITIES REPORT  
JULY 2008 TO JUNE 2009

PECH BUNNAT & HUGO RAINEY  
Email: p.bunnat@gmail.com & hrainey@wcs.org



The partnership of the Cambodia Vulture Conservation Project rehabilitated this juvenile white-rumped vulture after it had been poisoned. It was tagged and released in Western Siemrang in April 2009. It has been observed feeding at vulture restaurants since the release.



**Khmer Summary**

គំរោងអភិរក្សសត្វត្នាតនៅប្រទេសកម្ពុជាដែលមានសមភាគីមន្ត្រីរដ្ឋាភិបាលកម្ពុជា និងអង្គការក្រៅរដ្ឋាភិបាលមួយ ចំនួនបាននឹងកំពុងអនុវត្តធ្វើអោយប្រសើរឡើងនៅស្ថានភាពសត្វត្នាតចាប់តាំងពីឆ្នាំ ២០០៤ ។ ប្រទេសកម្ពុជាបាន ផ្គត់ផ្គង់ដល់ប្រភេទសត្វត្នាតទាំងបីប្រភេទអោយមានស្ថេរភាពប្រកើនឡើង ។ ក្នុងឆ្នាំនេះបានទទួលនូវមោទភាពគួរ អោយកត់សំគាល់បំផុតដោយមានអាជ្ញាប័ន ពីនាយដ្ឋានសុខភាពសត្វកម្ពុជាលើការហាមឃាត់ នៃការប្រើប្រាស់ ថ្នាំឌីក្លូហ្វេនាត (diclofenac) សំរាប់ពេទ្យសត្វ ។ ការអប់រំផ្សព្វផ្សាយបានធ្វើឡើងនៅតាមតំបន់សំខាន់ៗ នៃការ គំរាមកំហែងដោយថ្នាំប្រភេទខាងលើនេះទៅលើសត្វត្នាតដែលត្រូវបានគេអនុវត្តនៅគ្រប់កន្លែងនៃប្រទេសកម្ពុជា ។ អាហារដ្ឋានត្នាតត្រូវបានគេធ្វើជាទៀងទាត់នៅក្នុងតំបន់ចំនួន៧នៃភូមិភាគខាងជើង និងខាងកើតនៃប្រទេសកម្ពុជា ដោយផ្តល់នូវអាហារទៀងទាត់ និងជំនួយធ្វើការតាមដានផ្សេងៗទៀត ។ ការធ្វើជំរឿនប្រចាំឆ្នាំនៅតាមទីតាំងអាហារ ដ្ឋានត្នាតទាំងនេះគឺនៅខែ មិថុនាឆ្នាំ ២០០៩ហើយត្រូវបានគេរកឃើញចំនួនសរុប២៦៦ក្បាលដែលជាការរាប់ឃើញ ចំនួនច្រើនបំផុតនៅប្រទេសកម្ពុជា ជាលើកទី២ ។ សត្វត្នាតស៊ីសាកសពតាមធម្មជាតិក៏ត្រូវបានគេធ្វើការតាមដាន ផងដែរ និងចំនួននៃការបំពុលសត្វស្លាប់ត្រូវបានរកឃើញ ជាលទ្ធផលការបំពុលដោយចៃដន្តទៅលើសត្វត្នាតក្រោយ ពេលស៊ីសត្វចិញ្ចឹម និងសត្វស្រុក ហើយឥឡូវវាប្រហែលជាបញ្ហាដ៏ធ្ងន់ធ្ងរបំផុតនៃការសំលាប់សត្វត្នាតនៅប្រទេស កម្ពុជា ។ ការបន្តពូជគឺមានចំនួនខ្ពស់ស្ទើរតែគ្រប់ទីកន្លែងទាំងអស់របស់សត្វត្នាតនៅរដូវបន្តពូជចុងក្រោយ នេះគឺជា លទ្ធផលនៃការខិតខំប្រឹងប្រែងការពារសំបុកពងកូនសត្វត្នាត ។ ទោះបីយ៉ាងណាក៏ដោយចំនួនសរុបសំបុកត្នាតប្រចាំ តំបន់នៅតែមានចំនួនទាបនៅឡើយ ។ សត្វត្នាតចំនួន២ក្បាលបំពាក់ផ្លាកលេខត្រូវបានគេប្រលែងទៅទីជំរករបស់វា ២កន្លែងផ្សេងៗពីគ្នានៅក្នុងឆ្នាំនេះ ។ ហើយមាននិសិត្យចំនួន២រូបសិក្សាស្រាវជ្រាវអំពីសត្វត្នាតដែលនឹងនៅក្នុងឆ្នាំ នេះមានរយៈពេលវែង ដែលនេះគឺជាការខិតខំប្រឹងប្រែងលើការអភិរក្សសត្វត្នាត ។

**English Summary**

The Cambodia Vulture Conservation Project, a partnership of Cambodian government agencies and NGOs, has been implementing measures to improve the status of vultures in Cambodia since 2004. Cambodia supports one of the few stable or increasing populations of three species of vulture. Its most noteworthy achievement this year was the authorisation by the Cambodian Department of Animal Health of a ban on the veterinary use of the drug diclofenac. Awareness-raising at key sites of the threat that this drug poses to vultures was carried out across their range in Cambodia. Vulture restaurants were run regularly at seven sites across northern and eastern Cambodia to provide a regular food supply and aid monitoring. The annual census at these restaurants in June 2009 found a total of 266 birds, the second highest total counted in the country. Vultures feeding at naturally available carcasses were also monitored and a number of poisoned birds were found as a result. Incidental poisoning of vultures after eating poisoned livestock and domestic animals is now probably the greatest source of mortality of vultures in Cambodia. Breeding success was high at almost all vulture colonies in the latest breeding season as a result of nest protection efforts. However, total number of located vulture nests was low. Two tagged vultures were resighted during the year and two rehabilitated vultures were tagged and released. Two students researching vultures were supported this year which will support long term vulture conservation efforts.

## I. INTRODUCTION

Three species of *Gyps* vulture, White-rumped *Gyps bengalensis*, Slender-billed *G. tenuirostris* and Indian *G. indicus* have been declining at an alarming rate across India, Pakistan and Nepal. Current evidence suggests that populations of these species continue to fall very quickly (Prakash et al. 2007) and scientific evidence has shown that diclofenac (a non-steroidal anti-inflammatory drug) is the major cause of the decline in vulture populations (Oaks et al. 2004, Green et al. 2004, Prakash et al. 2005). Surveys have shown that White-rumped Vulture numbers have declined by more than 99.9% since the early 1990s and other species have declined by over 95% (Prakash et al. 2007). In 2000, all three species were listed by BirdLife/IUCN as Critically Endangered species, which is the highest category of globally threatened species and indicated that their populations will become extinct in the near future if conservationists do not act. In 2006, Red-headed Vulture *Sarcogyps calvus* was also shown to be affected by diclofenac and is believed to be declining at similar rates to others vulture species (Cuthbert et al. 2006); currently it is also listed as Critically Endangered (BirdLife International 2009).

