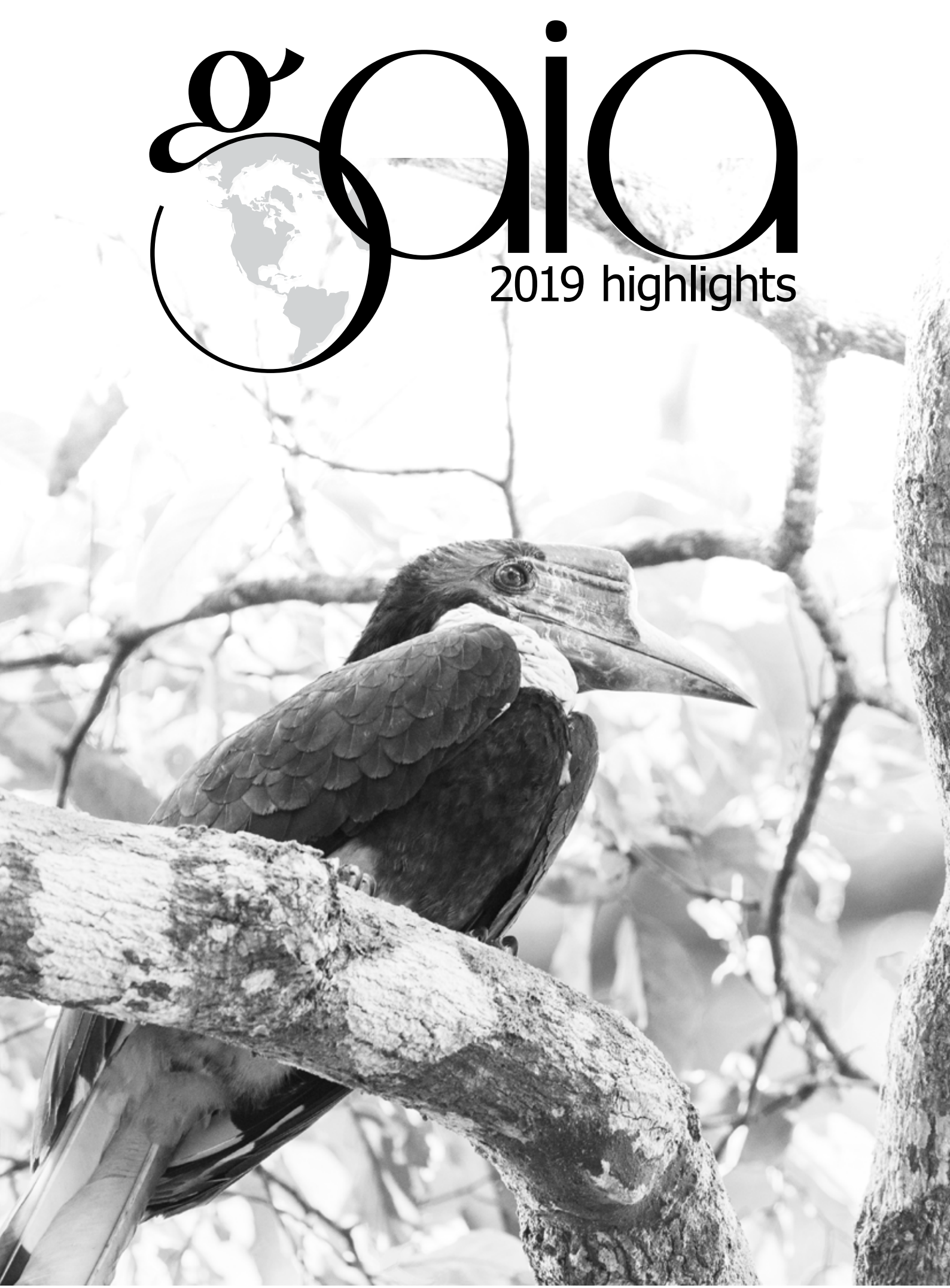
gaia

2019 highlights



* this document is sent privately to you and no part should be distributed via any media due confidential content

WHO WE ARE.

Gaia is a Malaysian social enterprise set up in 2015 by Ravinder Kaur (PhD candidate at University Malaya in the field of Ecology) and Sanjitpaal Singh (International award winning photographer). Gaia is dedicated to increasing scientific knowledge, implementing conservation actions and creating awareness on wildlife in Malaysia. Currently the team is focused on hornbill conservation in the Kinabatangan, Borneo. Since its establishment, the research team have been searching for natural nesting sites of hornbills, monitoring and protecting active nests and developing appropriate nest box designs.

