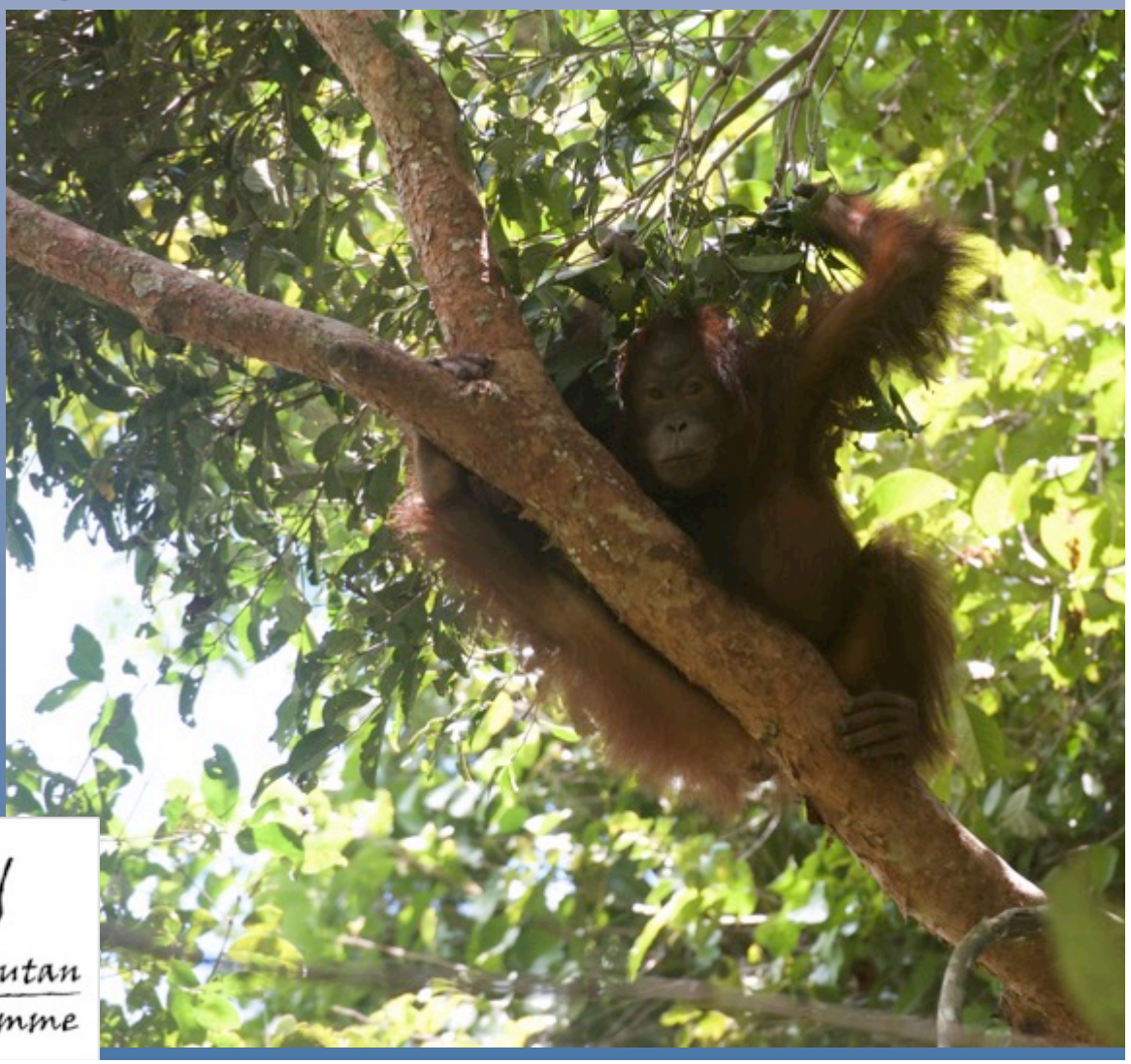
HUTAN

Kinabatangan Orang-utan Conservation Programme

Activity report 2018



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Kinabatangan Orang-utan Conservation Programme

HUTAN has celebrated its 20th year in the Kinabatangan!

For the past 20 years, HUTAN has been working to protect the biodiversity of the Lower Kinabatangan, Sabah, Malaysian Borneo.

We would like to thank all our partners that have made this adventure possible: the State authorities, the local communities, our financial supporters and all the HUTAN field researchers for their dedication and relentless efforts to sustain wildlife and its habitats in Sabah.

Abdul Rajak Bin Saharon - Ahmad Sapie Bin Kapar - Azli Bin Etin - Azman Bin Abdullah - Bahrani Bin Elahan - Berjaya Bin Elahan - Darwis Bin Abdul Mohd - Datu Md.Ahbam Bin Abulani - Dayang Rainah Bte Rahim - Eddie Bin Ahmad - Hamisah Bte Elahan - Hamsiah Bte Marhaban - Hartiman Bin Abd. Rahman - Hasbollah Bin Sinyor - Haslan Bin Saidal - Herman Bin Suali - Mahala Bte Maharan - Mahathir Bin Ratag - Mariana Bte Singgong - Masni Bte Mansor - Misliha Bte Osop - Mohd. Daisah @ Hussein Bin Kapar - Mohd. Faisal Bin Asmara - Noorzeelah Bte Mursalin - Noratika Bte Husir - Norinah Bte Braim - Nurfatihah Bte Jumlin - Rusiman Bin Rukimin - Selamat Bin Suali - Shia Kang Ping Amanda - Sudirman Bin Sawang - Tiawa@Sukmawati Bte Pilit - Waslee Bin Maharan - Jamal @ Jamalludin Sinyor - Ahmad Shukryien Bin Abdul Rauf - Johari Bin Jamal - Johari Bin Junaidi - Fasland Udau - Mohd Arnizam Bin Arbani - Mohammad Hafizuddin Bin Bibong - Labari Bin Abidin - Zulkarnain Bin Jamal - Iqbal Alif Bin Jefrie - Mohd Sufrieyan Bin Jamil - Zulkifli Bin Talua - Mohd Izzat Burhan

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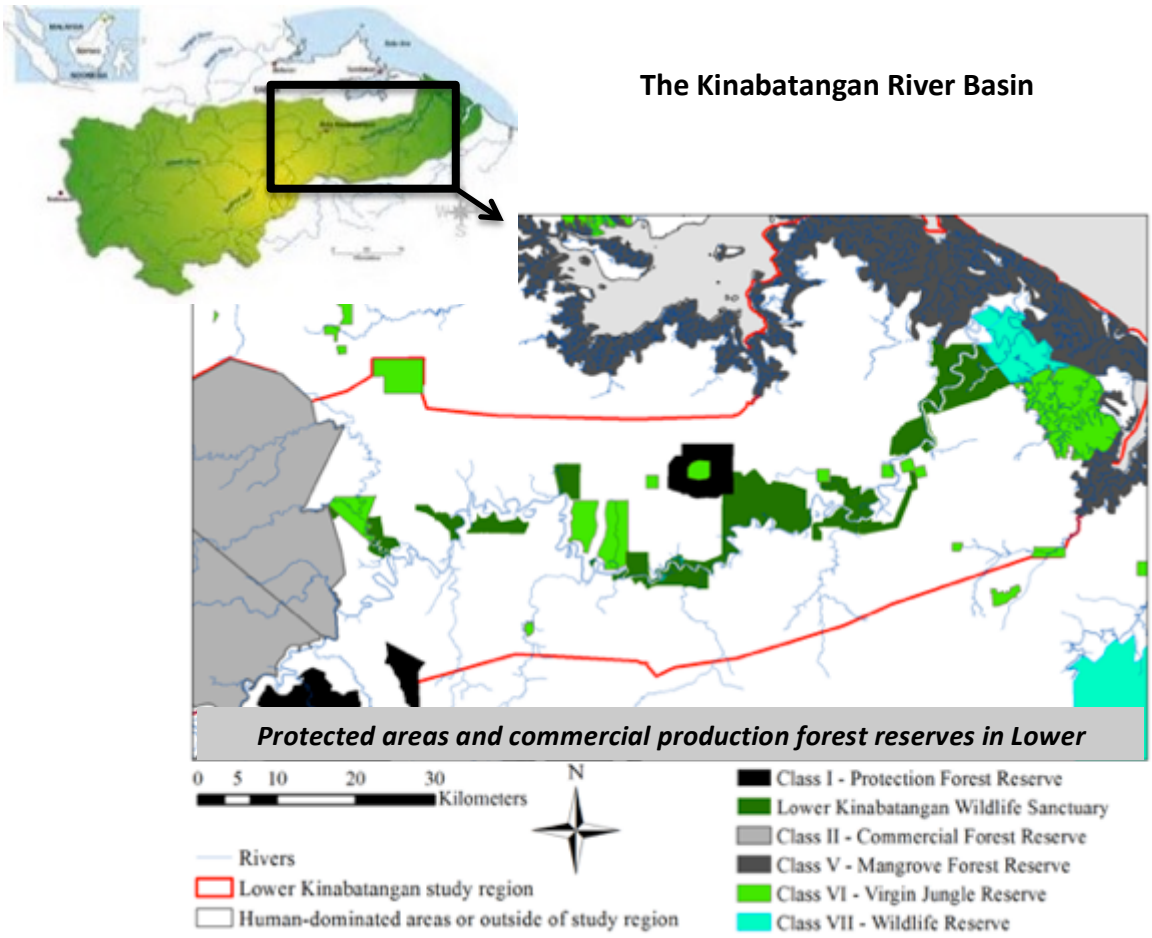
HUTAN is based in Sabah, a Malaysian state located in the northern part of Borneo island. Our primary area of intervention and influence is the lower Kinabatangan floodplain. The lower parts of the floodplain are roughly covered with about 100,000 ha of forests (half being protected) and more than half a million ha of extensive oil palm plantations and man-made landscapes.

