

# Gunung Palung Orangutan Conservation Program

**Code RED**

*an e-newsletter from your friends in West Kalimantan*

August 2020

Issue 92

Dear Friends and Supporters,

I hope you have all been staying safe and healthy throughout the month of August. I'm excited to announce some changes that have taken place in Indonesia, and update you all on the work that has been going on. Due to the pandemic, all of our foreign staff returned to their home countries in late March. For a few months, through many Zoom calls, WhatsApp messages and emails, foreign staff were able to work remotely with those in the field in Indonesia. However, in order to most effectively manage the many projects that take place in Gunung Palung and the Ketapang office each day, we have made some change in our management structure, with our Indonesian staff moving into new roles.

In July, Edi Rahman, our most senior employee at GPOCP, was appointed to the role of Conservation Field Director. In addition to continuing to manage the Customary Forests and Wildlife Crime and Investigations Programs, Edi is now responsible for all the day-to-day management of conservation activities. In our first article, Edi writes about his 18 years of work at GPOCP and shares some exciting news from the Customary Forests initiative. Edi has devoted his career to leading the charge for orangutan conservation across the Gunung Palung landscape and our field activities will be in good hands with Edi leading the way. We also extend a heartfelt 'thank you' to Conservation Program Director Victoria Gehrke who has been overseeing the program from her home in Sweden since the lock-down began. She will now be starting a new master's degree in Sweden.

On the research side of our program, we say a partial good-bye to Muhammad Syainullah (Syai) and Ella Brown. Syai, one of our Field Laboratory Assistants, stepped into the role of Assistant Research Manager after Research Manager, Ella Brown, returned to the US because of the pandemic. Syai has been awarded a [West Bornean Orangutan Caring Scholarship](#) to attend college and begins his undergraduate studies at Tanjungpura University this September. Syai will continue to work part time for the project while living in Ketapang. Ella has continued to support the program for these many months and will begin a PhD program in Biological Anthropology at the University of Michigan in September. We thank both of them for their dedication to the project and overseeing the research during this challenging period. We are pleased to announce that Ahmad Rizal will be our new Assistant Research Manager at the Cabang Panti Research Station. Rizal previously spent six months at Cabang Panti conducting his senior thesis research on orangutan seed dispersal. Now that he has graduated, Rizal will be living and working at camp, overseeing the daily research activities. In addition, former Research Assistant and Boston University graduate, Natalie Robinson, has taken on the role of Program Coordinator, assisting with the management of both the conservation and research programs from Boston.

One of the projects that has been ongoing over the past few months is the analysis of our drone imagery of orangutans nests. In our second article this month, Conservation Research Director Beth Barrow updates us on this project. Beth spent the last year and a half running our orangutan population surveys and is now working from her home in England. In the article, Beth explains our newly developed methods to count orangutan nests captured by drone photographs. We also want to express our gratitude to the team of volunteers who are assisting her with this work.

Finally, I wanted to update you on the COVID-19 situation in the area where we work in Indonesia. Fortunately, the regions surrounding Gunung Palung have remained minimally impacted by the virus, and some in-person activities have resumed. On the 19th we were able to celebrate International Orangutan Day! Throughout the week students from 14 different schools participated in a [poster design competition](#). They exercised their creativity and drew some amazing artwork, all while spreading awareness about the critically endangered orangutan.

As many people return to work and schools resume (in some fashion) over the next month, I wish you all a happy and healthy September.

Sincerely,



Cheryl Knott, PhD  
Executive Director

[Gunung Palung Orangutan Conservation Program \(GPOCP\)](#)

**IN THIS ISSUE:**

Building Community Participation to Conserve Orangutans and Their Forests

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Using Drone Imagery to Estimate Orangutan Populations

**IN OTHER NEWS:**

We are excited to share a new publication from former Gunung Palung researcher and BU PhD graduate, Dr. Andrea DiGiorgio. Check out the article, 'Wild Bornean orangutan feeding rates and the Marginal Value Theorem' [here!](#)

On August 19th we celebrated International Orangutan Day with a [poster design competition](#). Below are the three winning submissions, created by students Regina Ronauli, Zahra Fajar Putri and Salsa Bila Pasya.



# Building Community Participation to Conserve Orangutans and Their Forests: My 18 Years at Yayasan Palung

By Edi Rahman, GPOCP Field Director

In 2000 I earned my Bachelor’s Degree from the Faculty of Social and Political Sciences, Tanjungpura University, Pontianak, Indonesia. After completing my education, I began work as an anti-corruption activist for an organization based in the Ketapang Regency, West Borneo. There, I met some friends who worked in the environmental sector, specifically focusing on orangutan conservation. Through conversations with environmental activists, I gained a desire to devote my life to the conservation of orangutans and their habitat.

