

INTERVIEW SURVEYS ABOUT

HORNBILLS IN KINABATANGAN





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Executive Summary

Interview surveys were conducted in 2009 and 2010 in the Lower Kinabatangan Wildlife Sanctuary to better understand the perception of local communities towards the presence of hornbills. Several perceptions prevail from these interviews:

- The local community is relatively familiar with hornbills and their general perception is rather positive, although conflicts have arisen with some orchard owners.
- The most common species reported are the Pied hornbill (close to the villages) and the Rhinoceros hornbill (mostly sighted along the river banks or flying above the river).
- More species are observed in the lower parts of the floodplain, in areas where forest patches (Lots 1 to 4) are in better condition, compared to the upper parts (Lots 7 to 10).
- Sightings of large species such as Helmeted, Wrinkled and Wreated hornbills have been declining fast over the past few years. Local informants attribute this to the destruction of large trees that were used as nesting sites, the diminution of food supplies as well as the general degradation of the environment in Kinabatangan.

The results of these interview surveys confirm the perception of a general decline of several iconic large hornbill species in Kinabatangan, such as the Helmeted, the Wrinkled and the Wreathed hornbills.

To better understand and to halt this general decline, follow-up activities may include:

- Performing detailed ecological surveys to locate key areas for the birds that need enhanced protection (feeding grounds, nesting areas, etc)
- Assessing abundance
- Implementing a thorough awareness program with local community members and oil palm plantation workers to raise awareness about the protected status of the birds
- Initiating an artificial nest box program to be implemented by community members

Project background

Eight hornbill species occur in Borneo (see list below) and all of these are still found in the Lower Kinabatangan floodplain, Sabah, Malaysia. The status and the recent trends of hornbill populations in the region are largely unknown. We can however assume that rapid landscape changes such as habitat degradation and fragmentation caused by timber extraction, forest conversion to agriculture, human penetration and other destructive human activities may have resulted in recent and/or drastic population declines.

•	Helmeted hornbill (HH)	<i>Rhinoplax vigil</i> Near Threatened- Conservation Dependent. CITES I
•	Rhinoceros hornbill (RH)	<i>Buceros rhinoceros</i> Near Threatened- Conservation Dependent. CITES II
•	Wrinkled hornbill (WRH)	Aceros corrugates Near Threatened- Conservation Dependent. CITES II
•	Wreathed hornbill (WTH)	<i>Rhyticeros undulates</i> Not globally threatened. CITES II
•	Bushy-crested hornbill (BCH)	<i>Anorrhinus galeritus</i> Not globally threatened. CITES II
•	White crowned hornbill (WCH)	<i>Berenicornis comatus</i> Near Threatened- Conservation Dependent. CITES II
•	Oriental pied hornbill (OPH)	Anthracoceros albirostris Not globally threatened. CITES II
•	Black hornbill (BH)	Anthracoceros malayanus Near Threatened- Conservation Dependent. CITES II

Several on-site visits and discussions between the "Kinabatangan Orang-utan Conservation Program" (KOCP); Chester Zoo (UK) and Woodland Park Zoo (WPZ - USA) were organized prior to the design and initiation of this project. In 2009, we decided to collect scientific data that would assess the conservation needs for this project. The first step of the strategy was to collect secondary data through interview of local community members to learn more about the current status of the hornbills in Kinabatangan and about the general perception of the community about these species. This report presents the results of the interview surveys as well as field notes originating from KOCP direct observations where relevant.

Project goal and objectives

The primary goal of this project was to use local environmental knowledge for collecting information about the status of hornbill populations in Kinabatangan. By organizing interviews with members from local communities, we pursued three major objectives:

- 1. To raise awareness about the ecological function of these birds and about the need to preserve them.
- 2. To determine how to build effective and local conservation efforts to support the species of concern.
- 3. To learn more about the current status of the Kinabatangan hornbill populations by using local environmental knowledge.



Project activities

- 1. Produce a brochure about hornbills. This brochure was used during interviews for identifying hornbills species.
- 2. Conduct interview surveys with members of local communities to acquire historical and current information concerning the eight species of hornbills occurring in Kinabatangan.
- 3. Use brochures and posters in various education programs to build local awareness about hornbills.
- 4. Consult with KOCP's partners to assess potential conservation efforts that may need to be undertaken for species of concern (e.g. creation of artificial nest boxes; ecological surveys; implementing awareness campaign; law enforcement; etc).