The Kinabatangan River Basin

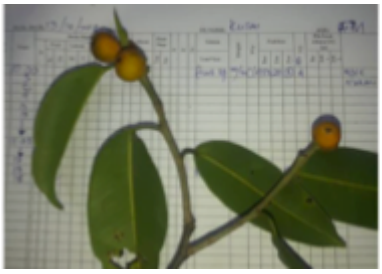


Protected areas and commercial production forest reserves in Lower

The natural forests characteristic of the floodplain include mixed dry lowland dipterocarp, limestone, heath, semi-inundated (seasonally flooded), freshwater swamp, peat swamp, and mangrove forests. This diversity and the relative low traditional hunting pressure have maintained healthy wildlife populations for a long time. However since the 70's, timber exploitation and forest conversion to agriculture has resulted in a drastic collapse of most animal populations in the area. Today, the remaining forests are highly disturbed, degraded, and fragmented. However Kinabatangan remains a "Biodiversity Hotspot", harboring a remarkable diversity and abundance of wildlife, including iconic species, such as the orang-utan, proboscis monkey, Bornean gibbon, Bornean elephant, clouded leopard, sun bear, as well as a wide array of birdlife.

These forests serve also a key strategic function: they are the last link between the mangroves facing the South China sea and the vast block of forests located in the central part of the State, and the last corridor allowing for large-scale wildlife movements in the lowlands of the State.

HUTAN Orang-utan Research Unit: new thinking about orang-utan conservation



In 2018, the Orang Utan Reseach team secured a total of 108 nest-to-nest full days of observations on 21 different wild orang-utans. Overall, fruits dominated the diet of the followed orang-utans (about 2/3 of the diet), and three plant genera accounted for more than 50% of the feeding time: *Ficus sp*., (see picture), *Dracontomelon dao* and *Diospyros sp*.

Over the past 20 years, the teams have collected more than 1.1 million scans (just taking into account the 3 min interval data points collected during full observation days!) on more than 50 wild orang-utans. At our site, the animals spend about half of their active hours (average of 10 hours per day) eating. Lianas and vines are a crucial source of food in Kinabatangan, contributing 34% of the diet of followed orang-utans. Because of the abundance of pioneer plant species, degraded forests offer more widespread and regular food sources than intact forests. At our site fruits still represent about 60% of the diet in average, but orang-utans eat less cambium than in pristine forest. However non-resident males consume more cambium than any other sex-age class, probably because they are unfamiliar with the precise location of other food sources when they are travelling through our study area. Although orang-utans move also more easily in the Kinabatangan forests than in primary forests because of the abundance of climbers allowing for easy horizontal locomotion, their daily travelled distance is about 100 to 200 m in average only.

Our data indicate that resident males have easier female access than non-resident males, but in our study population, both types of males contribute to sire offsprings. We expect that the small size of the forest fragments found in Kinabatangan will create long-term social tension and stress among resident and non-resdient orang-utans, and impact their social organization. Indeed, female orang-utans are philopatric (*ie* they don't disperse when they reach adulthood) and resident females are not tolerant with other unrelated females. Males are the dispersing sex, and they can roam over large distances in pristine habitat before establishing their territory. As a result, we are now investigating how a semi-solitary ape with a diffuse fission-fusion sociality can cope socially with fragmented landscapes.

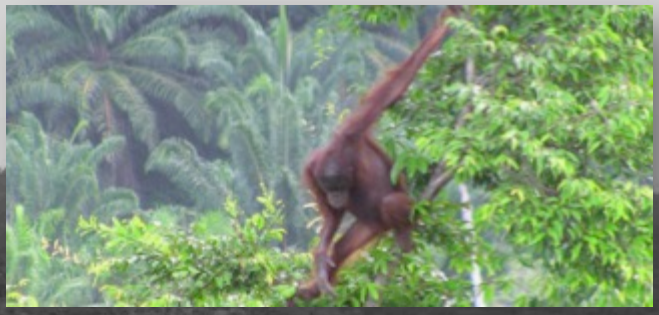
In August, the team located a young orang-utan (about 2 years old) wandering alone in the forest. We searched the forest for her Mum but failed to find her for two days. We eventually captured the baby and entrusted her to Sepilok Orang-utan Rehabilitation Center. In September, we found the carcass of an adult female orang-utan that had been shot and was floating on the Kinabatangan River. The HUTAN Wardens investigated the case, but it was impossible to locate with certainty the precise origin of the killing, and we couldn't identify who was responsible for this murder. It is the first incident of this kind reported in more than ten years in the area. Killing remains the major threat for orang-utan long-term survival in Borneo. Being slow breeders, orang-utans are very sensitive to hunting: a yearly killing rate of more than 1% will lead any population toward extinction.

Our work in agro-industrial landscapes brings new information about orang-utan ecology and adaptability to dynamic landscapes. But more importantly, it also brings new ways to think about orang-utan conservation.

Habitat is species-specific; it describes where a given species lives. It is also a dynamic notion, especially for adaptable species such as the orang-utan that can cope to a certain extent with major changes in its environment. For the longest time, the only habitat suitable to orang-utan was perceived to be untouched primary lowland forests. Over the past twenty years, the cutting edge research led by HUTAN has shown that orang-utans could survive in forests exploited for timber, and today, this production landscape is recognized as an integral part of the orang-utan habitat. ***In fact, the majority of wild populations in Borneo are currently found in degraded forests and in forests that are still exploited for timber.***

The development of commercial agricultural monoculture requires large-scale forest clearing and results in a net habitat loss for the orang-utan. However, our work shows that orang-utans could also be found in acacia or oil palm plantations, and a fraction of these agricultural landscapes is increasingly becoming part of the orang-utan habitat. Indeed, Orang-utans are increasingly using mature oil palm plantations for dispersal (they walk on the ground or move arboreally from frond to frond between the palms), as food sources (they feed on young leaves or ripe fruits) or for resting (they build their nests in the central part of the palm). This of course has a very important impact on our understanding of the dynamic and viability of orang-utan meta-populations. Our current research indicates a differential use of the palms plantations depending on the age/class of the orang-utans:

- ***Resident adult females, immature offspring and occasional adult males that are primarily living in larger forest patches adjacent to oil palm plantations***: these individuals can enlarge their home range by penetrating the plantations and by using some of the resources found there. Being very shy and cryptic, they are often not detected by people. These incursions are generally short (from half an hour to a couple of hours), and the animals spend most of their time feeding on palm fruits or leaves or resting in the middle part of a palm tree.



- ***Resident orang-utan females surviving in small forest patches retained within the oil palm landscape***. Orang-utan adult females are territorial, and they usually reside close to where they were born. We currently know several females living in small forest patches located within the palm oil matrix. Of course, chances of survival are increased with the number and size of set asides, by improving habitat quality, by enrichment planting key food species, and by improving the overall connectivity across the landscape.