As Cambodia still has stable remnant populations of three vulture species and is one of the few range countries where diclofenac is not used for veterinary purposes; this is a good opportunity to save these species which are declining rapidly to extinction elsewhere. Additionally, a further two species, the Himalayan Griffon *Gyps himalayensis* and Cinereous Vulture *Aegypius monachus* which are not resident in Cambodia, were seen once each in Preah Vihear Protected Forest in February. This is the third record of Himalayan Griffon from this site (previous records December 2004 and February 2007, CVCP unpublished).

The Cambodia Vulture Conservation Project was created in 2004 as the partners recognized the importance of Cambodia for White-rumped, Slender-billed and Red-headed Vultures. The Northern, Eastern Plains and upper Mekong of Cambodia presented the best opportunity to conserve their populations. The project is a partnership between Government agencies and NGOs. The project activities have been led by the Wildlife Conservation Society (WCS), and other members include Birdlife International, the Royal Society for the Protection of Birds (RSPB), World Wide Fund for Nature (WWF) and the Angkor Centre for the Conservation Biodiversity (ACCB) and also the government institutions of the General Department of Administration for Nature Conservation and Protection (GDANCP) of the Ministry of Environment (MoE), and the Forestry Administration (FA) and Department of Animal Health (DAH) of the Ministry of Agriculture, Forestry and Fisheries (MAFF). Research institutions working with CVCP include the Royal University of Agriculture, Cambodia, the US National Aviary and Cornell University, USA.

## II. GOALS AND OBJECTIVES

### Goals:

The goals of the Cambodia Vulture Conservation Project are to prevent the extinction of Cambodia's vulture populations, restore their population size to levels consistent with their long-term survival, and to mitigate threats throughout their range in Cambodia.

### Activities:

1. Provision of food at vulture restaurants;
2. Annual vulture census at restaurants;
3. Monitoring and protection of vulture nests;

4. Assisting the implementation of a ban on the veterinary use of diclofenac;
5. Monitoring of availability and veterinary use of diclofenac;
6. Promoting awareness of vulture conservation at target sites;
7. Building capacity of project staff at target sites;
8. Population estimation using DNA identification from feathers.

### **III. PROJECT STAFF**

#### Core staff

- Pech Bunnat – GDANCP, MoE and WCS Cambodian Vulture Conservation Project Manager
- Hugo Rainey – WCS Technical Advisor, Cambodia Vulture Conservation Project and Northern Plains Project

#### Vulture rangers

- En Sophal – WCS Ranger, Preah Vihear Protected Forest.
- Nget Chivansu – WCS Ranger, Kulen Promtep Wildlife Sanctuary.
- Sem Samon – WWF Ranger, Phnom Prich Wildlife Sanctuary.
- Kham Sary – WCS Ranger, Lumphat Wildlife Sanctuary.
- Meang Koy – WCS Ranger. Seasan site, Stung Treng province.
- Loun Bun Paing – WCS Ranger, Western Siempang Important Bird Area (IBA).
- Man Mai – Birdlife Ranger, Western Siempang IBA.
- Soubin Rattana – Birdlife Ranger, Western Siempang IBA.
- Kheam Simean – WWF Ranger, Mondulkiri Protected Forest

#### Other Staff

- Tan Setha – Director, Preah Vihear Protected Forest, Wildlife Protection Office, FA, MAFF and WCS Project Manager, Preah Vihear Protected Forest.
- Chark Sokhavicheaboth – Director, Phnom Prich Wildlife Sanctuary, GDANCP, MoE and WWF Project Manager.
- Ear Sokha – Director of Kulen Promtep Wildlife Sanctuary GDANCP, MoE and WCS Project Manager, Kulen Promtep Wildlife Sanctuary, Preah Vihear province.
- Creak Cruice – WWF Technical Advisor, Phnom Prich Wildlife Sanctuary and Mondulkiri Protected Forest Project.
- Tom Gray – WWF Technical Advisor, Phnom Prich Wildlife Sanctuary and Mondulkiri Protected Forest Project.
- By Sengleng – Director, Lumphat Wildlife Sanctuary, GDANCP, MoE and Birdlife Project Officer.
- Keo Sopheak – FA, MAFF and WWF Project Manager of Mondulkiri Protected Forest (MPF).
- Doung Kong – FA, MAFF, WWF counterpart, Stung Treng province.
- Phan Channa – WWF counterpart, Phnom Prich Wildlife Sanctuary.
- Net Norint – BirdLife staff, Western Siempang IBA, Stung Treng province.

### **IV. VULTURE RESTAURANTS**

The first vulture restaurant carried out in Cambodia was in Preah Vihear Protected Forest (PVPF) in 2003 and today vulture restaurants have been established at seven sites across the country. The vulture restaurants are an effective method of increasing food available to

vultures every month at sites managed by the FA and GDANCP. There are seven permanent vulture feeding stations (vulture restaurants) (see Table 1) with an additional restaurant in PVPF as part of community-managed ecotourism. Vulture restaurants are usually conducted monthly at each site, except Mondulkiri Protected Forest (MPF) and Phnom Prich Wildlife Sanctuary (PPWS) which alternated monthly for part of the reporting period and are now usually monthly. Additionally, the main restaurant in PVPF was organised more frequently in January and February because of demand from visitors. During the annual vulture census in June seven restaurants were organised. Below we describe vulture restaurant activities and the results of this work from July 2008 to June 2009.

A summary of the main vulture restaurants and testing of the tourism site for vulture activity and total numbers of vultures recorded at each restaurant is given in Table 2. Below also are dates of the impressive total of 99 restaurants held and the results of vulture counts at each vulture restaurant from July 2008 to June 2009 (Table 3a-h).

**Table 1.** List and location of vulture restaurants in 2008-09. The PVPF tourism site moved to the second pair of coordinates given in April. \*The O Koki site was replaced in April by the Veal Cheung Kao site as numbers of vultures were poor at the O Koki site.

Site	Province	UTM coordinates	
Preah Vihear Protected Forest	Preah Vihear	554004	1540043
Kulen Promtep Wildlife Sanctuary	Preah Vihear	485013	1543879
Western Siempang IBA	Stung Treng	649256	1563359
Seasan site	Stung Treng	665298	1510843
Lumphat Wildlife Sanctuary	Ratanakiri	706759	1488199
Mondulkiri Protected Forest	Mondulkiri	736915	1432106
Phnom Prich Wildlife Sanctuary	Mondulkiri	715098	1432473
*O Koki, PVPF	Preah Vihear	538193	1553698
*Veal Cheung Kao, PVPF	Preah Vihear	544672	1543833

**Table 2.** Activity and total numbers of vultures recorded at each site from July 2008 to June 2009 and the dates of the annual vulture census. NA is no activity. \*PVPF counts are the principal restaurants organised by the CVCP and not those paid for by tourists (tourists visited the principal site in addition to the 'Tourism' restaurants in PVPF).