Gaia partners with HUTAN Kinabatangan Orang-utan Conservation Program, a French Non-Governmental Organization, led by Dr. Isabelle Lackman, and Dr. Marc Ancrenaz. HUTAN/KOCP was established in 1998 with the Sabah Wildlife Department (SWD).

https://www.xploregaia.com
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https://www.hutan.org.my/

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January

The AGM

The year kicked off with the HUTAN AGM. The Gaia hornbill team was invited to present their work in 2018 in this AGM. One of our favourite times of the year, as we not only share our achievements but get to see other achievements in HUTAN, all in the name of nature and wildlife conservation. This was also a significant year as it was the 20th anniversary of HUTAN.

February

Discovery: Bee invasion

With over 20 artificial nest boxes build and installed in the forest, its imperative to maintain and check on the condition of these boxes. On one of the climbs to check on the artificial nest box, the team discovered a colony of stingless bees.

Though this is not the target species, this is an encouraging sign because other studies have shown that stingless bees prefer to nest in cavities of living trees. Hence, our artificial nest boxes are offering a similar internal condition of a natural tree cavity.

March

International Zoo's visit

Every year, we welcome our key funders and partners to come together and create artificial nest boxes that mimic the natural conditions of a natural cavity. We also aim to get more hornbill species interested in these nest boxes. So far, the artificial nest boxes of phase one, pioneered by HUTAN, Chester Zoo and Beauval Zoo have managed to attract Rhinoceros hornbills, Oriental Pied hornbills and Bushy crested hornbills to nest in these artificial structures. In phase two, we have trialed many more designs and we have also been seeing many more visits by Wrinkled hornbills.

During this 2019 visit, a plan had been put into place, to secure an artificial nest box next to the dying nest tree of the critically endangered Helmeted hornbill. The pair had used the nest tree since 2013, but the Shorea pauciflora tree had been showing signs of decay.

Due to the terrain and weight of the nest box materials, the whole activity had to take two days to complete. Transporting the nest box through the forest almost 2 kilometres away was indeed challenging but the team managed to complete the task at hand. The next day, HUTAN's expert climber Eddie and Ahmad climbed 35m high to install the artificial nest box for the Helmeted hornbills. The team came together to hoist the box up and it was installed 30m high on a 50m tall tree.

April
Talks: All about hornbills
As part of our efforts to increase awareness and knowledge about Malaysian hornbill species and the critically endangered Helmeted hornbill, we conducted public talk in the heart of Kuala Lumpur to corporates and the general public.

May
Discovery: Bushy nesting in box
Several nest boxes from phase one that were installed in 2013 have become active. We're excited to see Bushy-crested hornbills nesting in them during 2019!

May

Helmeted hornbill nesting

Our one and only nest of the Helmeted hornbill occurs in an old Shorea pauciflora tree. The 50m tree stands magnificently in the forest, but it shows signs of age and is slowly decaying.

When we discovered the return of the Helmeted hornbill pair to nest, we were delighted and the team had a meeting to plan the next 6 months of nest monitoring for these birds take half a year to raise one chick.

Two days each week was dedicated to an eight-hour nest observation activity. The team would hike in the dark for 40 minutes to the nest and set up their scope before the sun rises. This was to ensure the first feed of the day was observed and recorded.

When the time came for the female Helmeted hornbill to leave the nest, followed by the chick, Sanjit our photographer along with Amidi and Helson, begun daily observations that lasted for 43 days. It was physically and mentally challenging for the team, to hike daily with heavy equipment and patiently wait for the chick to leave the nest.

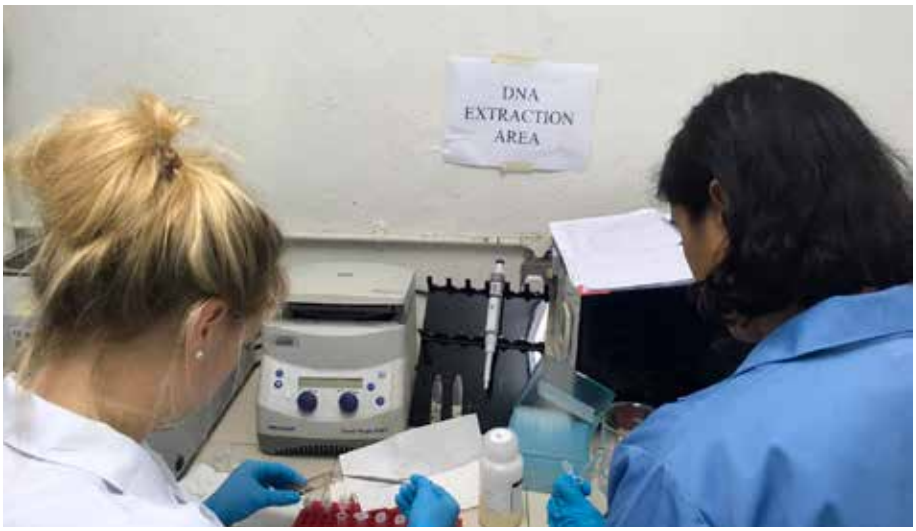
Alas, this time things unfolded very different. It started with the team coming across things that was amiss in this totally protected forest. It was the disturbing smell of cigarettes and campfires that meant the presence of intruders. Then on 18th Oct, the female Helmeted hornbill had vanished.