- ***Large territorial adult flanged males***. They can move over vast distances, and we have seen them in palm plantations more than 5 km away from the nearest forest. They are penetrating deep inside the plantations that likely were once a contiguous part of their territory to move between forest patches and to look for breeding opportunities.

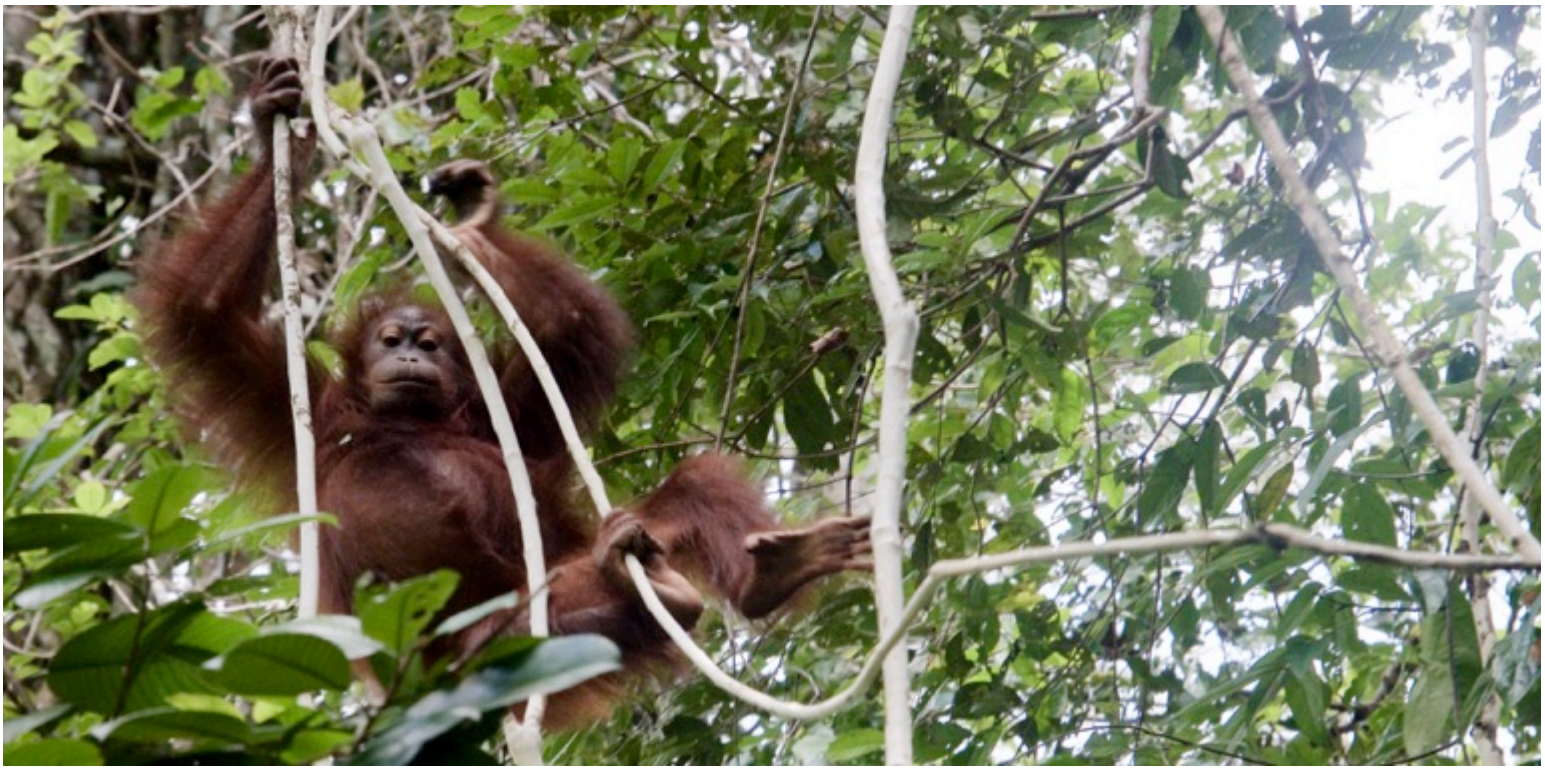
- ***Smaller less-territorial unflanged adult males.*** Unflanged males roam widely in search of females or places where food is plentiful to establish their new territory. During these dispersal periods, these males often travel extensively in the plantations to look for new forest areas and mating opportunities.

Our findings are crucial for orang-utan long-term conservation.

Indeed, HUTAN's work shows that small forests or groups of small forests ("stepping stones" or "clusters") are necessary to maintain critical reservoirs of orang-utan genetic diversity within the agricultural landscape where highly philopatric females likely still live. They also provide shelter, rest and recuperation sites for dispersing males that travel widely between the now fragmented larger forest reserves.

These results highlight the need to manage wild orang-utans at a meta-population level, i.e. at the scale of entire landscapes, and not on isolation, as it is too often the case with the conventional population approach.

To do that, there is an urgent need to engage seriously with the oil palm industry to improve the overall agricultural landscape within the orang-utan range in Borneo.

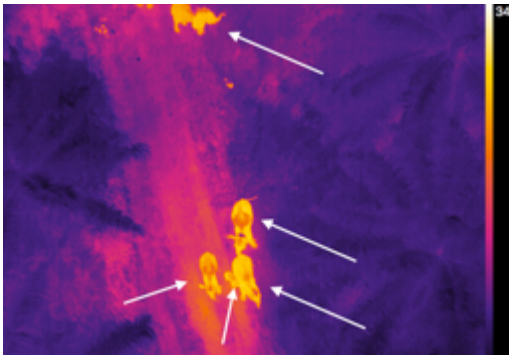


Conserving the Bornean elephant

In Kinabatangan, The HUTAN "Wildlife Survey and Protection Unit" has focused its efforts in following and monitoring elephants that are roaming across oil palm plantations. Some of the family units spend up to 70% of their time in these landscapes. Animals mostly feed on fragments of freshly cut palms that are chipped when the plants are replaced by new ones at the end of their production cycle (a rotation cycle between two successive plantings is about 25 years). Most of our observations are conducted in Melangking Oil Palm Plantations, or MOPP, a 9,000 ha company that decided to remove their electrical fences to let the elephants roam in their estate. Our data include individual identification (with photo ID) and body condition scores (to assess individual health), location (GPS and satellite tracking), herd size, and overall behavior, types of damages (if any). Remarkably, the level of damages has drastically reduced since the fences were removed by MOPP. We also witnessed significant behavioral changes: the elephants are now extremely quiet and very tolerant of people's presence in MOPP.

The experience led by MOPP shows that it is actually possible for oil palm plantations and elephants to coexist peacefully, but this requires an integrated land-use management allowing for safe elephant passage, and an adequate level of awareness for people to know how to behave close to and accept elephant presence.

In May, a team of scientists from Liverpool University led by Prof Serge Wich spent a few days with us to investigate the possible use of thermo-imagery to detect large mammals (such as orang-utans and elephants) under the close canopy of tropical forests. It was easy to locate elephants at night in a plantation with this new technology (see picture).



Outside of Kinabatangan, the team organized regular visits and discussions with the villages that have been facing recent elephant damages. These repeated sessions were needed to build trust with the villagers and to make them understand how they could organize themselves to learn how to co-exist with the pachyderms. The WSP team also spent a lot of time and efforts in training the "Community Elephant Ranger Teams" that are in charge of mitigating Human Elephant Conflicts in their respective villages. WSP is currently active in seven villages distributed in three different Districts of Sabah.

Our field surveys and community consultations allowed to better understand the underlying reasons of the conflicts with elephants. Then we can start to propose long-term solutions based on the knowledge of the local situation that would not rely on translocation and fencing only. Indeed, like for orang-utans, the future of elephants in Sabah relies primarily on how people are willing to accept to co-exist peacefully across the species range.

More than 30 elephants were killed across Sabah in 2018 (six in Kinabatangan). This situation is worrying, from a welfare perspective (animal suffering), from a conservation perspective (the removal of large bulls may have a long-term impact on the genetic fitness of the overall population), and from a safety perspective (with the increased stress and aggression levels of the remaining herds). We fear that this is only a matter of time before elephants start attacking people, injuring them or even killing them. It will then become even more difficult to convince people to accept to co-exist with the pachyderms. It is therefore extremely important to stop illegal elephant killing. However identifying the persons who are responsible for elephant killing has proved very challenging in Sabah, and so far no one has been prosecuted for these crimes.