In 2002, I received an offer to work for the Gunung Palung Orangutan Conservation Program (known in Indonesia as *Yayasan Palung*) as an Animal Protection Program Investigator. This was the perfect opportunity for me and I accepted the offer immediately. My job was to collect information on crimes against individual orangutans (hunting, trading and keeping as pets) as well as crimes against orangutan habitat (illegal logging, illegal mining, forest and land fires) that occurred in the Ketapang and Kayong Utara districts. I also assisted in early work to manage the animal rehabilitation center, before this work was continued by International Animal Rescue.



Edi Rahman in Gunung Palung National Park in 2009.

I continued this work as an investigator for 11 years, and in 2013 I became the manager of the Animal Crime and Investigations Program, in charge of saving animals and their habitats. I also was responsible for forming and assisting craft groups in several villages around Gunung Palung National Park, before this work became part of our Sustainable Livelihoods program in 2014.

In 2014, GPOCP shifted our work area to include a larger geographic region, and I was given the task of assisting several villages in Simpang Hilir District as part of a new Customary Forest program. The main goal was to assist villages in developing alternative economic opportunities by encouraging communities to sustainably utilize non-timber forest products (NTFP) which can be sourced from nearby forests.

These forests, on the outskirts of Gunung Palung National Park, are home to orangutan populations. Though not part of the National Park, the land is designated as a protected forest, but is still disturbed by human activities including illegal logging, hunting, forest and land fires. To protect these forest areas, the Indonesian government encourages community participation to maintain and manage forest areas through social forestry programs.

Through these regulations, we began working in 2015 with several communities in the Simpang Hilir Subdistrict, Kayong Utara Regency to create *Hutan Desa*. (This directly translates to ‘Village Forests’ but is also referred to as a ‘Customary Forests’.) The goal of this initiative is to have forests directly managed and utilized by the village community. This governing body is referred to



as *Lembaga Pengelola Hutan Desa* (LPHD), or, the Customary Forest Management Board. On February 27, 2017 the Ministry of Environment and Forestry of the Republic of Indonesia issued a decree which recognized the first five official Customary Forests, for which the villages obtained full management rights.



*Edi at the Yayasan Palung office in Ketapang, with his Ian Redmond Conservation Award which he was honored with in 2018.*

In 2018, Yayasan Palung helped initiate the process for two additional forest areas to become Customary Forests in the areas of Batu Barat Village and Rantau Panjang Village. Excitingly, on December 31, 2019, the government designated these two areas to become new Customary Forests. The formal letter, issued by the Ministry of Environment and Forestry, was just received this month and permits the villages’ Management Boards to supervise and utilize the Customary Forests for the next 35 years.

To ensure successful management of the Customary Forests, GPOCP and the Customary Forest Management Boards work together on various activities that take place within the Forests. Such activities include biodiversity surveys, ecotourism potential surveys, rehabilitation of ex-fire areas in forests with non-timber forest products (NTFP), surveys of carbon content in forests, and forest and land fire prevention campaigns. Most recently, last month we worked in Batu Barat and Rantau Panjang villages to conduct biodiversity surveys, in order to investigate the wildlife that inhabit these forests and count any orangutan nests that may be present (which indicate that orangutans are living in the area). Surveys in the other five Customary Forests will take place in September.



*Members of the Rantau Panjang Village Customary Forest Management Board learned to create survey transects during a recent biodiversity assessment.*

We’ve carried out other activities to increase community capacity, through various training activities using non-timber forest products around the Customary Forest areas. These NTFPs provide an alternative to community economic income – if village members can rely on the use/sale of sustainable forest products, they are less likely to harmfully exploit other resources as a means of income. One main way we promote the use of NTFPs is through the formation of Social Forestry Business Groups (KUPS). We have now formed 22 groups of craftspeople, who have successfully earned income using forest products like rattan, nipa palm, coconuts and honey.



*Edi (right) alongside members of a KUPS group. Here, craftswomen use dried nipa palm leaves to weave baskets, which can later be sold at markets throughout the region.*

I am very proud that over the past 5 years GPOCP has initiated these 7 Customary Forests. In total, there are now 7,962 hectares (about 20,000 acres) of land, designated for management by local villages. Most of this land is peat swamp forest, which is an ideal habitat for orangutans and other endangered animals. Peat swamp also helps to regulate the regional water cycle, and helps to prevent the release of carbon dioxide into the atmosphere.