PRODUCTION OF A BROCHURE

At the beginning of the project, we designed a brochure called "Hornbills of Borneo". Pictures of eight hornbill species were contributed by Cede Prudente, a local professional photographer living in Sabah. A consultation process between the three major partners involved in this project (KOCP; Chester; WPZ) led to the final design and text used in this brochure. This brochure presented the main identification features for each species as well as a brief description of the ecological function of the birds. The English version was translated in *Bahasa Malayia* by KOCP and two sets were finally produced. A total of 5000 doublesided brochures were printed in Sabah, using waterproof paper (Figure 1).



Figure 1: Brochure "Hornbills of Borneo" produced at the beginning of the project

INTERVIEW SURVEYS

Interview surveys were conducted in 2009/2010 in seven major villages bordering the Lower Kinabatangan Wildlife Sanctuary (see Map 1).

These interviews were conducted by the KOCP Honorary Wildlife Wardens (HWW) (Azrie Sawang; Berjaya Elahan; Haslan Saidal; Mulyono Mulasi) and the GIS Officer (Eddie Ahmad). They consisted in a combination of structured and unstructured interviews through individual and small group discussions. Informants were generally very cooperative and inclined to share their knowledge with interviewers. The sessions began with the presentation of the brochure and the characteristics of the different species of hornbills. During the general discussion that would follow, the different points of the questionnaire were discussed more in detail.

The questionnaire aimed at first testing interviewer's general knowledge about hornbills, and then at investigating interviewer's perceived feeling about presence and abundance of the birds in village areas and forests, threat identification, possible use of hornbills, presence of possible conflicts and any stories or local tales involving hornbills, etc (see Annex 1 for the list of interview questions).



Map 1: Location of the seven villages sampled during the interview surveys in Lower Kinabatangan



Eddie Ahmad conducting interview with Jalong from Kg Abai.

Azrie Sawang (Head of the HWW) conducting interview with Jamal, Kg Abai village head.



MAJOR RESULTS OF THE INTERVIEW SURVEYS

Data presented in this report originated from 69 interviews conducted during the surveys: 8 women and 61 men (see Table 1). Informants were aged between 20 and 80 years old: 16.2% were between 20 and 30 years old; 27.9% between 30 and 40 years; 27.9% between 40 and 50; 11.7% between 50 and 60 years; 16.2% were more than 60 years old. During their regular daily activities, most of the infomants spent a considerable amount of time on the river (23% were fishermen and 25% were involved with tourism activities, which mainly consist of boat cruises in Kinabatangan). Approximately half of the interviewees rarely entered the forest while the other half spent time in the forest (more than 100 m from the river bank) on a regular basis for various reasons.

	Informants	Fishermen	Tourism	Other	<100m	>100m
Abai	13 (11; 2)	7	2	4	11	2
Sukau	19 (19; 0)	3	10	6	5	14
Bilit	11 (11; 0)	3	5	3	3	8
Gomantong Jaya	8 (7; 1)	0	0	8	4	4
Suan Lamba	3 (3; 0)	2	0	1	0	3
Bukit Garam	9 (7; 2)	1	0	8	2	6
Lokan	6 (3; 3)	0	0	3	6	0

Table 1: Number, major occupation and usual average forest penetration distance by the informants interviewed in each village

Rhinoceros (RH) and Oriental Pied (OPH) hornbills were the only two species that have been observed at all sampled locations. OPH were commonly seen close-to or in-the-middle-of villages; it was a regular visitor of orchards/farms. The RH were commonly seen flying over open spaces (villages or rivers) or perching in fruit trees along the river banks in the evening. It is possible that non-experienced informants misidentified the RH with other large hornbills, resulting in the overestimation of RH sightings. The rarest species throughout the survey area included the largest bird species (HH; BCH; WRH; WTH) as well as the WCH: Table 2.

A total of 44 informants were familiar with the RH. They gave detailed information about this species which appeared to be the most well known in the Kinabatangan. Informants were also familiar with the OPH (n=41) but other species were less well known: the BH was recognized only by 26 informants; followed by the HH (n=22); the BCH and the WRH (n=19); the WCH (n=18); the WTH (n=15).

