Dear Friends and Supporters,

A new school year is just about to begin here in Boston, after a great summer of connecting in person with our amazing team in Indonesia and the beloved orangutans in Gunung Palung National Park.

This month marks the 30th anniversary of the Gunung Palung Orangutan research project. In this issue of *Code RED*, I reflect on some of the changes over the past 30 years as well as how the continuity of data collection allows us to answer questions about orangutans across their lifespan.

We also hear from Edi, our Field Director, about our annual celebration of World Orangutan Day a couple of weeks ago. We use special days like this to foster excitement about the environment and orangutans, embedding important conservation messaging and education in fun community-based activities.

Wishing all those beginning a new school year a healthy and exciting Fall.

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Cheryl Knott, PhD
Executive Director
Gunung Palung Orangutan Conservation Program (GPOCP)

Spreading Love for Orangutans: World Orangutan Day 2024

By Edi Rahman, Field Director

The wild orangutan population in West Kalimantan has been on the decline in recent decades due to the loss of lowland forests. In our mission to save wild orangutans, we recognize that the wellbeing of orangutans is intricately connected to the wellbeing of people, forests, and other organisms. The destruction of orangutan habitat can be disastrous for the wider community, and thus, the entire ecosystem must be cared for. Saving orangutans and their habitats means ensuring the welfare of the human community, because a well-preserved orangutan habitat will ensure the continuity of important ecological services needed by the wider community. This idea drives our work at Yayasan Palung, and this year for “World Orangutan Day,” it permeated all of our special events.

Simon, our Environmental Education Coordinator at our Bentangor location, gives a presentation about orangutans and local wildlife to school children for World Orangutan Day.

Ketapang Regency and North Kayong Regency are adjacent districts, and our programs operate in both regions. The forests in these two districts, especially the lowland swamp forests that are scattered throughout, are habitats for wild orangutans. With the prevalence of mining and plantations throughout the region, this precious orangutan habitat is under threat. This is especially concerning for the orangutans that exist outside of protected areas.

Every August we are all invited to focus on the protection of orangutans and their habitats by commemorating "World Orangutan Day" which happens on August 19th every year. Yayasan Palung always hosts a variety of special activities to draw attention to environmental issues and increase conservation awareness in commemoration of World Orangutan Day.

Education staff put on a puppet show for children as part of World Orangutan Day festivities.

The theme this year was "Love for Orangutans" or “Cinta untuk Orangutan” to emphasize the importance of our affection and concern for orangutans as living creatures who deserve protection and welfare. In addition, it also invites all of us to commit to maintaining and protecting the habitat and ensuring the survival of orangutans.

Yayasan Palung spread the message through a wealth of programming, both online and in person. We highlighted the various challenges that orangutans and their habitats face, namely development and industry, illegal trade, hunting and consumption, forest fires, and habitat fragmentation.

Our Environmental Education Program commemorated this day through a variety of school events from August 18-23rd 2024. The celebration began with one of our conservation youth groups, Bentangor Kids, hosting activities at State Elementary School (SDN) Number 19 Pampang Harapan Village in Sukadana District, and SDN Number 08 Matan Hilir Utara District, Ketapang Regency, SDN Number 19 Nanga Tayap District, Ketapang Regency and several other schools. The festivities included lectures, puppet shows, a mobile cinema and discussions. There were fun competitions like guess the name of the animal from the picture, guess the animal from the characteristics, complete a puzzle of animal drawings, and knowledge tests about the environment. We also conducted radio campaigns on government radio in Ketapang and North Kayong districts.

A flyer for our World Orangutan day radio show featuring our Environmental Education Field Officer, Riduwan.

One of the highlights this year was the enthusiastic involvement of our West Bornean Orangutan Caring Scholarship (WBOCS) recipients. They carried out oration activities, street campaigns, and social media videos to spread messages about saving orangutans and their habitats. Our Animal Protection team participated in the World Orangutan Day webinar organized by another local organization, Satya Bumi, which discussed various threats to orangutan habitats, solutions to protect these areas, and increased public awareness of the importance of forests and orangutans. Yayasan Palung was given the opportunity to give a presentation titled, "*The Role of Village Forests as Orangutan Habitat and the Potential Threats they Face"* which was delivered by Erik Sulidra, the manager of our Animal Protection Program.

The sub-districts that we targeted to bring the many World Orangutan Day activities to, are all areas where there are still orangutan habitats and populations, but they lie outside the boundaries of Gunung Palung National Park. Thus, it is so important to share this “love for orangutans” to ensure that these areas are protected through a culture of conservation and sustainability, and an emerging generation of environmentally conscious leaders.

Group photos commemorating our events in some of the villages for World Orangutan Day, hosted by our Education staff and Youth Group volunteers.