Customary Forest Areas Initiated by GPOCP			
Village	Hutan Desa Name	Date of designation	Area (hectares)
Nipah Kuning	Hutan Bersama	February 27, 2017	2,051 ha
Pemangkat	Alam Hijau	February 27, 2017	1,245 ha
Pulau Kumbang	Kumbang Betedoeh	February 27, 2017	609 ha
Padu Banjar	Banjar Lestari	February 27, 2017	2,883 ha
Penjalaan	Simpang Keramat	February 27, 2017	376 ha
Rantau Panjang	Muara Palung	December 31, 2019	344 ha
Batu Barat	Batu Barat Jaya	December 31, 2019	454 ha
Total area: 7,962 hectares			

On July 1, 2020, I officially became the GPOCP Field Director, with the main task of coordinating all of our conservation programs. I have seen many changes and successes over the past 18 years at GPOCP. I feel a great sense of pride and belonging and have made every effort to provide the best service to this organization as we carry-out our mission to support the conservation of orangutans and their habitat. I am so thankful for all the GPOCP staff who have continued to support me and have given me the confidence to work as Field Director.

## Using Drone Imagery to Estimate Orangutan Populations

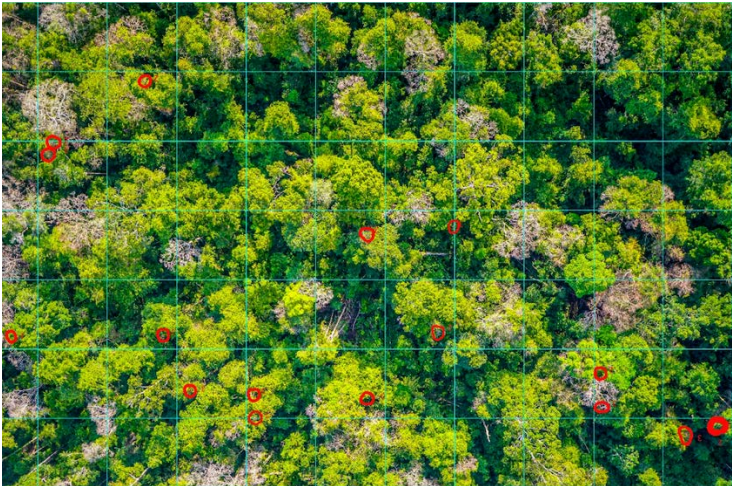
By Beth Barrow, Conservation Research Director

Our team just spent over a year in the field carrying out an orangutan population survey inside Gunung Palung National Park. This wasn't just your average population survey though; this one was designed to compare traditional methods with a new method using drone technology. Traditionally, observers walk line transects in search of orangutan nests, recording data for each nest they come across, which is later used to calculate an estimated density of orangutans in a given area. It's a time consuming and costly method. Observers are usually able to cover only around 2km of transect each day. To put that into context, our total walked transect length for this recent survey was just shy of 100km – no mean feat! Each month, our team spent around 20 days in the field, surveying areas using this traditional ground survey method, after which we enlisted the help of Aerozone, a drone consultancy company based in Jakarta, to fly drones over the transect area we had just surveyed by ground. We designed the survey to encompass both primary and disturbed rainforest, from around 0 to 1120 meters above sea level, across eight different habitat types. This design allows us to compare differences in nest detection in drone imagery throughout several distinct orangutan habitat areas within the National Park.



Beth (third from left), alongside Dr. Cheryl Knott and members of the ground survey team last summer in the degraded “Rangkong” habitat, between Cabang Panti Research Station and the edge of Gunung Palung National Park.

Although the field work has now come to an end, there is much work still to be done. Our drone surveys collected around 10,000 images in total, and each individual image must be scanned manually in search of orangutan nests. The first few months of analysis time were spent devising a working method for this process, with a lot of time spent testing out different methods and ironing out kinks in our approach. After settling on a method that allows us to accurately and efficiently search for and tag nests in the imagery, and then further compare our results with traditional nest counts in GIS software, we put together a team of 6 people to work on the analysis remotely, in the UK and US. Using Gnu Image Manipulation Program, we overlay a grid on a drone image and proceed to scroll through, searching grid-by-grid, for orangutan nests. Each time the observer finds a nest, they circle it in red and save a copy of the image. The drone images have an overlap of around 75%, meaning that a single nest is likely to be visible in up to 6 images. An important aspect of our method involves ensuring every duplicate nest is circled in every image, otherwise the next step of the analysis won't work. A single transect is made up of on average of 150 images and, depending on nest density, can take anywhere from 2-4 days to complete. With a total of 50 transects to analyse, that's 100-200 days of work dedicated to the big nest search. As you might be pondering as you read this, this aspect of the work is nowhere near as fun as searching for nests on the ground in the Indonesian rainforest!