Rescue of a baby elephant

At two occasions, during their field activities, the WSP unit found a young baby elephant that was lost in an oil palm estate. Instead of calling the Wildlife Rescue Unit for a capture and translocation to Sepilok Elephant sanctuary, the team located the herd and pushed back the baby toward the group.

This process took several hours, but eventually the baby was reunited with his Mum.

Conserving hornbills in Kinabatangan

Hornbills are cavity breeders, and rely on hollow tree trunks to nest. However with the destruction of the vast majority of large trees in Kinabatangan for timber extraction, potential nesting sites are scarce and subject to a fierce competition between the various breeding pairs of birds. The WSP team is conducting regular surveys to locate and repair (when necessary) potential natural cavities (a total of 15 cavities was identified last year).


Young rhinoceros hornbill exiting the artificial nest box set up by KOCP

HUTAN has also initiated an artificial nest campaign to boost the breeding chances of hornbill populations living in Kinabatangan. To date, HUTAN has constructed and erected 12 artificial nest boxes in the forests of Lower Kinabatangan: six large boxes (targeting helmeted and rhinoceros hornbills) and six small boxes (targeting other species). In 2018, two different pairs of rhinoceros hornbills used two large boxes set up in 2014. To date these nests have produced three viable chicks. This is the first time that wild rhinoceros hornbills have been using artificial nest boxes for breeding purposes, and at HUTAN we are extremely proud of this achievement. Our goal is now to improve our prototypes in order to replicate and install them in overdegraded forests and man-made landscapes to sustain the declining populations of these magnificent birds.


GOT A QUESTION? Ask Birds

NEWS

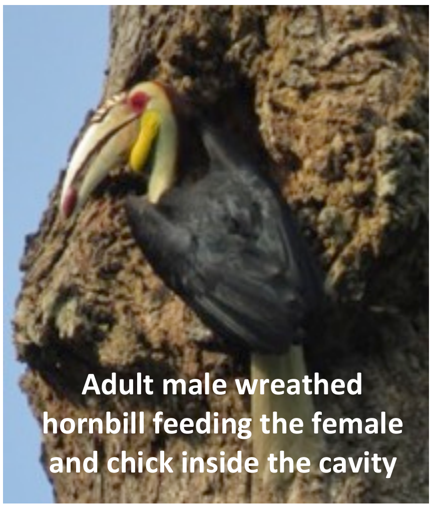
Threatened rhinoceros hornbills use artificial nest-boxes in world first

CONSERVATION

"We can measure the internal humidity and temperature to get an idea of how our artificial nest-boxes should be functioning"
– Ravinder Kaur, project leader

photos: SANJITPAAL SINGH / JITSPICS.COM

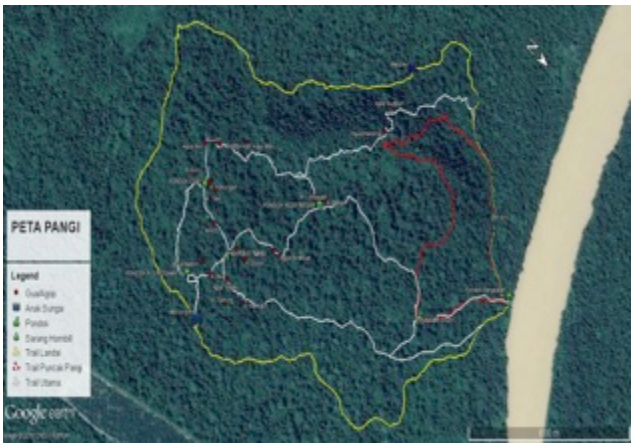
The team also monitored and recorded data on the nesting behavior of seven different pairs from four different species:


Adult male wreathed hornbill feeding the female and chick inside the cavity

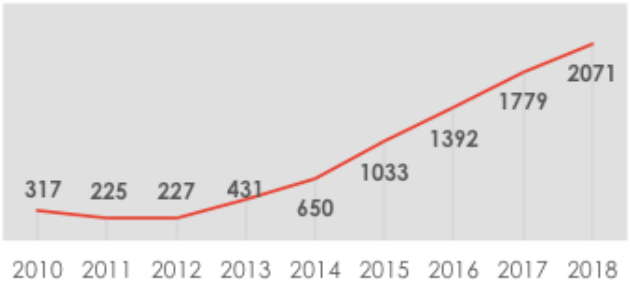
Oriental pied hornbill: 2 natural nests used by two different pairs of birds;
Wreathed hornbill: 1 natural nest (the chick exited the nest in October);
Bushy crested hornbills: 1 natural nest (the same nest that was used by the pair of Helmeted hornbills since 2014);
Rhinoceros hornbills: 2 artificial nest boxes used by two different couples (the female exited the nest a couple of month before the chick. The chicks exited the box in October and November);
Wrinkled hornbill: 1 natural nest (the female exited in October and the chick in November).

Conserving the colonies of swiflets in Pangi

In the late 1990's and early 2000's most of the swiflet colonies found in Lower Kinabatangan went extinct because of uncontrolled harvesting of the nests. In December 2009, HUTAN, the Sabah Forestry Dpt and the SWD developed a recovery programme of the edible nest swiftlet population found in the Pangi Forest Reserve near Sukau. Since 2010, a team of 11 permanent staff and 10 interns has the mission to protect the colonies of swiflets living in the cave system of Pangi. The team is on duty 24 hours a day all year long to prevent poachers from stealing the nests and destroying the clutches of birds.



Pangi is a Class I Virgin Jungle Forest Reserve of 439 ha located along the Kinabatangan River. This limestone outcrop contains more than 40 different caves. Two species of swiflets are using these caves for breeding purposes: the white nest swiflet (*Aerodramus fuciphagus*) and the black nest swiflet (*A. maximus*). Since the beginning of this project, HUTAN decided to not harvest the nests to minimize the disturbance and stress to the birds. In 2018, we recorded the presence of 2071 nests at the end of the breeding season (September). This represents a 550% increase of the total number since 2010 (see graph).



Over the past few years the villagers of Sukau have started to build artificial swiflet houses in the village to attract the birds, creating an alternate source of incomes. Today, at least 12 of these farms are found in the village, and more are being built. Some of these artificial farms are already occupied by dozens of breeding birds. We observed that most of the birds colonizing these farms are actually originating from Pangi FR. This is an unexpected and very positive outcome, since many families will indirectly benefit from our conservation efforts of the wild colony breeding in Pangi FR.


Going down into the caves


Inspecting the caves

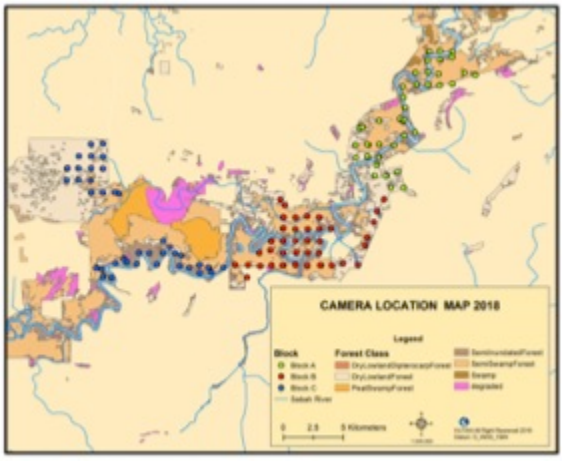
Camera trapping in Kinabatangan

The Lower Kinabatangan Wildlife Sanctuary, retains the last vestiges of lowland rainforest biodiversity in a landscape largely converted to agriculture, including at least 21 carnivore species. Carnivores play important ecological roles; however, many species are threatened and their status is poorly known. Monitoring is critical for evaluating biodiversity trends, management effectiveness, and informing policy. A species of particular interest is the endangered flat-headed cat (*Prionailurus planiceps*). The flat-headed cat is one of the most endangered felid species in the world. It is also a poorly known species with a patchy distribution around wetlands in Sumatra, Borneo and peninsular Malaya.