On one fateful day, during nest observations, the team came face to face with two intruders. They were armed and they fired warning shots. After reporting this to the authorities and obtaining help from Malaysian special forces, the team was faced with an important decision. To forgo observations or to continue as the intruders still remained at large. The nesting helmeted hornbills were extremely vulnerable at this moment and after observing this pair since 2013, these birds were family. So, HUTAN/KOCP and Gaia decided to form a bigger team together, to continue the daily

observations in hopes to protect the two remaining members of the Helmeted hornbill family.

The team visited the nest on a daily basis until the chick fledged on 02nd December. The team also returned the following day to make sure the male Helmeted hornbill and its chick had indeed moved away. The bravery of the team had helped keep at least the two remaining Helmeted hornbills safe from harm.

May
Discovery: New hornbill nest
New Bushy crested hornbill nest discovered and monitoring is scheduled to begin in 2020.



June
New activity: DNA
We are always open to collaborate with others and we recently worked with a PhD student from University of Hong Kong. She is extracting DNA from both living and preserved specimen of Helmeted hornbills. We helped her collect feces from a nesting pair of hornbills and in return, she kindly taught us the methods of sample collection and DNA extractions. A big thank you to University Malaya and Dr Lucas Low Van Lun for the opportunity to use the laboratory.

June
Expedition: Tabin

Under the generous funding by Rufford Foundation, HUTAN and Gaia team searched for hornbill nests in Tabin Wildlife Reserve. The team discovered one Wreathed hornbill nest and they also conducted a presentation to the resort owners, guides and visitors after dinner.

June
Discovery: Nest invader

June 15th – Remember that two day ordeal that the team went through to put up a nest box for the Helmeted hornbills? Well, it was taken over by a Red giant flying squirrel. Though not our target species, we're happy to see them use this cavity. Cavity nesters are really facing a big challenge at the moment, to find suitable tree cavities in the logged over forests of Kinabatangan.

June
Plant Nursery

June 23rd – A dedicated hornbill plant nursery is set up thanks to the local community and the generous funding by Rufford Foundation. This was a pilot study, to see how well regurgitated seeds collected from the base of hornbill nest trees would germinate. 270 plants were grown from seeds in six months! With the help of HUTAN's reforestation team, these key plants will be transferred to degraded parts of the forest.

July

Presentation: ICCB

Thanks to the support of Conservation Leadership Program, the team could participate and present a poster on the project's success at the International Congress for Conservation Biology (ICCB 2019) in Kuala Lumpur.

HUTAN
Kinabatangan Orang-utan Conservation Programme

gaia

natural nest cavity **restoration** & its proven **results** for **hornbills** in **Borneo**, Malaysia

Hornbills are cavity-nesting birds but they are unable to create cavities on their own. They rely on naturally formed cavities that occur in trees through fungal infections or other excavators such as woodpeckers.

In the Kinabatangan, Borneo, the team have located many cavities that occur in smaller trees, and these cavities are ideal for smaller bodied hornbills. However these cavities have a short lifespan and can deteriorate easily over time. Suitable cavities are also in high demand, and hornbills face competition among themselves as well as with other animals such as wasps.

The lack of tree cavities due to logging and agriculture expansion make it difficult for hornbills to find a suitable nest. Hence, two conservation initiatives are taken:

1) The introduction of artificial nest boxes for large bodied hornbills.
2) The restoration of natural cavities of smaller bodied hornbills. The known cavities were restored by using sawdust and soil to raise the floor and chisel to raise the roof.

by:
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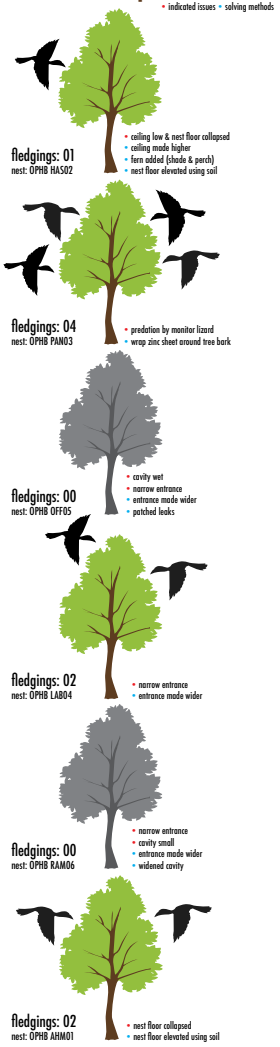
3 YEARS
6 RESTORED cavities
9 FLEDGLINGS
oriental pied hornbills

• indicated issues • solving methods



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July

International: CLP Visit

On July 28th, the Conservation Leadership Program team came to visit our project site and several nesting hornbills.