Thirty Years of Continuity and Innovation: The Gunung Palung Orangutan Project Celebrates a Major Milestone

By Cheryl Knott, Executive Director

As I wrapped up my field season this August, I was reminded of another day, the 14th of August 1994, the day the project officially began 30 years ago. It hadn't rained in months, and the river

was extremely low, so we mostly walked and pulled the three small wooden canoes loaded down with gear as we followed the *Air Putih* river into Gunung Palung National Park. I was there to begin a year and a half of field work on wild orangutans, and my husband Tim Laman, was beginning post-doctoral research on the role of strangler figs as keystone species in the rainforest. Having only paddles for our canoes, we didn't make it up that first night and had to sleep on a tarp on the river bank that evening. As our small caravan wound its way upriver I distinctly remember the red dipterocarp flowers that came floating out of the Cabang Panti Research Station, heralding the mast fruiting that helped launch the project. When I started my journey, I didn't know that 30 years later I would still be here, but by the end of those 18 months I knew this would become a life-long passion and commitment.

Cheryl helps pull the canoe upriver, while field assistant, Uthay, pushes from the back. Photo © Tim Laman.

That year, as I established my PhD research, I set up the foundational data collection and processing protocols that we follow thirty years later. We still collect our basic data on orangutan activities, tree and body positions, and feeding behavior the same way. This gives us the powerful ability to look at changes across time, both within and across individuals. Some procedures have definitely gotten better. We now have freezers on site, and so in addition to the method I developed to dry urine on filter paper, we can now freeze it to preserve for later analysis. Over the years we've added to our data collection repertoire, including new techniques introduced by student researchers, with many becoming part of our standard data collection. We now process everything you can think of from fecal samples to understand the process of digestion. Dr. Caitlin O'Connell brought the on-site analysis of fecal parasites, which has continued under Indonesian Laboratory Assistant and Assistant Manager Ishma Karimah. Dr. Andrea Blackburn and Research Manager Ahmad Rizal introduced studies of seed dispersal. We now use thermal drones to regularly search for orangutans, spear-headed by Research Director Tri Wahyu Susanto. The research has benefited from the contributions of many more graduate and undergraduate students, such as Dr. Andrea DiGiorgio who used tree climbing techniques to augment our dataset on the nutrient composition of orangutan foods. The addition of a thermal camera this summer and continued improvements on our laser camera are examples of the new innovations we bring to the study each year. The project was also built on the foundation laid by earlier researchers, particularly site founder, Dr. Mark Leighton, who set up the trail system and introduced our methodology for assessing plant phenology (flower and fruiting cycles). I've also been incredibly lucky to share my passion with my family. This summer, my daughter, Jessica, was able to join me for part of the time in the field.

Cheryl Knott with daughter Jessica Laman, Cabang Panti Research Station, July 2024.

The research trail system has more than doubled from 1500 to almost 3400 ha and we now have the Rangkong River Research Station about 6 km from camp as well as research in all of our customary forests. Bioacoustic monitoring, camera traps, and collection of temperature and rain data now occur at 14 different sites. This summer we set up Star Link at both of our research stations, allowing much better communication with the outside world. We have gone from a simple research structure to a research compound, with labs and running water, but we still have open air buildings and the same sense of community that has made this such a special place for scores of Indonesian and foreign researchers and staff over the years.

The research staff celebrate 30 years of orangutan research by imitating the cheek pads of flanged males.

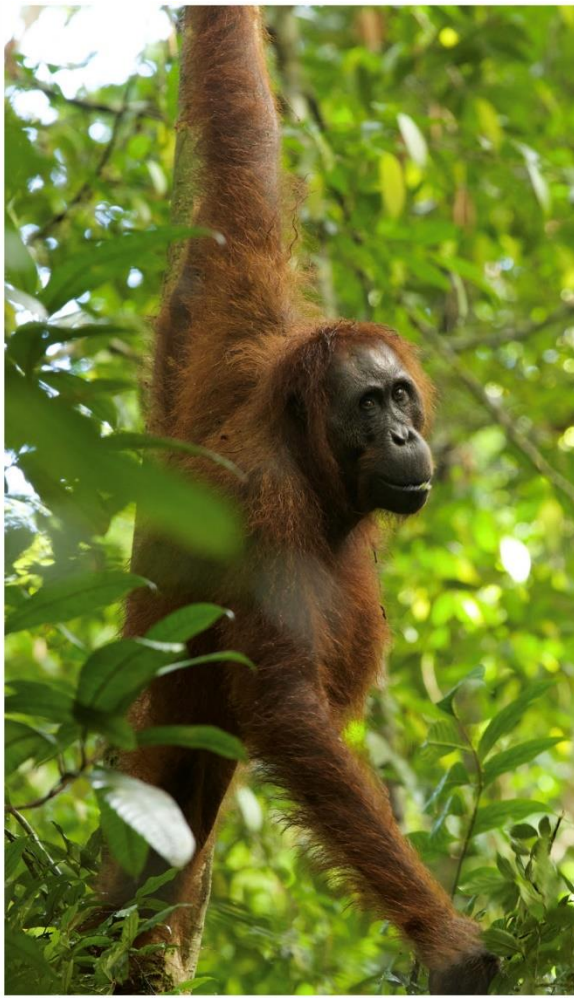
There are some things that I dreamed of doing 30 years ago, that we are only now able to realize. Back in 1994 the possibility of getting DNA from wild primates was just starting to be thought of and the best method to preserve a sample was still being worked out. That first year I tried collecting hair from nests, preserving urine using sodium azide, and preserving fecal samples in ethanol. Now these procedures are well established and thanks to the work of Dr. Amy Scott we now have genetic identities of 42 of those individuals. The dream I had in 1994 of being able to bring full laboratory into a field setting became a reality this summer, when PhD student, Zoe Albert, assisted by Indonesian counterpart Ziyadatul Khoiroh, were able to successfully extract DNA from the gut microbiome of wild orangutans, conduct PCR analysis and sequence DNA in our field lab.