	PVPF*	KPWS	Siempang	Seasan	LWS	MPF	PPWS	Tourism
<b>Jul</b>	44	1	51	39	49	NA	NA	4
<b>Aug</b>	47	3	63	40	6	NA	NA	7
<b>Sep</b>	56	3	33	36	37	11	NA	NA
<b>Oct</b>	55	2	54	23	38	NA	10	NA
<b>Nov</b>	47	3	60	28	31	NA	NA	NA
<b>Dec</b>	61	0	62	35	0	NA	NA	2
<b>Jan</b>	65	2	68	23	9	NA	1	2
<b>Feb</b>	61	2	48	26	18	24	NA	2
<b>Mar</b>	42	2	46	35	3	11	24	3
<b>Apr</b>	53	2	61	25	23	19	7	4
<b>May</b>	57	2	57	19	5	29	4	9
<b>10-Jun</b>	54	2	45	45	35	21	7	NA
<b>17-Jun</b>	NA	NA	NA	NA	NA	NA	NA	14
<b>20-Jun</b>	62	2	64	48	64	12	10	NA

**Table 3a-h.** Counts of all species recorded at each site July 2008 to June 2009.*a. Preah Vihear Protected Forest*

Date	RHV		WRV		SBV		CNV		HMG		Total
	Juv	Ad	Juv	Ad	Juv	Ad	Juv	Ad	Juv	Ad	
17-Jul-08	14		25		5		0		0		44
09-Aug-08	11		28		8		0		0		47
24-Sep-08	13		37		6		0		0		56
13-Oct-08	11		39		5		0		0		55
24-Nov-08	9		32		6		0		0		47
24-Dec-08	2	10	4	42	0	3	0		0		61
15-Jan-09	7		20		3		0		0		30
25-Jan-09	11		33		5		0		0		49
28-Jan-09	2	8	4	39	2	9	0	0	0	0	64
30-Jan-09	3	11	8	22	2	7	0	0	0	0	53
06-Feb-09	1	3	12	30	0	1	0	0	0	0	47
08-Feb-09	4	6	10	21	0	1	1	0	1	0	44
15-Feb-09	1	3	8	21	0	3	0	0	0	0	36
21-Feb-09	3	5	12	36	1	4	0	0	0	0	61
28-Feb-09	3	4	7	15	0	1	0	0	0	0	30
25-Mar-09	5	6	9	17	2	3	0	0	0	0	42
10-Apr-09	5	10	14	20	1	3	0	0	0	0	53
16-May-09	3	6	13	27	0	0	0	0	0	0	49
25-May-09	4	9	10	29	1	4	0	0	0	0	57
10-Jun-09	4	7	16	22	2	3	0	0	0	0	54
20-Jun-09	0	2	16	38	2	4	0	0	0	0	62

*b. Preah Vihear Protected Forest - Ecotourism site. This was at O Koki in PVPF from July 2008 until March 2009. It was moved to Veal Cheung Kao in PVPF in April 2009 where it is still active.*

Date	RHV		WRV		SBV		CNV		HMG		Total
	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	
13-Jul-08	3		1		0		0	0	0	0	4
14-Aug-08	5		2		0		0	0	0	0	7
11-Dec-08	2		0		0		0	0	0	0	2
11-Jan-09	2		0		0		0	0	0	0	2
07-Feb-09	2		0		0		0	0	0	0	2
13-Mar-09	3		0		0		0	0	0	0	3
30-Apr-09	0	4	0		0		0	0	0	0	4
25-May-09	0	7	0	2	0		0	0	0	0	9
17-Jun-09	10		4		0		0	0	0	0	14

*c. Kulen Promtep Wildlife Sanctuary*

Date	RHV		WRV		SBV		CNV		HMV		Total
	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	
20-Jul-08	0	1	0	0	0	0	0	0	0	0	1
25-Aug-08	0	3	0	0	0	0	0	0	0	0	3
22-Sep-08	0	3	0	0	0	0	0	0	0	0	3
16-Oct-08	0	2	0	0	0	0	0	0	0	0	2
09-Nov-08	0	2	0	0	0	0	0	0	0	0	2
09-Dec-08	0	0	0	0	0	0	0	0	0	0	0
15-Jan-09	0	2	0	0	0	0	0	0	0	0	2
17-Feb-09	0	2	0	0	0	0	0	0	0	0	2
15-Mar-09	0	2	0	0	0	0	0	0	0	0	2
08-Apr-09	0	2	0	0	0	0	0	0	0	0	2
10-May-09	0	2	0	0	0	0	0	0	0	0	2
10-Jun-09	0	2	0	0	0	0	0	0	0	0	2
20-Jun-09	0	2	0	0	0	0	0	0	0	0	2

*d. Western Siempang IBA*

Date	RHV		WRV		SBV		CNV		HMV		Total
	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	
10-Jul-08	4		36		11		0	0	0	0	51
13-Aug-08	6		43		14		0	0	0	0	63
08-Sep-08	7		22		4		0	0	0	0	33
07-Oct-08	4		33		17		0	0	0	0	54
08-Nov-08	2		39		19		0	0	0	0	60
12-Dec-08	2		36		24		0	0	0	0	62
10-Jan-09	2		41		25		0	0	0	0	68
09-Feb-09	0	2	11	19	6	10	0	0	0	0	48
12-Mar-09	1	4	4	19	4	14	0	0	0	0	46
10-Apr-09	1	4	11	24	1	20	0	0	0	0	61
29-Apr-09	1	6	3	7	0	4	0	0	0	0	21
10-May-09	2	4	12	19	6	11	0	0	0	0	54
21-May-09	3	4	16	19	5	10	0	0	0	0	57
10-Jun-09	2	4	11	21	3	4	0	0	0	0	45
20-Jun-09	2	5	16	25	6	10	0	0	0	0	64

*e. Seasan site*

Date	RHV		WRV		SBV		CNV		HMV		Total
	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	
24-Jul-08	10		24		5		0	0	0	0	39
17-Aug-08	9		25		6		0	0	0	0	40
15-Sep-08	6		25		5		0	0	0	0	36
16-Oct-08	4		12		7		0	0	0	0	23
23-Nov-08	5		16		7		0	0	0	0	28
18-Dec-08	7		23		5		0	0	0	0	35
23-Jan-09	3		15		5		0	0	0	0	23
17-Feb-09	2	3	5	8	3	5	0	0	0	0	26
12-Mar-09	2	4	9	13	3	4	0	0	0	0	35
23-Apr-09	2	3	6	7	3	4	0	0	0	0	25
19-May-09	0	3	9	2	2	3	0	0	0	0	19
10-Jun-09	3	6	9	21	2	4	0	0	0	0	45
20-Jun-09	3	5	12	21	3	4	0	0	0	0	48