July:

International: Talarak Visit

29th July – The team hosted Dr. Dino and his partner from Talarak Foundation, Philippines. They were given a personalized tour of the Kinabatangan and the artificial nest boxes. They were keen to learn more about our nest box designs, which we were happy to share.

August

Discovery: RHB Nesting

19th August – an old Rhinoceros hornbill nest becomes active again after several years of being abandoned.

August

Talks: Superbikes

25th August - It's not everyday one gives a talk about hornbills and conservation to a group of local superbike enthusiasts. Sanjit led the talk and captivated his audience with his humour and stellar photos.

August

Talks: Borneo Eco Lodge

26th August – Ravin presented a talk at Borneo Eco Lodge. Gaia has formed a good working relationship with this local lodge and hopes the partnership brings people closer to nature and interested in conservation efforts.

August

Discovery: Sabah Forestry

28th August – We love ficus trees cause hornbills love eating them. We are always trying to find a way to germinate their seeds and for this year, we provided hornbill feces that are full of tiny fig seeds to the Sabah Forestry Department, Ms. Rebecca, for their assistance to germinate the seeds. Alas, none of the seeds germinated and we hope to try again in 2020.

September

International: Borneo Conservation Trust Japan

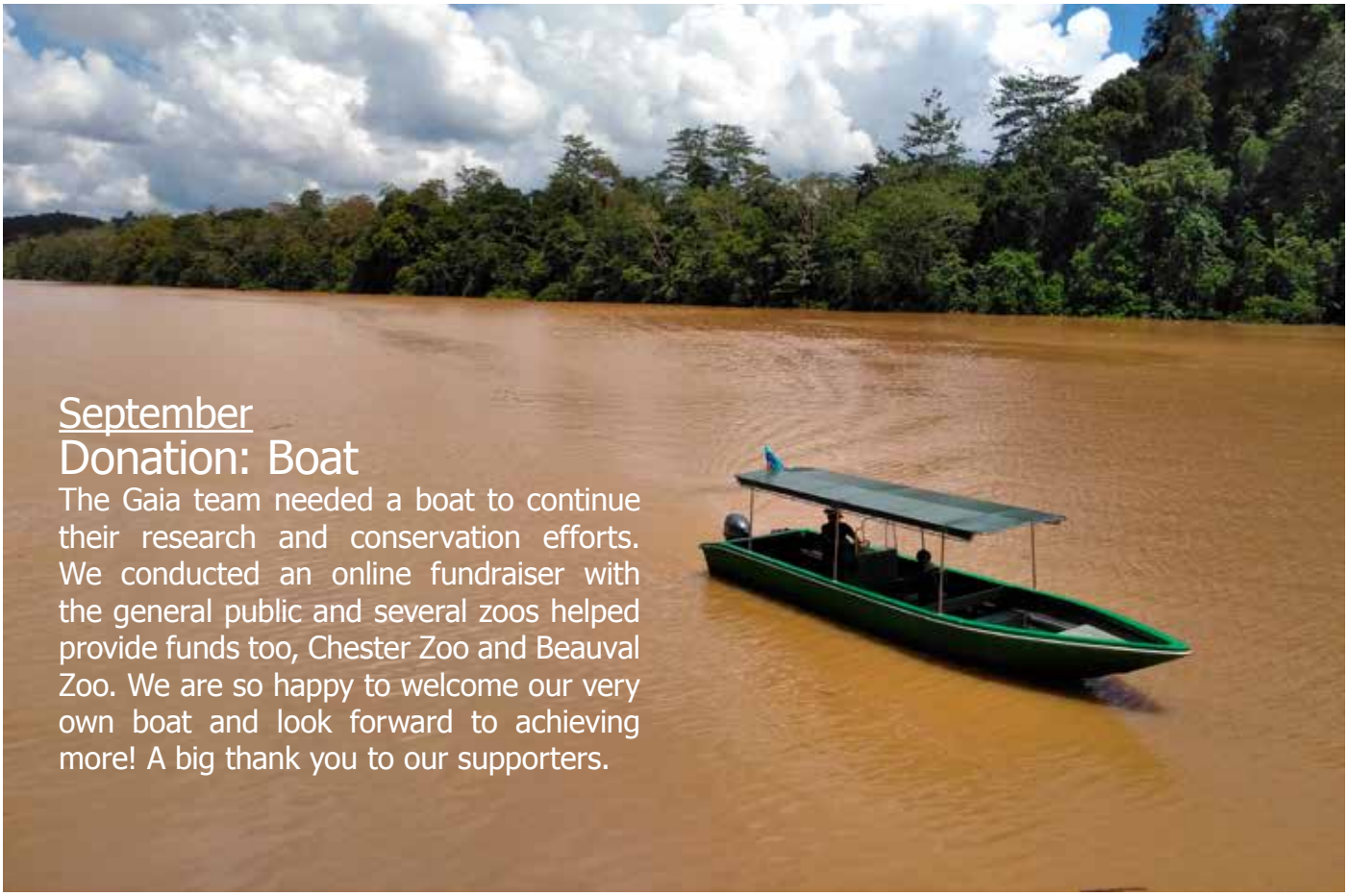
September 26th – The team spent 3 days with Japanese representatives from Borneo Conservation Trust Japan. Thanks to their continued funding obtained from Suntory Japan, together we managed to build and later set up three nest boxes in three days with HUTAN/KOCP!