Picture of the rare and elusive flat-headed cat

Supported by a team of Australian and the American NGO Panthera, HUTAN initiated a camera trap-based monitoring program to evaluate population status and trends of carnivores and other medium-size mammals. Eddie Ahmad, WSP team leader, was trained about camera trapping in Australia and in Sabah. To be more efficient in the field, we coupled this campaign with a SMART approach to assess poaching pressure in the forests of the Sanctuary (see the section on wardens).

In three successive sessions, the team deployed two camera traps at 40 different locations (so 80 cameras were deployed during each session). Some of the sites that were initially selected on the maps could not be reached because of swamps and inundation. Overall, fifteen cameras were stolen during the deployment in the field. In total we detected the presence of 12 different species of carnivores, the commonest one being the Malay civet (*Viverra tangalunga*), the Bornean striped palm civet (*Artogalidia stigmata*), Malaysan sunbear (*Helarctos malayanus*) and the Malay badger (*Mydaus javanensis*). We also recorded six clouded leopards (representing at least three different individuals).



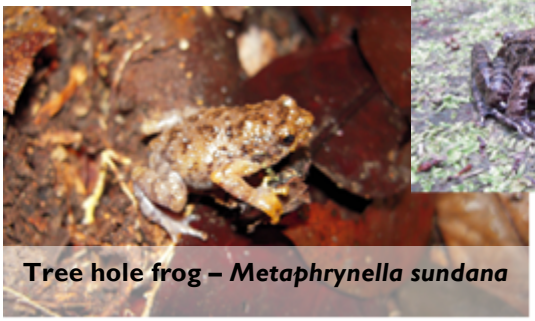
Documenting trends of wildlife populations in Kinabatangan

Map showing the location of proboscis groups along section 2 of our survey (n=12 sessions)

Since 2010, HUTAN is surveying primate populations along the river bank along two permanent stretches of River. The same team of two observers is conducting the survey along two permanent stretches of river: section 1: Resang River to Tomangong (8.6 km) – covering Lot 2/Pangi/Keruak; section 2: Tenegang Besar to Melapi (8 km) – covering Lot 3 and 4. The surveys are conducted during three consecutive days on each section. Data recording includes time and location of the sightings, species, group size and composition, location tree species, and behaviour of the group, etc.

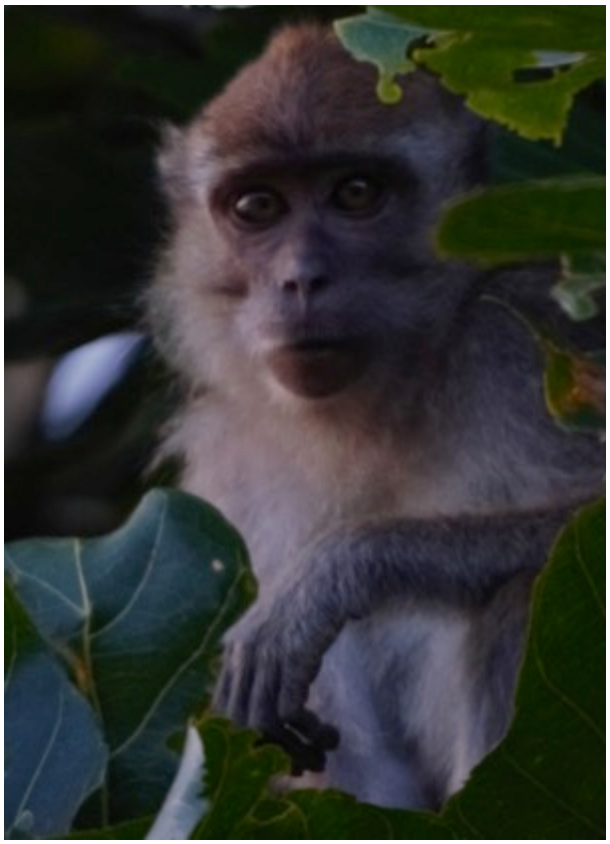
Last year in average, the overall encounter rate for proboscis was 0.5 group/km, which compared rather well with our baseline data (see previous HUTAN Activity and Field Expedition Reports). However a spike of encounters occurred during the fourth trimester in Teneggang with 1.7 group/km. The average group size of the proboscis harem (or "one male unit") was 1 adult male; 5.2 adult females; 3.2 juveniles and 1.7 infants (or about 11 individuals per group), which is also similar to previous data. Long tailed macaques were the most commonly sighted monkeys but their number was also showing huge fluctuations: 15 groups (217 ind.) in March *vs* 3 groups (18 ind.) in September along section 1; 14 groups (215 ind.) in September *vs* 11 groups (40 ind.) in January along section 2.

Every year, during the rainy season, the WSP team is surveying a total of twenty 400 m long permanent transects for Amphibians presence. So far, we have identified 22 species of frogs in the Lower Kinabatangan. One of them is not described yet for Sabah. Results of this monitoring show a decline of forest-specialist species in smaller fragmented forest patches and an increase of commensal frogs.



Tree hole frog – *Metaphrynella sundana*

Rough sided frog
Hylarana glandulosa



The HUTAN Honorary Wildlife Wardens:

patrolling and protecting wildlife and wildlife habitat

The Sabah Wildlife Department (SWD) can confer the title of "Honorary Wildlife Warden", or HWW, to any member of the general public, following the completion of a training delivered by the SWD and successful examination. More than 500 HWW are officially active in Sabah: they are the eyes and the ears of the Department. In July 2018, 26 villagers (20 HUTAN staff and 6 villagers from Litang and Ulu Muanad) attended a session organized at HUTAN HQ; 22 persons were gazetted as HWW.

The HUTAN team of HWW (28 pax), led by Berjaya Elahan, is organizing regular patrols by boat, by car or on foot to detect any illegal activity. The team erected several signboards at three hotspots regularly used by poachers to enter the protected forests of the LKWS. The HUTAN HWW came across snares or pits that target wild boars but that can injure and kill elephants (see pictures). We also detected and destroyed hunting towers and traps within protected forests. A hunting camp was raided (with the support of the police) and destroyed, but no one was apprehended.

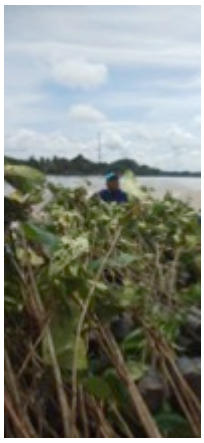
Elephant killing is becoming a major concern in Sabah: animals are killed for ivory, or because of conflicts. Several elephants were found poisoned in plantations but the causative agent and source of poisoning has not been identified yet. So we still don't know whether this poisoning was intentional or not. The HUTAN Wardens were involved in the investigation of the death of several elephants (see for example the picture of a young elephant discovered by WSP in an oil palm estate). No one has ever been convicted for elephant killing in Sabah, although the species is Fully Protected (Annex I of the Wildlife Enactment) in the State.

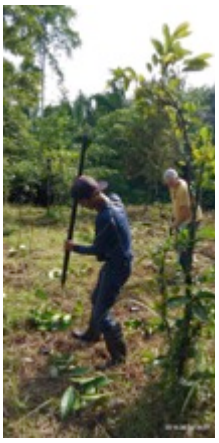
Government and NGOs need to step up their efforts to halt these killings. The PROTECT initiative was launched by the government at the end of 2018: it intends to create a better synergy between NGOs, state agencies and other partners involved in law enforcement activities.

At the end of the year, the HUTAN HWW were called by the SWD to participate in several sting operations at the Sandakan market to seize turtle eggs that were sold illegally. Illegal wildlife trade is increasing in Sabah following the influx of tourists from mainland China.

Reforestation efforts in Kinabatangan

Forest degradation and fragmentation in the Lower Kinabatangan are currently one of the major threats to the long-term survival of most wildlife species in the area. Since January 2008, HUTAN is implementing a long-term project to rehabilitate crucial habitat and recreate functional forest ecosystems along the Kinabatangan River.





The HUTAN reforestation Unit consists of seven women working full-time and four interns. In 2018, the team planted 10,100 trees and maintained about 65,000 seedlings planted over the past few years. Since the beginning of their activities in 2010, the team has planted more than 150,000 trees. Our survival rate fluctuates according to tree species, location, weather conditions and damages caused by wildlife. However, thanks to the dedication and the intensive maintenance efforts of the team, we are able to reach an average of about 75% survival rate after 3 years. The team is now planting about 15 different species of trees. The choice of the species to be planted depends on local conditions encountered on site. *Ficus* trees and *Nauclea* can start bearing fruits after 18 months; they will then attract wildlife that in turn will disperse seeds from other plant species in our plots.