*f. Lumphat Wildlife Sanctuary*

Date	RHV		WRV		SBV		CNV		HMV		Total
	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	
30-Jul-08	13		24		12		0	0	0	0	49
24-Aug-08	3		3		0		0	0	0	0	6
29-Sep-09	12		16		9		0	0	0	0	37
02-Nov-08	12		16		10		0	0	0	0	38
28-Nov-08	8		12		11		0	0	0	0	31
09-Jan-09	0	0	0	0	0	0	0	0	0	0	0
30-Jan-09	3		4		2		0	0	0	0	9
06-Mar-09	2	4	3	5	1	3	0	0	0	0	18
28-Mar-09	0	2	0	1	0	0	0	0	0	0	3
08-May-09	2	5	3	7	2	4	0	0	0	0	23
29-May-09	0	2	0	3	0	0	0	0	0	0	5
10-Jun-09	4	7	5	8	3	8	0	0	0	0	35
20-Jun-09	6	7	18	23	4	6	0	0	0	0	64

*g. Phnom Prich Wildlife Sanctuary*

Date	RHV		WRV		SBV		CNV		HMV		Total
	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	
06-Sep-08	0	0	0	0	0	0	0	0	0	0	0
25-Oct-08	4		4		2		0	0	0	0	10
23-Jan-09	0	1	0	0	0	0	0	0	0	0	1
27-Mar-09	0	2	5	13	2	2	0	0	0	0	24
30-Apr-09	0	1	0	6	0	0	0	0	0	0	7
28-May-09	0	1	0	3	0	0	0	0	0	0	4
10-Jun-09	0	1	0	6	0	0	0	0	0	0	7
20-Jun-09	2	2	2	6	0	0	0	0	0	0	12



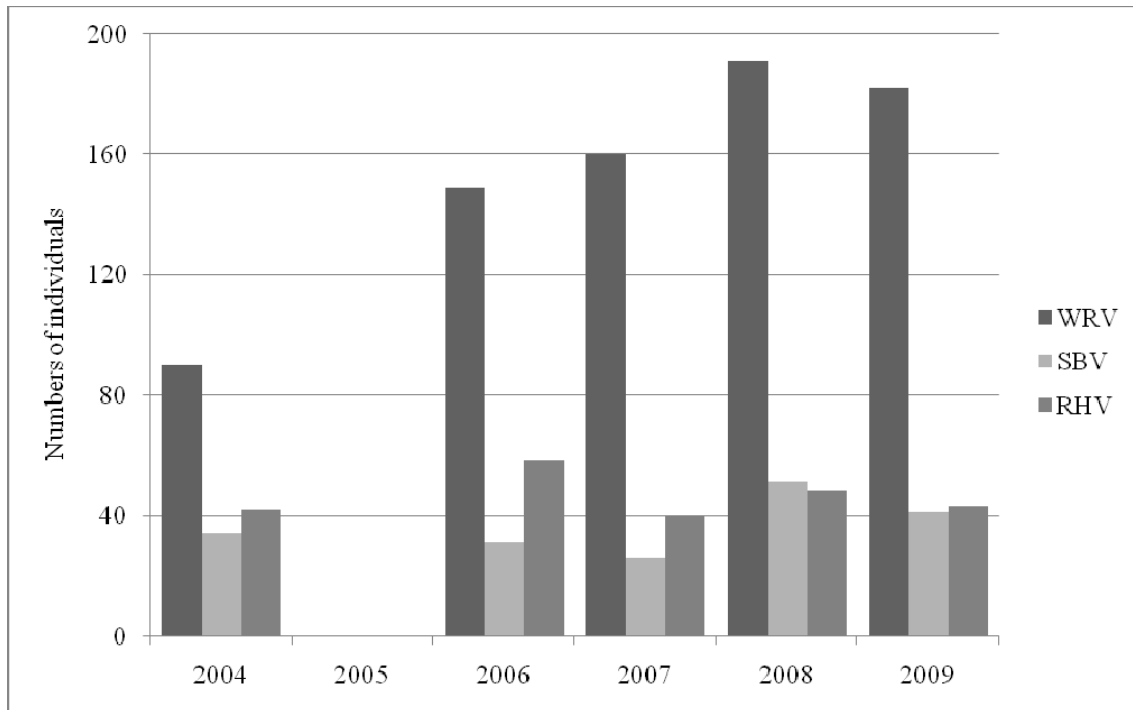
*h. Mondulkiri Protected Forest*

Date	RHV		WRV		SBV		CNV		HMV		Total
	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	Juv	Adu	
30-Sep-09	7		4		0	0	0	0	0	0	11
02-Feb-09	2	5	5	10	0	2	0	0	0	0	24
28-Mar-09	0	3	3	3	0	2	0	0	0	0	11
27-Apr-09	2	6	3	5	1	2	0	0	0	0	19
18-May-09	2	6	4	15	0	0	0	0	0	0	27
10-Jun-09	0	3	9	6	1	2	0	0	0	0	21
20-Jun-09	2	2	2	6	0	0	0	0	0	0	12

**V. ANNUAL VULTURE CENSUS**

The annual vulture census – simultaneous data collection on vulture population at all seven permanent sites across their home range in Cambodia – was conducted for the sixth time on 10 and 20 June 2009 (previously all years from 2004-2008 except 2005). The year's census counted a total of 266 vultures including 182 White-rumped Vultures, 41 Slender-billed Vultures and 43 Red-headed Vultures (Table 4). These numbers are similar, although slightly lower than that of last year's census and is the second highest count for both White-rumped and Slender-billed Vultures in Cambodia (Figure 1, Table 4). The vulture population appears to be increasing and indicates that the activities of the Cambodia Vulture Conservation Project have been successful, principally by increasing the availability of food each month and protecting nests. Additionally, wider conservation activities within larger sites such as Mondulkiri Forest Protected Program or Preah Vihear Protected Forest may also be contributing to the security of vulture nesting colonies and the return of large mammal species, their principal food supply. Population estimation based on DNA samples (see research below) will help confirm the effectiveness of this monitoring technique. This will be particularly important for Red-headed Vultures which have been less well studied to date and whose ecology and behaviour may limit the effectiveness of annual monitoring at restaurants; Red-headed Vultures are believed to be partially territorial and predatory, thus they may rely less on large carcasses (and therefore restaurants) for food than other species.