September
Discovery: New nest

September 27th – An exciting moment for the team indeed as a new Rhinoceros hornbill nest was located. The team has become very accustom to the calls of the chicks. During this particular nest search survey, the team used their sense of hearing to locate the incessant calls of the Rhinoceros hornbill chick.

September
Nest box chick fledges

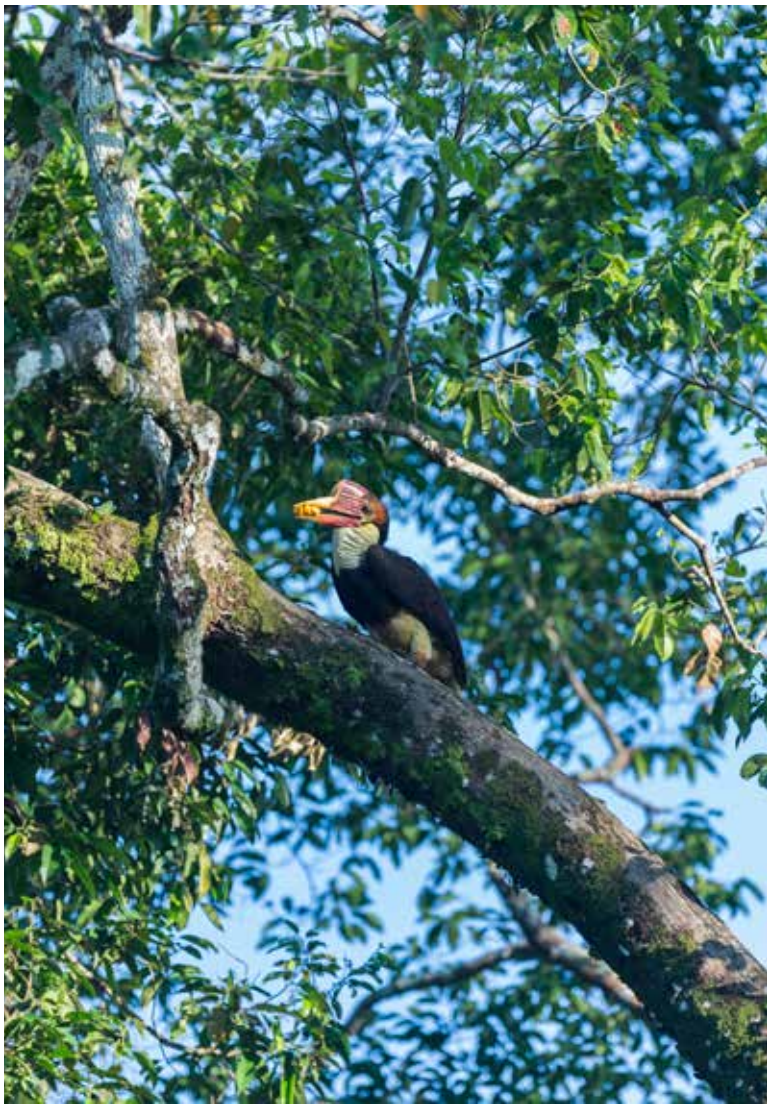
September 29th – We witness a baby Rhinoceros hornbill fledge from the phase one nest box that was set up by HUTAN/ KOCP, Chester Zoo and Beauval Zoo in 2013. It took the Gaia team three years to try capture this important event on camera. This represents the third baby to fledge from this particular artificial nest box. Two more Rhinoceros hornbill chicks have fledged from another artificial nest box too. Therefore, since 2017, there have been five Rhinoceros hornbill chicks in total, to hatch and fledge from artificial nest boxes in Borneo.



September

Donation: Boat

The Gaia team needed a boat to continue their research and conservation efforts. We conducted an online fundraiser with the general public and several zoos helped provide funds too, Chester Zoo and Beauval Zoo. We are so happy to welcome our very own boat and look forward to achieving more! A big thank you to our supporters.