By sourcing seedlings from local families this project is also contributing to local livelihoods of several villages. In 2018, the team allocated a plot for children from Kinabatangan: the "Anak Engkat" initiative planted 200 trees, while the "Junior Rangers" planted 500 seedlings. The kids are now in charge of maintaining and monitoring this plot. Creating a connection between children and trees is indeed a way to raise awareness about conservation needs in the region. The Reforestation team has participated in several events and festivals (such as "Rhythm of Rumba" in Sandakan) to promote their work and to explain to the general public why reforestation efforts are needed to maintain a balance between people and nature. The team has also been following several conventions and discussions about women rights and empowerment as part of their career development.

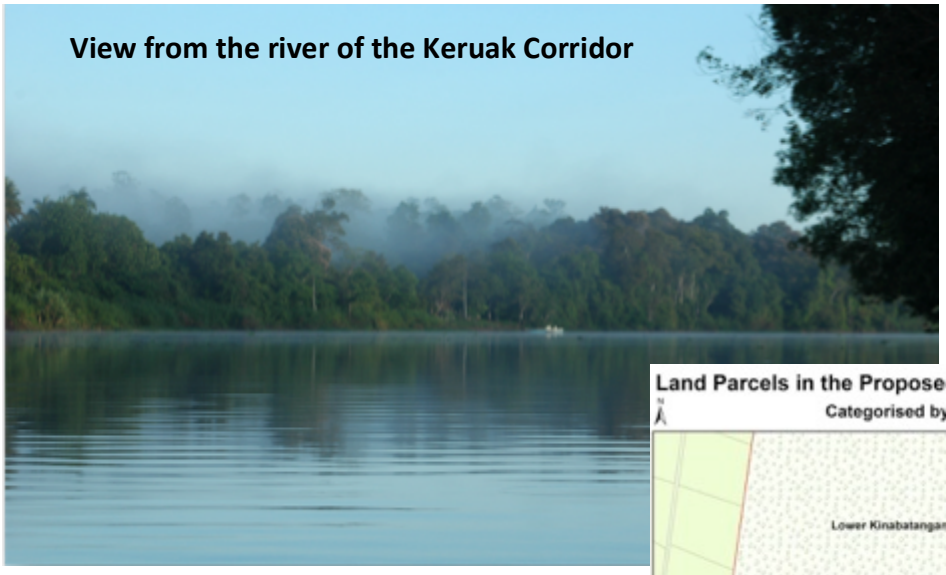
The entire KOCP team prepared a site for the HUTAN Tree Memorial, during the HUTAN 20th Anniversary. We planted seedlings to honor the memory of people who contributed to save Kinabatangan.

Creating natural corridors along the Kinabatangan River

Since 2013, HUTAN, the World Land Trust and the Rainforest Trust are working together with the State authorities to create the "Keruak Wildlife Corridor". This Corridor will reconnect two fragmented protected areas near the village of Sukau. This area (about 200 acres) is still mostly under forest cover and is comprised of a mix of land status types composed of 41 distinct parcels. The project aims to acquire these parcels with the ultimate goal of gazetting these titles as an extension of the Wildlife Sanctuary

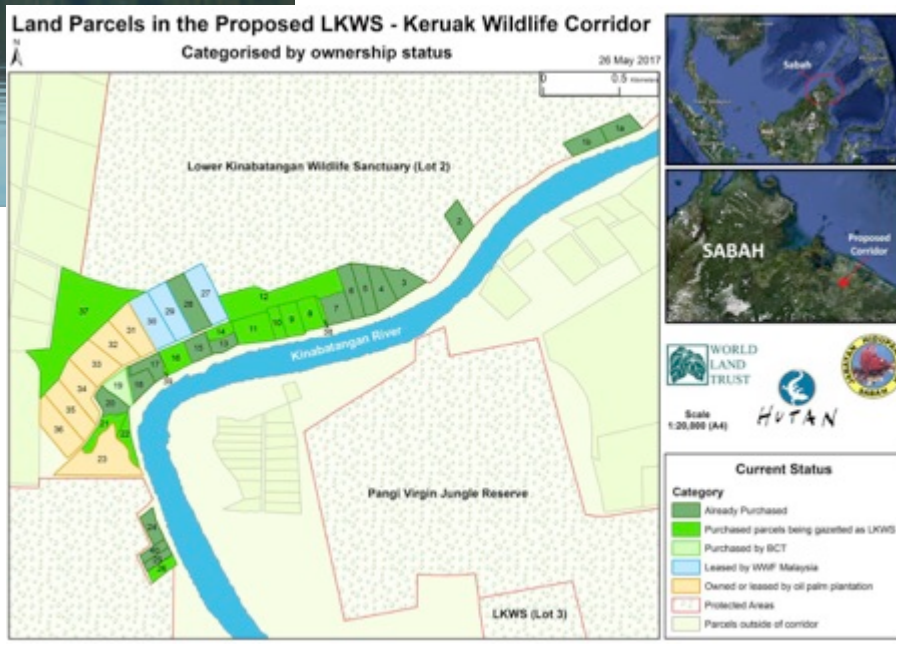
Seven parcels (parcels 23 and 31 – 36) owned by Genting Plantations Berhad (GENP), are covered by mature oil palms; they represent a total of approximately 110 acres. In 2016, GENP agreed to allocate the totality of its 7 parcels of land to the purpose of wildlife conservation while retaining the ownership of its land. On 27 August 2018, a Memorandum of Agreement with the Sabah Wildlife Department was signed to formalize this commitment. Electric fences have now been removed to allow wildlife movement and the HUTAN Reforestation Unit will start planting seedlings of native trees between the mature palms in 2019, to facilitate a gradual return to natural forest. ***This ground-breaking conservation agreement will hopefully serve as a model for future innovative and mutually beneficial public-private partnerships fostering the preservation of critically endangered wildlife populations and of their habitat.***

Based on the success of this first pilot project, HUTAN has initiated the creation of two new forest corridors to link Pangi Forest Reserve with Lot 1 of the LKWS, and to secure a riparian corridor along the Meninggul River, home to the flat-headed cat.



View from the river of the Keruak Corridor

To facilitate further wildlife movements in the region, HUTAN is also setting up "Orang-utan" bridges" above small tributaries that have become impassable for species that cannot swim, such as the orang-utan.



Last year, with support from Chester Zoo, we refurbished a few bridges installed in Sukau area.

Rajak Saharon, one of the orang-utan field researchers, performing original songs about environment with the HUTAN band during an education event

HEAP: Hutan Environmental Awareness Project

To address the overall poor awareness on conservation issues in Sabah, we established the HUTAN Environmental Awareness Project (or HEAP) to concentrate on environmental education. HEAP's main goal is to incorporate and support HUTAN's overall mission *"to achieve long - term viability of wildlife living throughout Sabah"*.

A strong collaboration exists in Sabah between the various environmental education groups (NGOs or state agencies) that are all gathered under the SEEN umbrella (Sabah Environmental Education Network). In 2018, HEAP organized 37 school events, many located on the western side of the State where hunting is part of the local culture. HEAP was also invited to take part in 17 additional school events organized by various SEEN partners. Overall, HEAP reached out more than 17,000 children and teachers during their school programmes.

An increasing number of schools from across the entire State are now inviting HEAP to deliver high quality environmental education events in their premises. Last year, three primary and secondary schools from Lahad Datu, Beluran and Sukau requested HEAP to sign an official MoU, and to design, develop and implement a five-years Environmental Education Plan with them.

Since wildlife is increasingly found within agricultural landscapes, it is crucial to raise awareness with oil palm workers and their families. In 2018, HEAP organized events in 11 palm oil estates reaching more than 2,500 children and parents.

HEAP also displayed their mobile exhibition at 11 festivals and major celebrations, such as the "Borneo Bird Festival" (organized in Sandakan), the "Rhythm Of Rimba Festival" (Kota Kinabalu); "The Elephant day" (with the Umbrella Campaign in Kota Kinabalu), "the International Run for Orang-utan" (Sandakan); the "International Orang-utan Day (Sepilok), the "World Animal day" (University Malaysia Sabah, Kota Kinabalu); World Global Elephant Day (MOPP); etc. We estimate that more than 7,000 people were reached by our activities during these events. HUTAN was also invited to officiate the opening of the "Borneo Eco Film Festival" in November 3-4th, 2018. The theme of the day was to promote ways to coexist with wildlife in Sabah. A public discussion followed the projection of the movies.