This census collects data on minimum populations of the three target vulture species in Cambodia. It provides accurate information on the vulture populations as regular monthly vulture restaurants do not usually coincide (to ensure that food is available on many different days in each month) and thus counts outside the census period at separate sites are not necessarily cumulative. All vultures are counted and we have also initiated monitoring of age and sex classes. This will permit us to assess both the health of the population structure by counting the proportion of young birds in the population; a relatively high number of young birds indicates good breeding success and that young birds are being recruited into the population. If we can distinguish both age and sex classes (the latter is only possible for Red-headed Vultures), we can subdivide the population during the annual census which may enhance the overall total count. Currently, our ability to identify each age and sex class is limited by lack of telescopes as well as the difficulties of separating sub-adults from other age classes and separating slender-billed vultures of all age classes.



**Figure 1.** Vulture census results by year. WRV – White-rumped Vulture, SBV – Slender-billed Vulture, RHV – Red-headed Vulture. No census was carried out in 2005.

**Table 4a-e.** Cambodia Vulture Conservation Project census results 2004, 2006, 2007, 2008 and 2009. Two counts are conducted between May and July each year. In 2004 both Virachey National Park (NP) and Seima Biodiversity Conservation Area (SBCA) (now Seima Protection Forest) were surveyed, but because of limited results these sites were not continued in subsequent years.

*a. 2004*

Date: 10 July 2004				
Location	WRV	SBV	RHV	Total
PVPF	27	5	12	44
LWS	19	15	10	44
Siempang	31	10	8	49
Seasan			2	2
Virachey NP			2	2
PPWS	11	4	6	21
SWA	<i>No Census</i>			
SBCA	0	0	0	0
<b>Total</b>	<b>88</b>	<b>34</b>	<b>40</b>	<b>162</b>

Date: 26 July 2004				
WRV	SBV	RHV	Total	
14	1	15	30	
31	15	8	54	
16	4	4	24	
3		5	8	
	2		2	
8		3	11	
18	3	7	28	
<i>No Census</i>				
<b>90</b>	<b>25</b>	<b>42</b>	<b>157</b>	

*b. 2006*

Date: 10 May 2006				
Location	WRV	SBV	RHV	Total
PVPF	39	5	12	56
LWS	15	6	18	39
Siempang	17	7	5	29
Seasan	35	6	7	48
PPWS	28	2	10	40
SWA	15	1	6	22

Date: 24 May 2006				
WRV	SBV	RHV	Total	
23	5	13	41	
11	5	8	24	
18	9	3	30	
25	12	6	43	
2	0	1	3	
4	0	1	5	

SBCA	0	0	0	0
<b>Total</b>	<b>149</b>	<b>27</b>	<b>58</b>	<b>234</b>

0	0	0	0
<b>83</b>	<b>31</b>	<b>32</b>	<b>146</b>

## c. 2007

Date: 10 June 2007				
Location	WRV	SBV	RHV	Total
PVPF	66	1	7	74
KPWS	<i>No restaurant</i>			
LWS	5	3	7	15
Siempang	42	13	7	62
Seasan	25	4	6	35
PPWS	13	0	1	14
SWA	9	3	7	19
<b>Total</b>	<b>160</b>	<b>24</b>	<b>35</b>	<b>219</b>

Date: 24 June 2007			
WRV	SBV	RHV	Total
62	4	7	73
2	0	1	3
16	7	14	37
24	5	4	33
13	8	2	23
32	2	9	43
1	0	3	4
<b>150</b>	<b>26</b>	<b>40</b>	<b>216</b>

## d. 2008

Date: 10 June 2008				
Location	WRV	SBV	RHV	Total
PVPF	26	4	19	49
KPWS	0	0	0	0
LWS	12	7	8	27
Siempang	39	13	5	57
Seasan	31	6	9	46
PPWS	5	0	2	7
SWA	0	0	5	5
<b>Total</b>	<b>113</b>	<b>30</b>	<b>48</b>	<b>191</b>

Date: 20 June 2008			
WRV	SBV	RHV	Total
43	11	17	71
0	0	0	0
44	13	6	63
41	20	2	63
32	4	8	44
13	2	3	18
18	1	8	27
<b>191</b>	<b>51</b>	<b>44</b>	<b>286</b>

## e. 2009

Date: 10 June 2009							
Location	WRV		SBV		RHV		Total
	Juv	Adu	Juv	Adu	Juv	Adu	
PVPF	16	22	2	3	4	7	54
KPWS	0	0	0	0	0	2	2
LWS	5	8	3	8	4	7	35
Siempang	11	21	3	4	2	4	45
Seasan	9	21	2	4	3	6	45
PPWS	0	6	0	0	0	1	7
MPF	9	6	1	2	0	3	21
<b>Total</b>	<b>134</b>		<b>32</b>		<b>43</b>		<b>209</b>

Date: 20 June 2009							
Location	WRV		SBV		RHV		Total
	Juv	Adu	Juv	Adu	Juv	Adu	
PVPF	16	38	2	4	0	2	62
KPWS	0	0	0	0	0	2	2
LWS	18	23	4	6	6	7	64
Siempang	16	25	6	10	2	5	64
Seasan	12	21	3	4	3	5	48
PPWS	0	5	0	2	0	3	10
MPF	2	6	0	0	2	2	12
<b>Total</b>	<b>182</b>		<b>41</b>		<b>39</b>		<b>262</b>

**VI. CARCASS SURVEY AND POISONING INCIDENTS**

Surveys of vultures at carcasses sites were carried out at five sites: KPWS, LWS PPWS, PPF, Seasan and Western Siempang. However, carcasses generally had little meat because people had already removed it for personal consumption. Below are the numbers of vultures recorded at carcasses at each site (Table 5a-d). Carcasses that do not have vultures are not detailed in this annual report. Monitoring of carcasses allows us to respond rapidly to poisoning incidents and mitigate the threat that this poses to the vulture population here.

The buffalo carcasses that were recorded in PVPF in June and July 2009 were studied by the WCS Global Health Program and were found to have died from haemorrhagic septicaemia, a disease which occurs annually in south-east Asia and afflicts buffalo most frequently. In PVPF in July 2009 it is believed to have killed more than 30 buffalo, possibly over 100, many more than in previous years. The normal reporting period for this annual report is 1 July 2008 – 30 June 2009, but because of the potential seriousness of such a disease outbreak, we mention our findings here to inform a wider audience in good time.