September

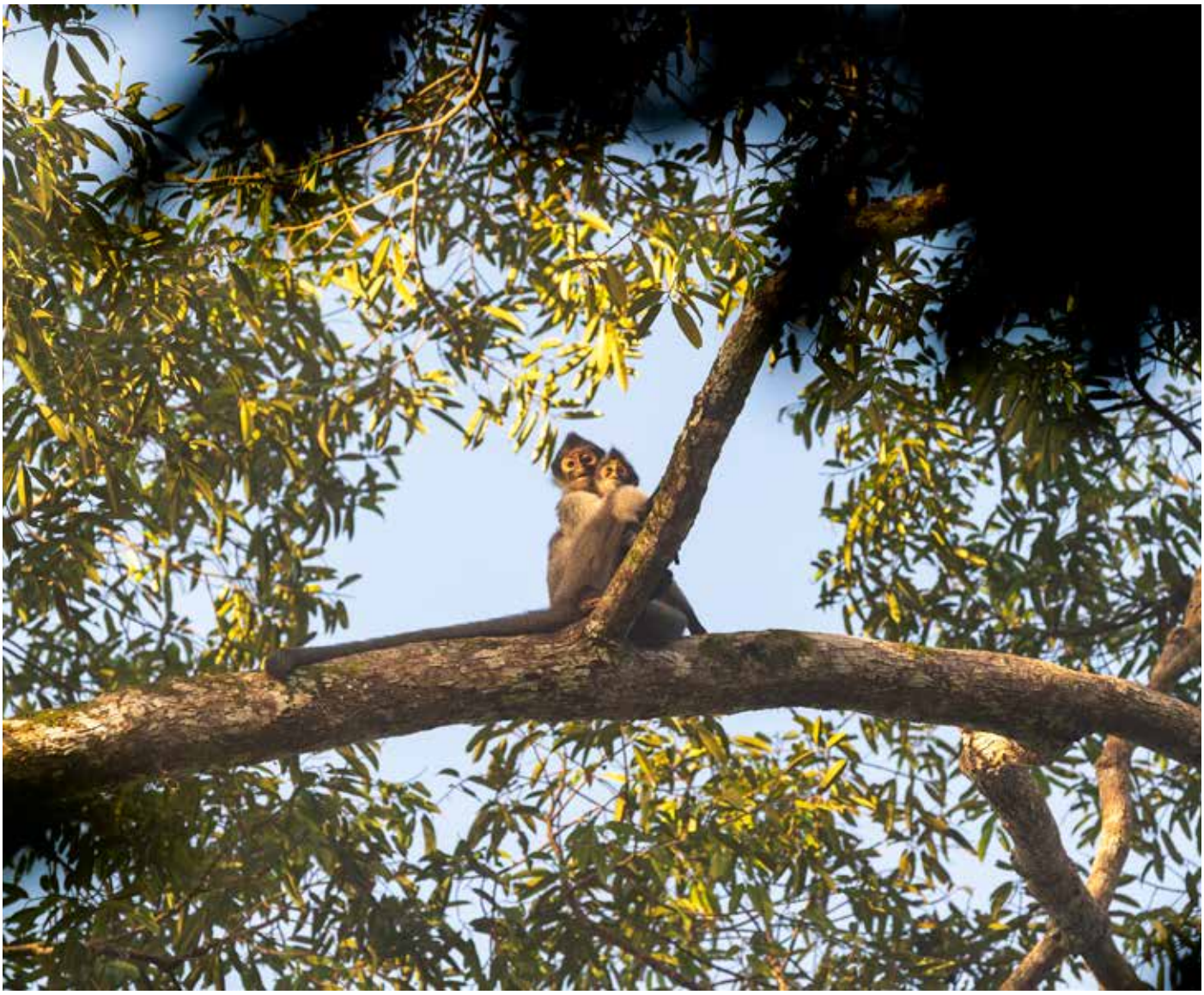
Helmeted hornbill female

September 30th – female Helmeted hornbill left the nest. It was last seen on a fig tree close to the nest on 17th October and then vanished while its chick was still in the nest. The adult male took care of the chick until the chick fledged on 02nd December.

October

Activity: Box Maintenance

October 07th – We carried out box maintenance and perch preparation. Based on camera trap footages, we found that hornbills needed a perch built on the artificial nest boxes to help them perch comfortably. Therefore, we dedicate some time each year to check and maintain nest boxes.



October

Discovery: Sabah Gray langur

24th October – a troop of Sabah Gray langurs were spotted by the hornbill team. The troop of this illusive Bornean primate consists of 5-6 individuals including 1 baby.