	RH	HH	BH	ОРН	WCH	BCH	WRH	WTH	> 6 species
Abai (n=13 informants)	85 %	54 %	38%	69%	15%	38%	31%	31%	2 persons
Sukau (n=19)	100%	63%	89%	100%	74%	79%	63%	63%	12 persons
Bilit (n=11)	100%	54%	73%	100%	45%	36%	73%	18%	1 person
Gomantong Jaya (n=8)	37%	0%	25%	50%	12%	0%	0%	0%	None
Suan Lamba (n=3)	100%	0%	33%	66%	0%	0%	0%	0%	None
Bukit Garam (n=9)	44%	22%	22%	78%	0%	11%	11%	0%	None
Lokan (n=6)	50%	0%	0%	100%	0%	17%	0%	0%	None
All villages (n=69)	51 74%	24 35%	32 46%	56 81%	19 28%	23 33%	22 32%	15 22%	15 (22%)

Table 2: Percentage of informants who have seen the different hornbill species(RH: Rhinoceros Hornbill; HH: Helmeted; BH: Black; OPH: Oriental Pied; WCH: White Crowned;BCH: Bushy Crested; WRH: Wrinkled; WTH: Wreathed)

General distribution

All eight hornbill species were only reported in the lower parts of the survey area (Abai, Sukau, Bilit). Two major reasons could account for this finding:

• Tourism activities are widespread in the villages located downriver. Most informants were involved with tourism activities to some extent or were fishermen (Table 1). Therefore, they spend long periods of time on the river, optimizing their chances of sighting birds commonly seen in riparian habitats or flying over the river. Unlike in other villages, the majority of informants in Sukau recognized seven or eight hornbill species during the interviews. This result is explained by a better general awareness

about environment originating from repeated efforts of environmental NGOs in this village (Hutan, WWF, etc) and widespread tourism activities in the area.

• Bukit Garam and Lokan are bordering the upper parts of the Kinabatangan River, and fewer bird species were reported in these villages. In upper Kinabatangan, forest patches are more degraded and fragmented than in the lower parts of the Sanctuary. The general degradation of the forest habitat could explain a lower hornbill diversity in these areas.

Hornbills appeared to be relatively less abundant in Gomantong Jaya despite the proximity of Gomantomg Virgin Jungle Forest Reserve.

The general perception (n=54 persons; 88%) was that hornbills are frequent and easily seen in the region. However, many informants claimed that some species have become more and more difficult to see (HH, WTH, WRH). The OPH was the most commonly seen species followed by RH.

General ecology



The majority of informants (n=85%) believe that hornbills eat fruits. Most people complain that hornbills often feed on fruits from their orchards (durians, mangoosteens, bananas, etc) as well as fruits from oil palm trees. Wild figs are also reported to be a regular food source. Other food items include small snakes or lizards (by HH: n=3 informants); baby birds (n=1); large snails (n=1); worms or caterpillars (n=2).

<u>Field observation</u>: Meat consumption by a wild RH. Hornbills can also eat meat: in October 2009, two KOCP research assistants saw a RH catching, killing and eating a non-identified species of rat along the banks of the Rasang tributary. KOCP field research assistants have also observed OPH predating on young chicks of smaller species (sparrows, etc) that are still in their nests.

Most informants believed that hornbills are present throughout the year, and more so during the fruiting season when the birds feed in orchards. RH were commonly spotted along the river banks although they were also observed flying over oil palm plantations. OPH were also common along the river bank but were seen more and more often in the villages and orchards. Other species were not found close to the villages although they were sometimes spotted while flying over the villages.

Reported group size for HH, WTH and WRH rarely exceeded two or three individuals. For all other species, larger groups were observed: up to 15 individuals for the RH; approximately 10 for BH; up to 20 for the OPH; up to 6 for WCH; up to 20 for BCH.

<u>Field observation</u>: Large flock of RH along the Kinabatangan River. In August 2010, during an evening boat cruise, Marc Ancrenaz spotted a group of 42 RH in a fig tree along Kinabatangan. At the beginning of the observation, the birds were eating fruits. Then, in smaller units, they flew off to another forest patch located a few hundred meters away, allowing for a precise count. Most birds were adult and flying in pairs, although some pairs were accompanied by one or two juveniles (smaller size and small beak horn). The flock was not spotted the next morning. Observations of flocks of up to 20/30 birds have already been reported in the area, but remain occasional. Although it is not established yet whether these birds are resident to Kinabatangan; this unusual large group of RH may be migrants originating from other forest reserves.