**Table 5a-f.** Numbers of vultures recorded during carcass surveys from July 2008 to June 2009.

*a. Preah Vihear Protected Forest*

Carcass	Date	RHV	WRV	SBV	Total
Dog	10-Dec-08	2	0	0	2
Cow	15-May-09	17	0	0	17
Buffalo	30-Jun-09	4	24	1	29
Buffalo	01-Jul-09	3	8	0	11
Buffalo	02-Jul-09	5	32	3	40

*b. Kulen Promtep Wildlife Sanctuary*

Carcass	Date	RHV	WRV	SBV	Total
Cow	2-Aug-08	5	0	0	5

*c. Lumphat Wildlife Sanctuary*

Carcass	Date	RHV	WRV	SBV	Total
Buffalo	13-Jul-08	8	18	12	38
Dog	04-Dec-08	A flock of vultures were seen feeding, but one RHV amongst them could not fly. It was captured by the ranger and then released the next day by rangers, apparently healthy.			
Cow	18-Mar-09	8	3	0	11
Cow	24-Mar-09	Local people said that a lot of vultures were seen, but they could not identify them to species			
Cow	23-Apr-09	3	0	0	3
Cow	17-May-09	12	8	3	23

*d. Phnom Prich Wildlife Sanctuary*

Carcass	Date	RHV	WRV	SBV	Total
Cow	09-Sep-08	30 vultures not identified to species			30

*e. Seasan site*

Carcass	Date	RHV	WRV	SBV	Total
Buffalo	08-Dec-08	One flock of vultures fed on a poisoned buffalo carcass. 7 WRV died, 2 WRV were rescued, subsequently rehabilitated (qv) and then released back into the wild in 2009.			
Buffalo	22-Feb-09	4	7	0	11

*f. Western Siempang*

Carcass	Date	RHV	WRV	SBV	Total
Cow	27-Dec-09	60-70 vultures were found by local people but they did not identify them.			

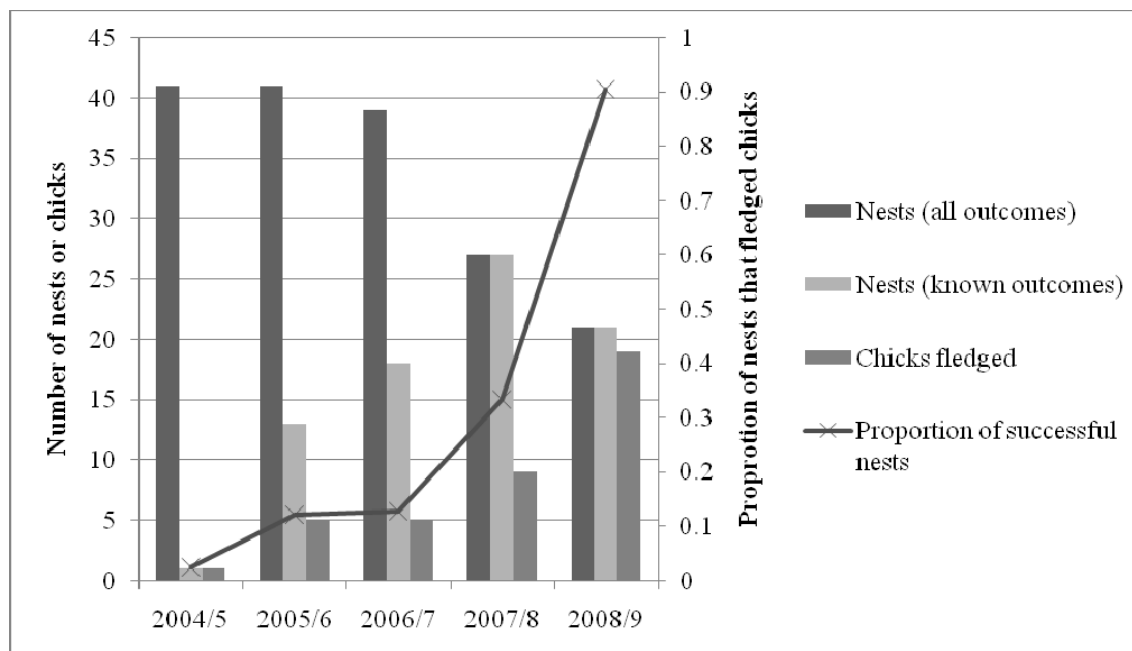
Poisoning is now probably the most important known cause of vulture mortality in Cambodia. Nine White-rumped Vultures and three Red-headed Vultures were poisoned this year, of which seven White-rumped and one Red-headed Vultures died. Prompt action by the CVCP enabled rapid rehabilitation of the remaining four vultures. The nine white-rumped vultures poisoned were in Seasan district. They had fed on a single poisoned buffalo. The buffalo had died after drinking water which

had been poisoned by fishermen. All other cases were also as a result of artificial (probably agricultural) poisons used deliberately to kill dogs. One other juvenile White-rumped Vulture died in captivity from unknown causes. This was six months after it was found apparently starving in Takeo province, outside the normal range of vultures in Cambodia, and taken into captivity.

## VII. NEST PROTECTION

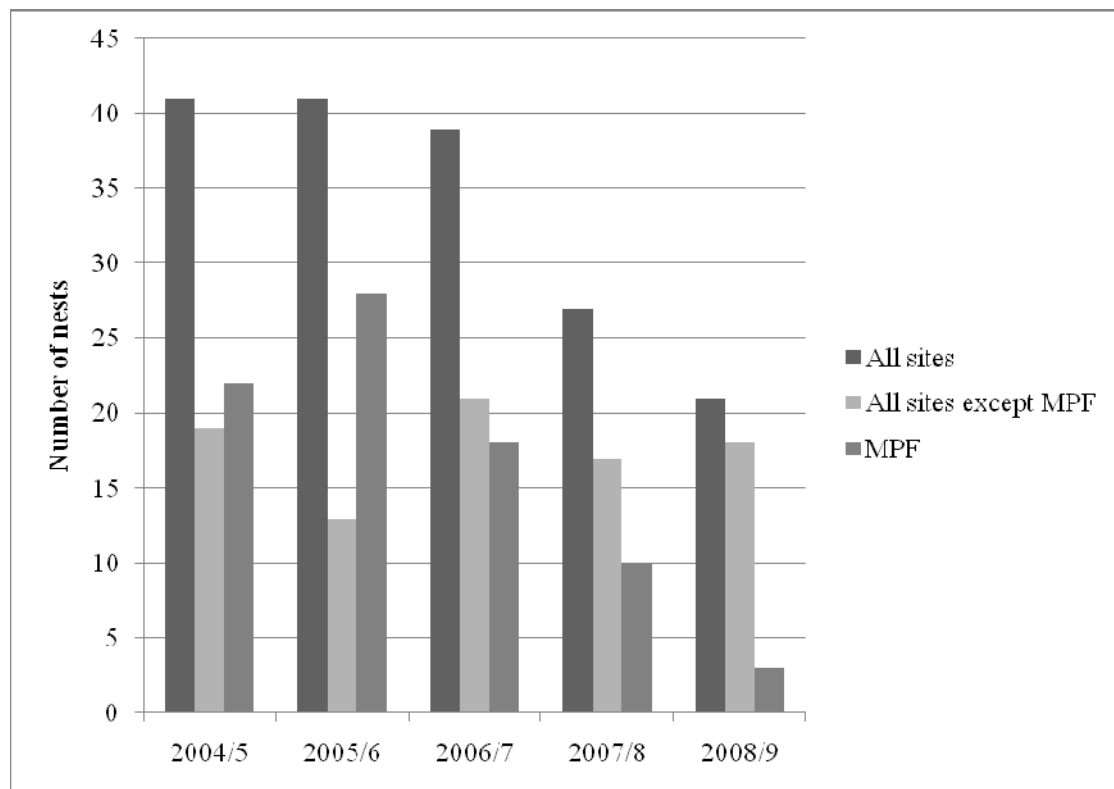
The project located vulture nests, searching between October to December 2008, and nests were protected from January to April 2009. Nests were located at the sites listed below and nest protection activities are also detailed. The bird nest protection scheme developed at Prek Toal and at KPWS and PVPF by WCS for waterbird species has been successfully applied to protect vulture nests. This scheme pays local people to protect nests until the chicks have fledged successfully. This simple scheme has proved highly effective in increasing numbers of highly threatened waterbird species elsewhere and appears to be effective for vultures. Vulture nest protection has been improved and two community nest protectors are now assigned to most colonies. This enables minor, but common threats such as fire or predation by macaques to be controlled more easily, as well as those of human origin.