November

Discovery: Wrinkled hornbill in large group

November 16th - The team witnessed 37 Wrinkled hornbills crossing the river and feeding on fig trees while accompanying by Ms Heidi from St Louis zoo during an evening boatride. Within this group, there were also young wrinkled hornbills.

November
Activity: PGA Visit

PGA (special armed forces) visit to research site fully armed to conduct training with wildlife wardens and scientific researchers.

December
Activity: Nest box

December 02nd – Two nest box sponsored by Borneo Eco Resort. Thank you for your continued support!

December

Dicovery: HHB

December 05th – Four Helmeted hornbills seen. This is a rare occurrence in Kinabatangan.

December

Activity: Capacity building

Conservation work helps provide local people with a steady job and an opportunity to learn new skills. Our youngest teammate Amidi has not been exposed to computers. Therefore, it's important to build the capacity of the team, by exposing them to new and different tasks. Here Amidi is learning how to use Microsoft excel. For 2020, we hope to purchase a laptop for each person in order for him or her to work independently and improve his or her computer literacy.

Publications

FORKTAIL 34 (2018): 68–73

Observations at a nest of Helmeted Hornbill *Rhinoplax vigil* in Borneo, Malaysia

RAVINDER KAUR, SANJITPAAL SINGH, ROSLI RAMLI, HELSON HASSAN, AMIDI MAJINUN, MARC ANCRENAZ, MAHATHIR RATAG, HISHAMUDDIN ABDUL RAUF, JOHARI JAMAL, AHMAD SHUKRYIEN ABDUL RAUF, MOHD DZULEKRAM MOHD YUNUS, MOHD ARNIZAM ARBANI, KAMARUL ASMAR & MUHAMMAD AZRAN AMIR

Little is known about the nesting behaviour of the Helmeted Hornbill *Rhinoplax vigil* because it occurs in low numbers and nests are difficult to locate. The nest cavity is usually high and hidden amidst thick foliage and the cavity's opening is inclined upwards, making it hard to see from the ground. A nesting pair of Helmeted Hornbills was observed in the Kinabatangan Wildlife Sanctuary between 2013 and 2017. We sought to determine the nesting period and associated behaviour, and to identify the type and amount of food provided to the female and chick over the nesting cycle. The nest was located inside the nub of a broken branch of a *Shorea pauciflora* tree, 37 m up on the trunk. The pair began nesting in May, in the drier months, and the single chick fledged in November the same year. The pair and the fledged young stayed together for at least six months. The male made a maximum of 11 visits per day to bring food to the nest midway through the breeding period. Food brought to the nest consisted of mainly figs, including *Ficus stupenda*, *F. benjamina*, *F. stricta* and *F. crassiramea*. The adult Helmeted Hornbills delivered stick insects, beetles and praying mantis, while the chick itself caught and consumed a giant millipede at the nest entrance. The specific fig diet and nest cavity preferences make the species extremely vulnerable to environmental changes caused by logging and agricultural expansion. The added pressure from hunting it for casques may be driving it to extinction. Therefore we recommend that their nests be located and offered protection by local authorities and communities through nest adoption schemes.

INTRODUCTION

The Helmeted Hornbill *Rhinoplax vigil* is the largest Asian hornbill in the family Bucerotidae (Kinnaird & O'Brien 2007). It stands out among the Asian hornbills because of its distinctive calls, solid casque and long central tail-feathers (Plate 1). The species is territorial and it usually occurs in primary forests (Smythies 1981, Wells 1998). The species is classified as Critically Endangered as it is threatened by habitat loss and hunting for its solid keratin casque, which can be carved into decorative articles (Collar 2015, Beastall *et al.* 2016, Krishnasamy *et al.* 2016, BirdLife International 2018).

Disconcertingly little is known about the basic biology and ecology of the species. Nesting occurs during the dry season when conditions inside the nest cavity are suitably dry (Poonswad 1995, Utoyo *et al.* 2017). Helmeted Hornbills prefer cavities with a protruding entrance that bears its weight and does not damage its long central tail-feathers (Thiensongrusamee *et al.* 2001, Chong 2011, Utoyo *et al.* 2017). In Thailand, birds favour trees at altitudes of 300–800 m with a diameter at breast height of 105–216 cm and a height between 26 and 70 m (Thiensongrusamee *et al.* 2001, Poonswad *et al.* 2013). They nest primarily in trees of the family Dipterocarpaceae, including *Hopea* spp., *Shorea faguetiana*, *S. curtisii* (Thiensongrusamee *et al.* 2001), *Dipterocarpus humeratus* (Utoyo *et al.* 2017) and others such as *Koompassia parviflora* (syn. *K. excelsa*) (Kemp 1995), *Scaphium macropodum* (Thiensongrusamee *et al.* 2001) and *Dysoxylum grande* (Kaur *et al.* 2015). They have one of the longest nesting periods of all the hornbills—between 167 and 172 days (Kinnaird & O'Brien 2007). Hornbills seal their nests to protect the female and chick from strong winds, rain and predators. In a process that can take two weeks, the female Helmeted Hornbill seals herself inside the nest cavity for the majority of the period (Kinnaird & O'Brien 2007, Chong 2011). A pair usually has a single chick (Chong 2011, Kaur *et al.* 2015).