In Sukau, HEAP has replicated the concept of "Junior Rangers" by creating the "Anak Engkat" initiative, where young children are involved in reforestation activities over a five-year period (see above). Last year, both teams planted more than 700 seedlings. HEAP is also raising awareness with students and visitors from Malaysia and abroad: Dragon Fly (MSc students from the USA); local universities; staff from government agencies (SWD, SFD, Police); etc.

The HEAP team is evaluating the results of its education efforts according to an analytic frame developed in collaboration with professional educators from Chester Zoo.

Seratu Aatai and the Umbrelephant Campaign

Dr Nurzhafarina Othman, nicknamed "Farina" recently completed her PhD on elephants. Farina is now in the process of developing a new Initiative named "Seratu Aatai", local language for "Leaving in Harmony". For the next two years or so, Farina will develop SA under the umbrella of HUTAN, and at the same time will co-supervise HUTAN's activities related to elephant conservation activities.

Farina is also spearheading the "Umbrelephant campaign" that was launched officially in Kota Kinabalu by the Ministry of Environment, Tourism and Culture. The goal of this campaign is to produce regular messages, videos, and events to promote acceptation of elephant presence and pride within the civil society of Sabah. SA organized several events at the Lok Kawi Zoo (Kota Kinabalu), and in Telupid, with the Sabah Motorbike Club to erect four signboards along the Telupid-Sandakan highway to warn drivers about possible elephant crossings. Local newspapers largely covered this event.

Enhancing human capacity to better manage wildlife in Sabah

HUTAN is a resource organization in Sabah; one of our goals is to develop a training platform that will benefit other communities and partners.

With the development of the Community Elephant Ranger Teams (see above), our goal is to train and equip communities affected by elephants with some of the conflict mitigation techniques that are used by Kinabatangan communities to reduce damages and to lower conflicts to an acceptable level. Capacity building typically involves a combination of activities, such as group discussion, field work, data collection, lectures to improve basic knowledge about elephant ecology and behavior, exposure events, "fishbowl" role plays (to train CERTs member to react when confronted with angry villagers for example), etc. HUTAN organized six several sessions with the various CERTs in 2018.

Seratu Aatai and HUTAN also organized a general workshop in Sukau about HEC data collection, analysis and interpretation. We shared the "GeoODK Collect App" developed by SA. This App is an easy way to collect information about damages and HEC in the field. A total of 40 participants attended this training course: members from all CERTs, staff from the Sabah Wildlife Department and various oil palm estates; from WWF Malaysia and TFT-Rurality.

Training delivered on site by WSP to the CERT trainees about electrical fencing: design, erection, maintenance

HUTAN also organized several training events for other stakeholders, such as (this list is not exhaustive):

- April and November: wildlife monitoring (two five-days sessions) for the staff from the Forestry Dpt posted in the Segama Wetlands RAMSAR Site as well as community members (n=25 pax);
- April 14th, 2018: event conducted at Melangking Plantations about elephant management and conflict mitigation (25 pax);
- June (2 days): Environmental Education Race: training of 15 teachers from primary and secondary schools about environmental education;

- May 21-26: training about wildlife monitoring and management targeting the "sustainability team" of the Sapulut Industry Plantations;
- September 2018: Wildlife and Elephant Management: staff from the Forestry Dpt of Sarawak (n=20 pax);
- September (2 days): police officers and wildlife patrolling;
- December 2018 (2 days): Wildlife Management strategy within an oil palm context: training of Managers and higher staff of MOPP (25 pax).

Building up our own capacities is of course essential to achieve our long-term conservation objectives. In 2018, the HUTAN staff attended various training sessions as part of their professional development to further develop their skills and knowledge, and to increase the network of our partners:

- Fire fighting and emergency cares, Sukau by the Fire Dpt (January, all staff);
- Tropical Biodiversity Field Course (19.02-04.03), Danau Girang Field Center;
- Camera Trapping and SMART (1 week in April), Kinabatangan;
- International Hornbill research training (2 weeks in May), Thailand;
- Workshop on Statistics (1 week, Kucing, Sarawak, Malaysia);
- Tree climbing (4 days, 10 staff, Sukau);
- Camera trapping with IZE and Panthera (1 week, Deramakot FR, 2 staff);
- Primate behavior and Ecology Field Course (2 weeks in July), DGFC;
- Two events about women empowerment (1 staff) and native rights (2 staff);
- International Educator Week (10 days, attended by 2 staff in Chester, UK);
- International Zoo Educator Association Conference (1 week, followed by 2 staff at Al Ain, Abu Dhabi);
- Singapore Zoo (3 days, 2 staff, September);
- Hutan-Takala learning exchange (1 week, October, 7 staff), Sukau;
- Tropical Biology Association (1 month: November), Danum Valley;
- Tessa Tool Kit Training: how to rapidly assess ecosystem services at the community level (1 week, November, Kinabatangan);
- Continuous training of the KOCP Filming Task Force or "Lensa Muara" (5 staff) by the "Suara" initiative: story board and story telling, film making, video recording and processing, sound, etc. The Task force produced several short videos that were presented during festivals and official events, as well as during the HEAP awareness programmes.





Improving policy framework for orang-utan and biodiversity conservation in Kinabatangan and Borneo

It is of the outmost importance to engage with the palm oil industry and the government to bring new thinking about possible co-existence between agriculture production and large mammals like elephants and orang-utans. Too often, industry players are not ready to share their land with wildlife that they often perceive as "pest". Consequently, they regularly ask the government to translocate the animals, or they take lethal measures against them.

Sen Nathan (right) presenting a memento to Assafal on behalf of the organizer of the cientific Forum.

Towards a better understanding between scientists and oil palm industry

KOTA KINABALU: "Is it better o share or not the land with wildlife in Sabah?"

This was one of the 20 questions

to keep animals inside would not be efficient especially for large roaming species, such as elephants; would be too costly to maintain and would isolate even

A panel of wildlife experts (including Hutan and SA) led a discussion with more than 200 growers during the "International Palm oil Society Conference", in Kota Kinabalu, September 19th, 2018. The debate was about how plantations could support the persistence of elephants within the agriculture landscape. An output of this discussion was the organization of the "First Scientific Community Forum" on November 28th, 2018. This Forum, entitled "Finding Solutions for Human Wildlife Conflicts", brought together more than 60 scientists from key scientific organizations and actors active in biodiversity conservation in Sabah to brainstorm about some of the questions frequently asked by politicians, members of the oil palm industry and other partners. The overall recommendation endorsed by the workshop participants was that the future of most populations of wildlife will largely depend on how people are willing to co-exist with animals. The Forum concluded that a "land-sharing" approach will ultimately bring more benefits than a "land-sparing" vision. The results of the Forum will be presented and further discussed with members of the oil palm industry and the government during an International Conference that will be organized in Kota Kinabalu in April 2019.

Last but not least, HUTAN is also active in several national and international initiatives, such as:

- Steering Committee for the Jurisdictional Approach for Certified Palm Oil (following the decision by the government to produce only certified palm oil by 2022);
- RSPO Board Member and member of the "RSPO Compensation Task Force";
- Member of the IUCN Palm Oil Task Force;
- Member of the IUCN SSC Asian Elephant Specialist group (part of the team tasked to develop the Elephant State Action Plan); IUCN Great Ape Specialist Group (Marc is developing the Orang-utan State Action Plan);
- Founding member of the PONGO Alliance, pursuing the vision of making resilient landscapes for wildlife and people a reality;
- Founding member of the "Borneo Futures" initiative, intending to produce groundbreaking science to inform policy makers;
- Several other working groups in charge of developing or issuing recommendations about policies and management plans.

Outputs (writings, conferences) of the year!