The success of this improvement can be seen at the sites at which it has been applied; fledging success was 100% where nests were protected (only one colony was not protected) (Figure 2). This is the highest confirmed number of fledgling vultures since the project started. However, numbers of nests have declined since the project started (Figure 3). As directs from anthropogenic factors are more limited in Mondulkiri Protected Forest (MPF), protection of nests here is by ranger patrols, thus there is less information on numbers of nests and success rates. Thus limited information about this site, which did have up to 28 nests at one time, is the main factor linked to a decline in total number of nests. The total number of nests excluding MPF has remained approximately stable over the five years from 2004/5 to 2008/9. It is hoped that breeding attempts by vultures will increase in Cambodia as a result of improved protection and improved food availability. Adult vultures do not usually breed each year because of the high investment required for breeding and additionally, vultures do not generally breed until aged at least 4-7 years old. Thus, vultures that were fledged in the early stages of the vulture project are not likely to start breeding until 2010.



**Figure 2.** Vulture breeding efforts and success in Cambodia 2004/5 to 2008/9. Details of numbers of all nests found, numbers and proportions of successful nests and numbers of chicks fledged. The total number of nests (left-hand axis) is marked in the dark grey bars and this appears to have declined by 50% since the project started. The number of nests with known outcomes (i.e. whether or not the chick

in each nest fledged) has increased throughout the life of the project (light grey bars) as has the number of chicks known to have fledged (mid grey bars) (both on left-hand axis). The effectiveness of the implementation of nest protection and monitoring can be seen. Proportion of successful nests includes those with known and unknown outcomes.



**Figure 3.** Numbers of vulture nests of all species in Cambodia 2004/5 to 2008/9. The known number of colonies increased from 2004/5 to 2008/9 and additional colonies are likely to be found (indeed a new site has been found between the end of the reporting period and the completion of this report: this data is not included in this report). Despite this, the total number of vulture nests has declined as colonies have not been protected in Mondulkiri Protected Forest (MPF).

#### *Preah Vihear Protected Forest*

Three White-rumped Vulture nests at a colony were found on 1 November 2008 in PVPF. Two local people were asked to protect the colony from January to April 2009 until chicks fledged. Two Red-headed Vulture nests were found at different sites one on 22 December 2008 and the other on 19 January 2009. At all nests, each chick (one chick in each nest) fledged successfully as a result of improved protection by community nest protectors and were they were checked each month by the PVPF vulture ranger.

#### *Kulen Promtep Wildlife Sanctuary*

This year we searched for nests from October to December 2008 in the dry season but none were found. In 2007/8 a pair of Red-headed Vultures bred at this site, although the nest failed as a result of a forest fire.

#### *Lumphat Wildlife Sanctuary*

On 12 December 2008 five White-rumped Vulture nests were found. Two local people protected these nests from January to April 2009. All three of the nests produced a chick each and all fledged successfully. On 10 January 2009, four Slender-billed Vulture nests were found. Two local people protected the nests from January to April 2008 until the chicks were able to fly from their nests. Each Slender-billed Vulture nest produced a chick each.

#### *Mondulkiri Protected Forest:*

From 18-20 September, 2008 a vulture nest survey was conducted in Mondulkiri Protected Forest and a total of five White-rumped Vulture nests were found. Only one nest was seen to be active with an adult sitting in it, although a further 13 birds were sitting on nearby trees, when the survey team visited on 20 April, 2008. It is believed that only one nest was successful. These nests were not part of the nest protection scheme.

*Phnom Taprom mountain, Mondulkiri province*

Three White-rumped Vulture nests and one Red headed Vulture nest were found at Phnom Taprom mountain close to the Seasan restaurant site on 25 November 2008. Two local people protected the nests from January to April 2009 until the chicks were able to fly from their nests. All four nests produced a chick each. Additionally this year we found four Lesser Adjutant nests at this site. The chicks were found to have fledged on 23 March, 2008 by Pech Bunnat and rangers.

### VIII. MARKED BIRD RE-SIGHTINGS

From June 2008 to June 2009, four of eighteen birds that were originally marked were recorded in PVPF and Western Siempang during the reporting period (Table 5). Both GB1 and GB7 were seen in 2007-2008. GB2 and GB4, which had been observed in 2006-2007 in PVPF, have not been seen since then.

**Table 5.** Date and location of each resighting of tagged birds.

Tag	Date applied	Date/Site											
		Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09
GB1	06-Dec-03								PVPF				
GB7	09-May-05	PVPF	PVPF	PVPF				PVPF	PVPF				PVPF
9	24-Jan-09								PVPF	PVPF		PVPF	PVPF
10	27-Apr-09										WSP	WSP	

### IX. RESEARCH ACTIVITIES

#### **Cheat Vichet – Vulture conservation in Siempang District.**

This year the Cambodian Vulture Conservation Project provided both technical and financial support from March to June 2009 for Cambodian student, Mr. Cheat Vichet to write his thesis on Vulture Conservation in Siempang District. He completed this thesis for a bachelor's degree in Forestry at the Faculty of Forestry Science, Royal University of Agriculture. His project included interviewing people in the local community and asking questions about their perceptions of vulture conservation. This has provided useful feedback for management. It will help good relationships with local communities and authorities on the situation in villages. It will also be a useful reference document for vulture researchers in Cambodia.

#### **Yula Kapetanacos – Estimation of vulture population sizes from DNA**

The Cambodia Vulture Conservation Project has collected feathers from all seven principal vulture restaurants to study vulture populations using DNA. Yula Kapetanacos from Cornell University and working with the US National Aviary will extract DNA from these feathers to estimate vulture population sizes using mark-recapture techniques. These feathers will be exported shortly to the USA. This is a technique which has been used successfully for African *Loxodonta africana* (Eggert et al. 2003) and Asian elephants *Elephas maximas* (Hedges et al. 2007, Pollard et al. 2008) and also for Imperial Eagles *Aquila heliaca* (Rudnick et al. 2005, 2007).