Plate 1. Female Helmeted Hornbill *Rhinoplax vigil* perched at the natural cavity in Lower Kinabatangan Wildlife Sanctuary, Sabah, Malaysian Borneo, 31 October 2017.

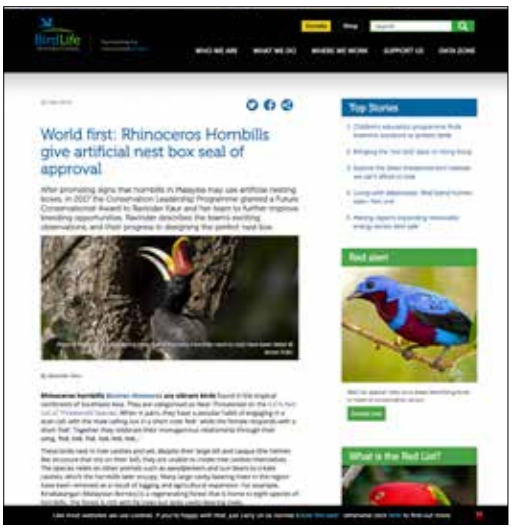
SANJITPAL SINGH

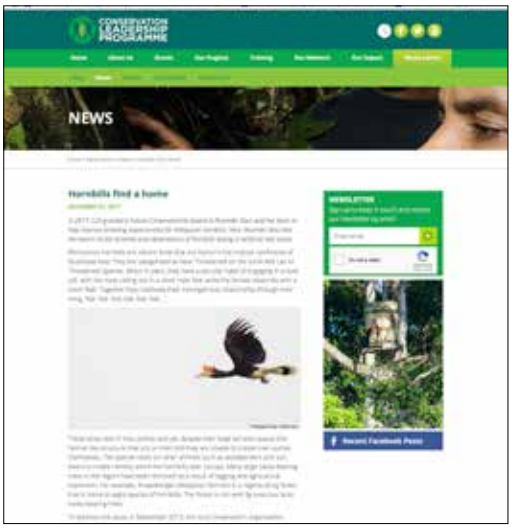
In all seasons figs make up 98–99% of Helmeted Hornbill diets, while the rest is small animals (Hadiprakarsa & Kinnaird 2004, Kinnaird & O'Brien 2007). A diet of figs provides hornbills with calcium, magnesium and fibre while being moderate in sugars, lipids and proteins (Balasubramanian *et al.* 2004, Kinnaird & O'Brien 2007). This diet meets the various needs of the birds, such as calcium for eggs and skeleton growth and amino acids for growth of feathers (Poonswad *et al.* 2004).

Here we add to the limited data about the breeding behaviour and nesting ecology of the Helmeted Hornbill, by reporting our observations at a single nest in Kinabatangan, Sabah, Borneo, between 2013 and 2017. While such information may only bear indirectly on the conservation of the species, it is of value in highlighting the degree of specialisation of this dangerously threatened bird and we hope it will stimulate a greater understanding among wildlife managers responsible for the design and implementation of successful conservation initiatives.

STUDY SITE AND METHODS

The study took place in the 27,960 ha Lower Kinabatangan Wildlife Sanctuary, Sabah. The sanctuary was officially gazetted as a protected area by the Sabah State government in 2005 (Abram *et al.* 2014). The area consists of largely fragmented secondary forests surrounded by extensive oil palm plantations and mills, tracks and roads, villages, orchards and small farms (Ancrenaz *et al.* 2015).





2019 skullduggery

In 2019, we teamed up with a chain of bars & restaurant to create a signature cocktail where proceeds go to conservation of hornbills in sabah.

GET INVOLVED.

- Nest adoption – provide monetary benefits to local communities to guard natural nests from poachers. Alleviate poverty and conserve wildlife.
- Nest hollow restorations – tree hollows can be enhanced or repaired making it nesting suitable.
- Build and set up artificial nest boxes – provide nesting opportunities for hornbills.
- Reforestation – conduct field research on what hornbills consume and propagate those trees in the forest.
- Staff - continued funding support for salaries and insurances.
- Equipment - cameras, laptops, scopes, binoculars, gps, mobile devices.
- Travel costs

WHY WORK WITH US?

We are a team of experts in Science and Arts. Call us for a private presentation to know more about the project and its objectives, goals and activities.

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