HUTAN is not an academic organization, but we thrive to produce high-quality science to support our conservation objectives. These outputs are essential to inform and influence the land deciders and the public of range and non-range countries. In 2018, HUTAN published the following articles and reports, which in turn generated a lot of media articles and radio/TV interviews:

Matsuda, I., Abram, N.K., Stark, D.J., Sha, J.C.M., Ancrenaz, M., goossens, B., Lackman, I., Tuuga, A., Kubo, t. 2018. Popuatin dynamics of the proboscis monkey Nasalis larvatus in the Lower Kinabatangan, Sabah, Borneo, Malaysia. Oryx, https://doi.org/10.1017/S0030605318000467

Meijaard, E., Sherman, J., Ancrenaz, M., Wich, S.A., Santika, T., Voigt, M. 2018. Orang-utan populations are certainly not increasing in the wild. Current Biology, 28, 1221-1242. https://doi.org/10.1016/j.cub.2018.09.052

Spehar, S.N., Sheil, D., Harrisson, T., Louys, J., Ancrenaz, M., Marshall, A.J., Wich, S.A., Bruford, M.W., Meijaard, E. 2018. Orang-utans venture out of the rainforest and into the Anthropocene. Science Advances, 4: e1701422.

Morgans, C.L., Meijaard, E., Santika, T., Law, E., Burdita, S., Ancrenaz, M., Wilson, K.A. 2018. Evaluating the effectiveness of palm oil certification in delivering multiple sustainability objectives. Environmental Research Letters, 13, 064032, https://doi.org/10.1088/1748-9326/aac6f4

Ancrenaz, M., Barton, C., Riger, P., Wich, S. 2018. Building relationships: how zoos and other partners can contribute to the conservation of wild orang-utans *Pongo* spp. Int. Zoo Yb.. doi:10.1111/izy.12184

Van Noordwijk, M.A., Atmoko, S.U,Knott, C.D., Kuze, N., Morrogh-Bernard, H., Oram, F., Schuppli, C., van Schiak, C.P., Willems, E.P. (2018). The slow ape: high infant survival and long interbirth intervals in wild orang-utans. Journal of Human Evolution, 125: 38-49.

Voigt, M., Wich, S.A., Ancrenaz, M., Meijaard, E., …, Kuhl, H. 2018. Global demand for natural resources eliminated more than 100,000 Bornean orang-utans. *Current Biology* 28: 1-9. https://doi.org/10.1016/j.cub.2018.01.053

Ancrenaz, M., Bergl, R., Greer, D., Humle, T., Kormos, R., Kuhl, H., Macfie, E., Maisels, F., Oates, J., Robbins, M., Sherman, J., Sop, T., Williamson, L. (2018). Report to the CITES Standing Committee on the status of Great Apes. Refish, J. and Wich, S.A. (eds). UNEP GRASP, Nairobi, and IUCN, Gland.

Wich, S.A., Delabre, I., Koh, L.P., Ancrenaz, M., Meunier, Q., Gaveau, D., Carlson, K.M., and E. Meijaard. (2018). The future of oil palm. In Meijaard, E., Garci-Ulloa, J., Sheil, D., Wich, S.A., Carlston, K.M., Juffe-Bignoli, D., Brooks, T.M. Eds. Oil palm and Biodiversity: a situation analysis by the IUCN Oil Palm Task Force. IUCN Palm Oil Task Force, Gland, Switzerland, pp. 70-85.

Sheil, D., Wich, S.A., Ancrenaz, M., Gaveau, D.,Karlson, K.M. and P. Furumo. (2018). Oil palm impacts on biodiversity. In Meijaard, E., Garci-Ulloa, J., Sheil, D., Wich, S.A., Carlston, K.M., Juffe-Bignoli, D., Brooks, T.M. Eds. Oil palm and Biodiversity: a situation analysis by the IUCN Oil Palm Task Force. IUCN Palm Oil Task Force, Gland, Switzerland, pp 19-41.

The report produced by the IUCN Palm Oil Task Force was launched during the RSPO Conference in Paris, June 2018. This report also generated a lot of media attention and Marc gave twelve radio and TV interviews about HUTAN's findings. HUTAN staff also attended several national and international conferences and delivered more than 50 presentations this year.

In 2018, HUTAN activities were highlighted in two documentaries produced and broadcasted by Radio TV Malaysia (RTM), the major public national channel, contributing to raise awareness about Kinabatangan in the country.

Preliminary results of HUTAN Evaluation and Assessment

In 2017-2018, the group Wildlife Impact (https://wildlifeimpact.org) conducted an independent impact assessment of HUTAN's conservation efforts. This assessment was based on stakeholder interviews, analysis of reading materials, and a web-based investigation. Although the final report is not available yet, some of the preliminary findings indicate the breadth of our efforts.

Assessing impact of scientific articles…..

The HUTAN science impact analysis was assessed by Wildlife Impact with the H-index scores and media activity metrics (Altmetric.com).

H-index is the number of scientific articles with at least "h" citations. An h-index of 25 means the person has authored 25 items that have 25 citations or more. The h-25 for Marc Ancrenaz (as a proxy for HUTAN) was 29.29, which is among the top cited work, and comparable to other well-known orang-utan scientists.

Altmetrics are qualitative and quantitative attention scores for peer reviewed published science that "can indicate how many people have been exposed to and engaged with a scholarly output". Altmetrics can also provide a proxy indicator for whether research is driving change within a particular discipline or area of study, such as when it is referenced by other experts and practitioners or by policy makers or influencers (Altmetrics.com).

Out of Hutan's 62 scientific publications, 35 peer-reviewed articles had an Altmetric data, and 24 of these articles were covered by news media, in prominent international papers and magazines including the New York Times, the Guardian, BBC, ABC news (Australia), Times of India, International Business Times and CNN, as well as Malaysian papers Malay Mail, the Star and Malaysian Insider. This result shows that HUTAN is bringing significant international attention to Sabah's rich biodiversity and its conservation and reaches a large global audience with referenced articles. **This reach alone represents over 400 million persons globally and 3 million persons in Malaysia.**

The major conclusions of the report by Wildlife Impact stated that "Hutan's impact is impressive. The full breadth of the organization's work and the positive change it has brought to local communities and to the government and business community's practice of conservation appears understated in Hutan materials".

"Hutan is embedded in government policy-making and monitoring. They regularly influence management and are sought after for technical advice. They have directly contributed to protected area development and designation, and development of management standards, policies and protocols for conservation."

"Stakeholder engagement is excellent and a strength of the organization. Hutan is able to create strong partnership in large part due to the work of Marc and Isabelle, who are well respected within the government, scientific, community and conservation activist sectors. Hutan's community-led conservation model has created employment (as the largest employer in Sukau) and thereby changed local perceptions and engagement in conservation."

Table summarizing the views collected during the stakeholder interviews (n=11 persons)

Hutan is changing minds or behaviors in how people interact with forest and natural resources	73% all respondents
Hutan is providing work for local community members	82% all respondents
Hutan's science is important, ground-breaking, excellent quality	91% all respondents
Hutan is building capacity for local villagers	100% all respondents
Hutan's relationships with government are good; the government values Hutan	64% of all respondents
	100% of non-staff respondents (staff did not comment on this issue)
Long term sustainability of Hutan and their work is an issue	82% all respondents

The major weakness identified during this assessment was about the long-term financial sustainability of the programme.

In 2018, donations received to support HUTAN conservation activities originated from*:

More than 100,000 USD:
Arcus Foundation

50,000 - 100,000 USD:
Houston Zoo – North England Zoological Society (Chester Zoo) - Woodland Park Zoo - World Land Trust

25,000 - 50,000 USD:
Basel Zoo - Synchronicity Earth - The Orang-utan Project - Zooparc de Beauval

5,000 - 25,000 USD:
Arizona Conservation Center (Phoenix Zoo) – AZA Orang-utan TAG – Cheyenne Zoo - Cleveland Zoological Society – Univet Nature- Holonics Hospital – Zoo la Palmyre – Oregon Metroparks Zoo – Public Trust Keidanren Nature – Saint Louis Zoo – Points Family Trust - Nashville Zoo - Wildlife Conservation Network -

< 5,000 USD:
Apenheul Zoo – Finley foundation - Intrepid Travel foundation – Kansas City Zoo - Les Amis du Zoo de Vincennes – Rotary Bale - Private donors -Wroclaw Zoo

**Note that this inventory is only listing the financial donations received during the 2018 fiscal year (actually the number of HUTAN's regular supporters is larger than this list, and includes partners such as Columbus Zoo, Fondation Ensemble, Hogle Zoo, Toronto Zoo, US Fish and Wildlife Services, and many others).*