Nesting behaviour

A total of 25 informants said that hornbills were using tree holes and tree cavities for nesting. Nests were reported to be built in dead trees (n=3), Laran trees (*Acantocephalus chinensis*) (n=2), Bangkal (*Nauclea sp.*) (n=6); and other species. Most of the species listed by the informants are river-edge pioneer trees with soft wood. All interviewees believed that hornbills needed large trees for nesting and that they cannot build nest in small trees. They also added that most large trees had been harvested in the area over the past few decades, and that nests could only be found deep inside the forest. Therefore, they were difficult to locate. The only notable exception is the OPH that was nesting more and more regularly close or within the villages. No particular breeding season was reported by the informants for any of the eight hornbill species.

<u>Field observation</u>: Nesting event of the OPH. In December 2010, a male OPH started to investigate a tree cavity located about 1.5 m above ground level in a Nauclea tree on the Kinabatangan River, about ten meters away from a couple small buildings (Sabah Forestry HQ). After a few days of work, the couple started to enlarge the inner cavity and the female spent increasing periods of time within. On January 8th, two eggs were found within the nest. The female is currently fed by the male (see pictures below).



Human use

The eight hornbill species are protected in Malaysia. However, six informants claimed that they have killed one or more birds in the past (it was not clear if all events occurred in Kinabatangan). Two people said that they killed hornbills for meat consumption; three to use parts of the bird for traditional medicine, and one because the bird was eating fruits in his orchard.

Several informants claimed that the bones and the beak's horn were still used extensively for traditional medicine. The horn is provides powerful treatment against poisoning. A drink is prepared by throwing tiny pieces of the beak's horn in boiling water. Then the poisoned person drinks it. The cure can be prepared with beak's fragments of various species: RH (n=4 informants); HH (n=3); BH (n=1); OPH (n=1). Better results are achieved when the pieces of

elephant tusk or rhinoceros horn are added to the mixture. The horn of the bird doesn't have to originate from a fresh kill; it can be kept for years (even decades) and stored in a dry cloth without losing its power. Other traditional use include treating diabetes (*kancing manis* or "sweet urine") with the beak of HH (n=1 informant); bad haemorrhagic coughing with bones of RH (n=1), or serious headache (n=3). Feathers and skulls are not used by local people for decoration or for handicraft purposes as it is the case in other ethnic tribes in Borneo.

General bird's perception: tales and legends



In general, the informants appreciated the presence of the birds in their vicinity and were tolerant of the bird's crop raiding activities. Hornbills are part of their ecological and cultural landscape, as shown by a few tales collected during the interviews. Several informants told that the 'laugh' of the HH was indicative of the birth of a child in a village. Some also believe that hanging a beak above the house's door is keeping away the ghosts. However, the beak can also be used to call several kinds of ghosts in some special occasions.

Origin of the Helmeted laugh: a local tale.

Once, an Helmeted hornbill perched on a large tree and started to speak with the tree: "I wouldn't like to be a tree" said the bird. "Look at you, you are big and tall but you cannot move and you cannot visit all the beautiful places that I see when I'm flying".

"You are right, I cannot move" answered the tree. "But unlike you, I'm providing shelter and food to a countless number of animals. And I see things that you cannot see..." "Like what?" asked the curious bird.

"Well, people are using my branches and my timber to build their houses, their boats and other ustensils. With the wood, they are also erecting toilets by the river side and bedrooms in their houses. As a result, I can see their most intimate behavior..... but you cannot!" "This is true" said the bird, and he started to laugh very loudly: "Ka..... Ka......Ka.....

KaKakakakakakakaaaaa" before flying away from the tree.

PUBLIC AWARENESS

The brochure produced at the beginning of the project was distributed freely among community members before the interviews. The document proved to be a very efficient tool for species identification and for promoting intense dialogues and discussions amongst the informants. This brochure was also distributed freely during school education activities organized by HEAP ("Hutan Environmental Awareness Program") and at various conferences organized in Sabah in 2009 and 2010 ("Environmental Day" organized in Sukau; "International Bird Festival" in Sandakan). The remaining brochures are used by HEAP for their regular education campaign.



<u>Field observation</u>: Evidence of Reproduction events for the Rhinoceros and the Bushy crested hornbills in Sukau. A couple of adult RH are regularly seen in the small patch of forest (5 ha) bordering the KOCP HQ in Sukau. In November 2010, the couple were seen flying with a bird so young that it was barely able to keep up with the adults. This bird was still fed occasionally by the parents. Since then, the pair and the young have been regularly spotted in the area (last direct sighting: early February 2011). This observation shows that this pair of RH can successfully breed in the vicinity of Sukau village. However, the nesting site has yet to be localized. Over the past few years, a group of Bushy Crested hornbills is regularly spotted at the same site (KOCP HQ in Sukau). This group includes a pair of adult birds with three to seven younger individuals (smaller bill). These two large species of hornbills show signs of active reproduction in Sukau area.

