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# THE JUNGLE TIMES

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# Regrow Borneo Update



The Laab site one year ago (pre planting).  
(Credit: Regrow Borneo)

The Laab site now, one year later (after planting). (Credit: Regrow Borneo)

As the Regrow Borneo project approaches the end of its third year, huge leaps forward have been made. We have finished our carbon sampling for the year, and have completed the above ground carbon sequestration calculations for two of our sites. We can report that  $7.3 \pm 6.7$  Mg/Ha of carbon has been sequestered at Kaboi Lake, and  $6.2 \pm 3.4$  Mg/Ha of carbon has been sequestered at Ladang. Our biodiversity monitoring for the year has also been completed, and the pre-planting species diversity of amphibians, small mammals, canopy birds and dung beetles have been recorded at Laab Swamp, Kaboi Stumping and Sungai Pin. We have already seen huge improvements in forest cover at some of our sites since 2021, fueling our fire to keep the work going into 2023!

For full information see the Regrow Borneo annual report 2021-2022 which can be downloaded from the following link:  
<https://tinyurl.com/Regrowborneo>



As part of the carbon sampling root samples are taken at depth intervals of 0-10cm, 10-25cm and 25-60cm. (Credit: Rhiannon Peacock)



Separating the soil from the roots can be a very muddy task as seen here at the Ladang site. (Credit: Rhiannon Peacock)

# Meet the Pangolins



Galak (Credit: JiaZhen Lim)



Raya (Credit: JiaZhen Lim)

A key part of the pangolin project at Danau Girang Field Centre (DGFC) is the successful trapping, radio tagging and tracking of Sunda pangolins in the Lower Kinabatangan Wildlife Sanctuary (LKWS). One such pangolin, who is still currently being tracked, is an adult male Sunda pangolin called Galak. Galak was initially tagged in March 2021, after being found by pure chance outside the DGFC centre one night. "Galak" is the Malay word for strong - which he was named because of the physical challenge faced by the vet and researchers when trying to initially tag him! Pangolins are an elusive and solitary species, making them difficult for researchers to find, capture and study. This chance encounter was essential, as it allowed the pangolin project to be launched, with Galak serving as the primary source of data.

However, this all changed in November 2022 when DGFC was informed of a young adult male pangolin that had wandered into a school in Kampung Bilit, a small village on the Kinabatangan river. A team of researchers were able to safely capture, tag and release the pangolin within the LKWS near to the centre, naming him "Raya", because he was rescued on the day of the General Election (Pilihan Raya in Malay). Increasing the number of radio tagged pangolins is a key aim for the project because researchers can then get a more comprehensive idea of pangolin behaviour.

This has certainly been the case for Galak and Raya, both of which have exhibited very different behaviours. Being caught and released in the vicinity of the field centre, Galak already had a pre-existing network of nearby sleeping sites in tree holes and burrows, which were discovered by tracking him over time. On the other hand, Raya was released in an unfamiliar environment, and so has had to establish new sleeping sites himself. Initially, Raya headed along the river back in the direction of Kampung Bilit, however, he has since settled in the vicinity of the nearby oil palm plantations, sometimes sleeping at the top of the palm trees. This is a unique situation to study, and it will be interesting to see whether Raya continues to travel, or if he will create a new home range by establishing his own network of sleeping sites.

# Dr Reza Joins the Team



Dr Reza (Credit: JiaZhen Lim)



Radio tag tracking in a plantation  
(Credit: JiaZhen Lim)

Born and raised in Selangor, West Malaysia, Dr Mohamed Reza Tarmizi (we know him as Reza) is DGFC's new resident vet. His interest in the anatomy of veterinary medicine was influenced by his childhood experience of growing up with pets and caring for them when they were sick. Reza's studies began at University Putra Malaysia (UPM) studying Animal Health and Agriculture, before undertaking a Degree in Veterinary Medicine.

After graduating, Reza worked as the vet and curator of the Reptile House at Zoo Negara, Kuala Lumpur, moving on to work in various zoological institutions including: Singapore Zoo, Aquaria KLCC, Melaka Zoo and as part of the vet faculty at University Malaysia Kelantan. Reza has also worked with the critically endangered Bornean Rhino, where, alongside the Bornean Rhino Alliance (BORA), he was tasked to apply Assisted Reproductive Techniques (ART) to the last three Bornean Rhinos in Tabin Wildlife Reserve, Sabah.

It was during his time working with BORA that Reza first heard about Danau Girang Field Centre (DG) and attended the DG Sunda Clouded Leopard Action Plan Conference in 2017. A friend had also previously worked with DG and feeling keen to work more closely with wildlife – Reza applied for the vacancy on the website.

The first month at DG was challenging as everything was new. Reza has learnt a lot during his time here so far: piloting the boats, utilising GPS and telemetry, jungle trekking and operating trail cameras. Reza is currently attached to the Small Carnivore Programme, led by PhD student Amanda Wilson. Reza's main role in this project involves the live capture and fitting of the cat's radio collars (in particular the elusive flat headed cat), ensuring that safe anaesthetic protocols are followed. In addition to this, Reza hopes to undertake a project which looks at the negative impacts which are posed by the presence of free roaming domestic animals on wildlife, particularly to wild felids.

Finally, in his free time Reza likes to tinker and restore items, which has led him to a hobby in fabrication using CAD and 3D printing. He also has an interest in collecting and processing animal skulls which he hopes will be of use for future work.