## **X. DICLOFENAC BAN AND EDUCATION**

In April the project assisted the Department of Animal Health in banning the veterinary use of diclofenac. We prepared and distributed 900 copies of a document justifying the ban. This was sent to government veterinary staff in the provinces and districts of the Northern and Eastern Plains as well as given to local community members in important vulture conservation areas. This document also included details of a suitable alternative to diclofenac – meloxicam. This will assist in preventing diclofenac ever entering the vulture food chain. Awareness-raising will continue in future years.

Surveys were conducted two times at each site of veterinary drugs available to local communities. The results still indicate that diclofenac is not available in and around the vulture conservation areas of Cambodia, but we will continue surveys to maintain surveillance. This will be expanded in the coming year to improve collaboration with district veterinary officers.

Vulture rangers at each site have received training in education activities. They have been taught how to explain to communities the threats that vultures face and also, where appropriate, to explain how important they are for bringing tourists to sites. This year 400 school exercise books for vulture awareness were given to primary schools around the protected areas which are the sites of vulture conservation activities.

## **XI. CONSTRAINTS TO PROJECT ACTIVITIES**

- a. Further training is needed more for rangers to enable them to distinguish adult and juvenile vultures' identification. This is required to aid estimates of recruitment to the population.
- b. Data is sometimes sent late from sites and staff sometimes needs reminding to send data.
- c. Grass can grow too high for the restaurant sites and vultures to be visible, so the grass may need to be cut at each site.
- d. The price of cows and buffalos has increased as there is competition from traders buying them for food and export.
- e. Nest protection activities, although improved, may have been limited this year and can be improved with better planning and coordination at target areas.
- f. Binoculars and telescopes are required at each site to ensure observers can distinguish adults, sub-adults and juveniles and sex classes.

## **XII. CONCLUSIONS**

The second largest count of vultures was made at the census this year in June last. This is a significant achievement for a project with a relatively modest level of investment and the project and its partners can be proud of its success. Coordination across the country to ensure that the restaurants are in place, counts are coordinated and nests protected, has improved and we have identified further areas where success should increase in future years. The most important of these is to improve nest protection and is a key objective of the Cambodia Vulture Conservation Project. We must protect vultures at nests and colonies. Nest protection is relatively simple and cost-effective and provides income to local communities at relatively low cost. It is essential as a management tool as increasing recruitment of newly fledged juvenile birds to a small long-lived population is the only way the vulture population will increase more rapidly.

Accidental poisoning of vultures as a result of illegal poisoning of ponds and rivers are a significant threat. Controlling these through awareness-raising, community management and law enforcement patrols is essential. This year at the Seasan site seven White-rumped Vultures died from poisoning. Two others were rescued by ACCB, FA, MoE and WCS staff and later released back to the wild in PVPF and Western Siempang. At Lumphat Wildlife Sanctuary one Red-headed Vulture which had fed on a poisoned dog carcass was rescued by a ranger. In Preah Vihear Protected Forest two Red-headed Vultures fed on a poisoned dog carcass. One died and another was rescued by the ranger and then released.



The commitment made by the Royal Cambodian Government to ban the veterinary use of diclofenac is very good news and we will continue to work with the government to ensure that this ban is implemented. It is also encouraging that this drug has not yet been found in veterinary use here.

### **XIII. RECOMMENDATIONS**

- Vulture restaurants should be continued and carried out regularly at all sites.
- The Slender-billed Vulture colony that was at Phnom Taprom, Steung Treng and Rattanakiri must be located very year.
- Vulture nest protection should be started when the nests are found until the chicks have fledged.
- Train patrol teams and other staff in the value of protecting nests of threatened species is would aid vulture conservation.
- Continue education and awareness raising to local villagers and school children living close to key sites and this may be helped by preparing signboards, posters, T-shirt and school education materials. This should include explaining the dangers of using poison for fishing and for killing unwanted domestic dogs.
- Expand the vulture nest survey to other areas as appropriate.
- Train rangers to identify juvenile vultures and improve data reporting.
- Continue diclofenac surveys.
- Review equipment needs for each site
- Law enforcement teams should take strong action against illegal activities especially use of poison in rivers and ponds to catch fish.

### **XIV. ACKNOWLEDGEMENTS**

The Cambodia Vulture Conservation Project thanks all its partners for their contributions, including the Royal Cambodian Government Ministry of Agriculture, Forestry and Fisheries and Ministry of Environment, the Wildlife Conservation Society, the Angkor Centre for Conservation of Biodiversity, BirdLife International, the Worldwide Fund for Nature and the Royal Society for the Protection of Birds. The Project thanks the Disney Wildlife Conservation Fund, the Global Environment Facility – United Nations Development Program, the Angkor Centre for Conservation of Biodiversity and the Critical Ecosystem Partnership Fund and BirdLife International in Indochina for their support. The Critical Ecosystem Partnership Fund is a joint initiative of l'Agence Française de Développement, Conservation International, the Global Environment Facility, the Government of Japan, the MacArthur Foundation and the World Bank. A fundamental goal is to ensure civil society is engaged in biodiversity conservation

### **XV. GLOSSARY AND ABBREVIATIONS**

ACCB	Angkor Centre for Conservation of Biodiversity
Ad	Adult
CNV	Cinereous Vulture
CVCP	Cambodian Vulture Conservation Project
DAH	Department of Animal Health
DNA	Deoxyribonucleic acid
FA	Forestry Administration
GB	<i>Gyps bengalensis</i> (code used for some marked birds)
GDANCP	General Department Administration of Nature Conservation Protection
HMV	Himalayan Griffon
IBA	Important Bird Area
Juv	Juvenile

KPWS	Kulen Promtep Wildlife Sanctuary
LWS	Lumphat Wildlife Sanctuary
MAFF	Ministry of Agriculture, Forestry and Fisheries
MoE	Ministry of Environment
MPF	Mondulkiri Protected Forest
NGO	Non-governmental organisation
NA	Not active
NP	National Park
PPWS	Phnom Prich Wildlife Sanctuary
PVPF	Preah Vihear Protected Forest
RHV	Red-headed Vulture
RSPB	Royal Society for the Protection of Birds
SBCA	Seima Biodiversity Conservation Area
SBV	Slender-billed Vulture
SWA	Srepok Wilderness Area (now MPF)
USA	United States of America
UTM	Universal Transverse Mercator
WCS	Wildlife Conservation Society
WRV	White-rumped Vulture
WSP	Western Siempang
WWF	Worldwide Fund for Nature

## XVI. References

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