Zoe Albert and Ziyadatul Khoiroh celebrate a successful 16S PCR and gel electrophoresis in which they were able to visualize their newly amplified DNA

Instead of filling out paper data sheets and drawing orangutan travel routes on maps by hand, we now use iPads for data collection and GPS units to mark our location. But yet, the day-to-day reality of following orangutans wherever they take us, across swamps, up steep slopes and into ravines hasn't changed and I was lucky enough to spend time with some of our most habituated orangutans this summer. Alfred, who has been the dominant flanged male at the study site for many years now was found during my first day in the field. But, how he has changed! Alfred has become a past-prime male, smaller, no longer with firm cheek pads, and traveling mostly on the ground. He was sporting newly healed scars, evidence of altercations with other males. This transformation from prime to past-prime male is one that we've seen other males go through. With 30 years of behavioral and energetic data we can now document the life histories of these individual animals and better understand the costs and benefits of male bi-maturism – the existence of two types (flanged and unflanged) of adult male orangutans.

Alfred forages on an understory plant, Salacca affinis*, July 2024. Photo by Tri Wahyu Susanto.*

The project started out 30 years ago with the aim of understanding, through collection of hormonal and energetic data, why orangutans only give birth once every 7-8 years. Bibi, our most habituated female orangutan, exemplifies this long maternal investment and I got to spend many days with her this summer. Now pregnant with her third offspring, we used pregnancy tests and our knowledge of changes that occur in orangutan genitalia with pregnancy to try and pinpoint when conception might have occurred and thus judge her expected due date. Interestingly and unusually, Bibi spent many hours traveling on the ground this summer, feeding on gingers and other ground vegetation during this fruit-poor period. Meanwhile, back at Boston University, Amy, now a post-doc, was trying out a new method of extracting DNA from our oldest urine and filter paper samples to genetically match up current individuals with those from the beginning of the study. I was thrilled when the news came in that she had matched up Bibi with Eminel – a juvenile female that we had followed in the early 90s. Now we can confirm that Bibi is about 36 years old. I am excited that we can now establish the lifespan of many of the wild orangutans we've followed. Understanding the behavioral and physiological changes that occur with aging is now possible with our long-term data set and will be one of our prioritized project aims over the next few years.

Left: We now know from genetic analysis that Eminel (the juvenile on the bottom) is our most habituated orangutan, Bibi. Here she is with her mother, Elizabeth, and baby sister Erna. First published in National Geographic Magazine, August 1998, Orangutan in the Wild, by Cheryl Knott and Tim Laman. Photo © Tim Laman. Right: Adult female, Bibi, now pregnant with her third offspring, forages on the ground, July 2024. Photo by Tri Wahyu Susanto.

Those banked thirty year samples are also allowing us to ask other novel questions. Also back at BU, graduate student Samantha Vee has been working out the procedures in our lab for measuring neopterin – a marker of immune function – and something we can now look at in individuals as they pass through various life history and ecological events. Undergraduate, Amanda Wu, is also using these samples to see if we can detect any microplastics in orangutan urine, and if so, chart those changes over times. Through the continuity of data and samples we can connect the past and the present, asking new questions, and performing new analyses that hadn't occurred to us, or that weren't possible before. We have built up an incredible dataset of 30 years of behavioral data on wild orangutans, with matched biological samples, and documentation of their changing ecosystem. As we answer questions that have puzzled us for years and ask new questions that haven't occurred to us yet, I feel incredibly hopeful for our next 30 years of orangutan research.

Management of Cabang Panti Research Station is conducted by the Gunung Palung National Park Office (BTN-GP) in collaboration with GPOCP/YP. Scientific research is carried out in conjunction with the Faculty of Biology at Universitas Nasional (UNAS) and Boston University.

“Come forth into the light of things, let nature be your teacher.”

— William Wordsworth

Our Contact Information
Gunung Palung Orangutan Conservation Program
P.O. Box G
1661 Massachusetts Ave
Lexington, MA 02420
1-617-353-7723
https://www.savegporangutans.org/

Yayasan Palung
Jl. Kol. Sugiono, no. 28, RT 013/RW 05 Sampit,
Kec. Delta Pawan, Kabupaten Ketapang,
Kalimantan Barat 78811, Indonesia
www.yayasanpalung.com