Conclusions and further actions

The results of these interviews give a general indication about hornbill populations in lower Kinabatangan:

- Hornbills were relatively well known by most members of local communities. The general perception by the public is rather positive, although conflicts do occur with some orchard owners.
- The most common species reported by the informants were the Pied hornbill (close to the villages) and the Rhinoceros hornbill (mostly sighted along the river banks or flying above the river).
- More species were spotted in the lower parts of the floodplain in areas where forest patches (Lots 1 to 4) are in better condition compared to the upper parts (Lots 7 to 10).
- A few decades ago, before forest conversion reached peak levels, hornbills were heard regularly but seen rarely from the village; they used to remain in the forest, away from people's houses. However with forest fragmentation and reduction, direct hornbill sightings have increased over the past 20 to 30 years. However, most informants indicated that sightings of larger species are now becoming rare, indicating a possible decline of hornbill numbers in Kinabatangan (especially HH, WRH and WTH). Local informants attribute this decline to the destruction of large trees that were used as nesting sites, the diminution of food supplies as well as the general degradation of the environment in Kinabatangan.

The results of these interview surveys confirm the perception of a general decline of several iconic large hornbill species in Kinabatangan, such as the Helmeted, the Wrinkled and the Wreathed hornbills.

The decline can be due to several factors:

- **Hunting**: hunting pressure from local community members appeared to be low. In addition, large species that are usually found some distance away from the villages where hunting pressure is expected to be lower are declining the most. However, we cannot rule out the possibilities for some birds to be shot or caught by outsiders living in nearby oil palm plantations.
- **Capture for pet trade**: the pet trade is a common threat in Asia. However, the Kinabatangan floodplain is currently unaffected by this.

- Lack of food resources: although forests in Kinabatangan are highly degraded and fragmented, they support an amazing abundance and diversity of wildlife. Previous KOCP studies have showed that plant communities are still diverse and highly productive in the Sanctuary, providing regular food supplies to different guilds of frugivorous animals. It seems thus unlikely that a shortage of food resources alone can explain the decline of large hornbill species.
- Lack of nesting sites: large hornbill species need large cavities only found in large, mature. During the past 30 years, aggressive logging and forest conversion to agriculture has resulted in the destruction of all emergent trees. Until today, the mortality of the few remaining larger trees found in Kinabatangan is still very high. Indeed, many of these trees were damaged during past logging operations or standing alone without the buffer offered by other trees against climatic and wind conditions. As a result, large trees that could provide suitable nesting sites to large hornbill species in Kinabatangan have became rare during the last twenty years or so.

Hornbills are a major asset for the tourism industry in the Kinabatangan Wildlife Sanctuary. They also play a key role in forest eclogy through seeds dispersal. All species are long-live and slow breeding. Therefore, low recruitment due to the absence of suitable nesting sites will take time before being apparent. There is an urgent need for the discussion and implementation of follow-up and management activities to improve the current situation. These could include:

- Performing detailed ecological surveys to locate key areas for the birds that need enhance protection (feeding grounds, nesting areas, etc)
- Assessing abundance and identifying areas that are keys for maintaining the birds
- Implementing a thorough awareness program with local community members and oil palm plantation workers to raise awareness about the protected status of the birds
- Initiating an artificial nest box program to be be implemented by community members





ANNEX 1: LIST OF QUESTIONS ASKED DURING INTERVIEW SURVEYS

A total of 21 questions were selected for the interview surveys. They were asked with no preestablished order during the general conversation that was initiated between the informant(s) and the interviewer(s).

I. Socio-economic data: Age, sex, major occupation, family size

II.	Use of the forest:	Do you enter the forest? When – Where – Why – How far inside?
III.	Hornbill presence:	Have you already seen hornbills? What species? Where? When? How many of them?
IV.	Nesting behavior:	Have you already seen a Hornbill nest? Where? Describe? Could you show us a nest? When do you think that hornbills are nesting?
V.	Feeding behaviour:	Do you know what hornbiulls are eating? Do they eat and damage your crops? When? Where? What?
VI.	Other uses:	Do you hunt hornbills? Why? Do you use any part of the birds for traditional medecine?
VII.	Additional information:	Do you have any other comments? Do you know of any tale/legend about hornbills? Do you like these birds?



In 2010, KOCP activities were supported by the following partners:

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