Example of an image from one of our peat swamp transects in primary rainforest. Peat swamp habitat is known to be home to incredibly high densities of orangutans, and the results from our drone imagery did not disappoint, with up to 40 nests found in a single



*image! Observers zoom in on the image so that one grid square is visible on screen and then proceed to scroll through, systematically checking each square. Each individual nest is given a score of 1 to 3 to signify the observer's degree of certainty that they are looking at a nest and care is taken to ensure each individual nest is tagged in every image in which it is visible.*

Once all images for a transect have been searched and any nests tagged, I then use those edited images to build an orthomosaic in Agisoft Metashape Professional. This program stitches together all the drone imagery, removing any overlap, and therefore removing any duplicate nests. The resulting mosaic is one rectangular image showing the forest canopy, with GPS information embedded, covering an area of around 1km by 100m, complete with red circles indicating unique nest locations. This image is then imported into GIS software where I overlay the GPS coordinates for each nest we found during our ground survey of that transect. Zooming in, I am able to see an estimated number of potentially ‘matched’ nests – those found both by drone and by ground survey – as well as the nests that were only found using one of the survey methods. To take this one step further, I then go to each GPS point for a nest we found on the ground but that did not seem to have been found by drone. I pinpoint the location, open the original image and search that area to see if a nest is visible but not initially detected or positively identified as a nest. This extra step allows us to get a rough estimate for observer error when manually searching images for orangutan nests. Eventually, once the images for all 50 transects have been searched and results analysed using GIS software, we will be able to use our final nest counts, along with data collected from the ground survey, to formulate a new calculation, converting drone nest counts to orangutan population density and estimated population size.



*Example of how unique nests can be visible in several consecutive images. Typically, a nest will first appear at the top of an image, moving down in consecutive images before dropping off the bottom. Great care must be taken by observers to ensure no duplicates are missed so that all nests are circled in the resulting orthomosaic and ready for further analysis.*

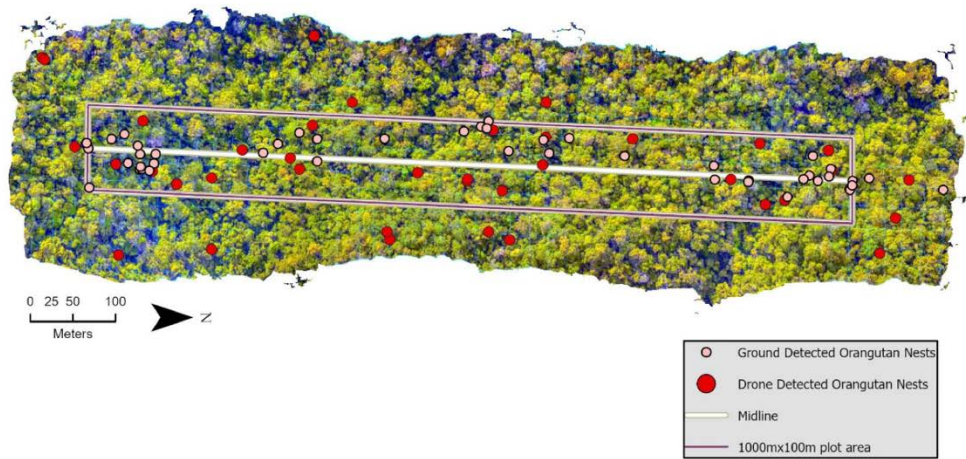
Searching for nests in these images might not sound like a difficult task, but it can very much like looking for a needle in a haystack. Observers have to confidently differentiate an orangutan nest from broken tree branches, or epiphytic plants (small leafy plants that grow on the surface of a tree), or just simply from discoloured, dead leaves within the canopy. From a bird’s eye view, from far away, this is not as easy as it sounds! We are now building a database of nests that we have confirmed with certainty through comparing GPS points with nests we saw close up on the ground which will allow easier training for nest identification in the future.



*Four zoomed in examples of nests found in drone imagery so far. Size, position, colour and visibility vary substantially between nests so observers must take great care to carefully zoom in and check each suspected nest they come across.*

Additionally, and perhaps most excitingly for the future application of this potential method, we are currently using our dataset to assist conservation drone expert, Dr. Serge Wich, from the University of Liverpool, UK, in his work on an automated technique for nest detection in drone imagery through artificial intelligence software. Our tagged nests will be used as part of this larger project to build a database aimed at training this AI program to automatically detect nests in drone imagery. The success of this software would be instrumental in the practical application of using drones to survey orangutan populations, reducing the time spent analysing imagery and allowing surveys to take place more frequently so that populations of this critically endangered ape can be better monitored through time.

So, although the time investment in this project is long and the work ever so slightly tedious, our team are excited to see the results and are already hopeful that this method will indeed be a realistic tool for the long-term monitoring of orangutans across their entire range.



Example of a completed orthomosaic after overlaying both drone and ground nest points for comparison.

*“Change is not a linear process; it's an all-encompassing process,  
and it's alive in different ways”*

*- Genesis P-Orridge*

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