# A Wild Weekend at Tanjung Aru State Library



(Above) Prizes were awarded to the children for the interactive games and activities. (Credit: DGFC Education Team)

(Below) A variety of activities were on offer, such as the colouring in of Sabah's incredible wildlife. (Credit: DGFC Education Team)



On 10<sup>th</sup> December, Danau Girang Field Centre (DGFC) and the Sabah State Library hosted a joint initiative called "A Wild Weekend at Tanjung Aru State Library". The event targeted children as well as university students, providing an opportunity to learn more about the incredible wildlife and forests of Sabah and meet the researchers trying to protect it.

The children listened to talks about the importance of conserving rainforests and the dangers threatening wildlife across the planet and what we can do to help. They took part in some interactive games, an animal identification quiz as well as a selection of hands-on activities and colouring. The results of their artwork were very impressive, and many prizes were awarded!

University students from Almacrest International College and Sabah Foundation University College were also welcomed. The students had the opportunity to engage with DGFC's wildlife researchers who live and work at the Centre. Presentations were given by Cardiff University PhD student Maz. Maz is a Sabahan whose research project is evaluating the carbon and ecological impact of reforestation in Borneo. The second presentation was given by Hong Kong University researcher JiaZhen Lim, who is working on the Pangolin project studying the role of Sunda pangolins in the emergence of viruses such as SARS-CoV-2 in humans. The following discussion also allowed the university students to appreciate and better understand what life in the field of conservation research is really like.

A big thank you to the DGFC education team and Sabah State Library for hosting a wonderful morning and many thanks to the children, parents and students who attended.



Make your own bookmark station (Credit: DGFC Education Team)



Maz delivering her presentation (Credit: DGFC Education Team)

# SENSOR Project Pilot Study



L-R: Emily Dziedzic, Emilia Johnson, Benny Obrain Manin, Mit Zuraimi, Mesach Lee, Bryce Davey, Addy Samsudin  
(Credit: Amaziasizamoria Jumail)



Mosquito species identification and sorting  
(Credit: Mesach Lee)



Mosquito trap setup. The traps were deployed at a different site each day.  
(Credit: Addy Samsudin)

In mid-November Danau Girang Field Centre (DGFC) welcomed a team of researchers from the SENSOR project (a 5 year collaboration between the University of Glasgow and Universiti of Malaysia Sabah (UMS)) for a week-long pilot study. From UMS was senior lecturer and expert in medical entomology Dr Benny Obrain Manin. From Glasgow University was PhD student Mesach Lee (who is studying the effects of reforestation on mosquitoes and diseases in Sabah) and research assistant and spatial epidemiology masters graduate Emilia Johnson. Also part of the team was Oregon State University PhD student, molecular ecologist and DGFC friend Emily Dziedzic and Addy Samsudin, a local expert and project manager for the study.

Changing landscapes and environments can increase the risk of disease transmission between wildlife, insects and people. For example, malaria is spread by the transmission of single celled parasites known as plasmodium. In Malaysia, the predominant malarial parasite (*Plasmodium knowlesi* (Pk)) is usually found in macaques, but in 2004 was discovered to pose a risk to humans. The disease ecology of Pk was previously investigated by the MONKEYBAR project, which DGFC was involved in. The aim of the SENSOR project will be to build upon previous research and continue to understand the pathways of emerging infectious diseases and suggest solutions for protecting and monitoring human and environmental health.

The attraction of the forest around DGFC for the study is because of the reforestation gradient that has been established, with several reforested plots up to twenty years old. Explained by PhD student Mesach "As reforestation happens, we predict the species composition of mosquitoes will change. So, areas recently reforested should have different species composition to the earliest reforested areas. By looking at the differences we can assess the risk of humans catching disease." During their stay the team tested out mosquito collecting traps at the various reforestation sites; with the aim of eventually being able to sample mosquitoes up at the canopy level. This is important because the mosquitoes which would usually feed on macaques (who are natural hosts of Pk) can be found at this level.

The weeklong pilot ended with a birthday celebration for Mesach and a primate river trip where a troop of langurs made a memorable appearance for the group.

# Inge and Bryce's Volunteer Experience

Hey, I am Inge, I am 23 and I am from the Netherlands. I am currently studying for my masters in Biodiversity and Sustainability at Leiden University. My special interest is biodiversity conservation, particularly herpetology. Finding frilled tree frogs and spotting crocodiles in DGFC has furthered this interest. I discovered DGFC through my university after looking for fieldwork opportunities as I missed it during my undergraduate studies. I have always been interested in animal research, especially in the Tropics which is why DGFC was a perfect fit. During my month-long stay I have gained lots of field skills by learning from the staff and scientists at the centre as they conduct many amazing projects. Assisting with the pangolin tracking, bat surveys, and carbon sampling have all been highlighted during my stay. I want to thank everyone at DGFC, I have loved the experience and hope to come back soon.

**Inge van  
Frankenhuizen**



(Credit: Bryce Johnson)

**Bryce Davey**



(Credit: JiaZhen Lim)



Hey I'm Bryce, I'm 26 years old and I'm originally from West Wales. Growing up with two wildlife photographers for parents I was fortunate enough to travel all across the world from a young age and experience so many cool environments. However, despite my upbringing my main passion has always been engineering and I graduated from Lancaster University with a degree in Sustainable Engineering in 2017. I then got a job with a new start-up in South Wales developing air quality sensors for remote and harsh environments. Back in June of this year I came to DGFC to install these sensors for monitoring air quality so this data can be correlated with animal migration patterns. When I first arrived it was only a few minutes into the boat journey down river that we saw elephants climbing out the river which was an amazing sight. This first stay was only 15 days long, but during which time I was also able to take part in projects such as Regrow Borneo. I enjoyed my time so much I decided to come back to DGFC as a volunteer in October for nearly three months and continue to help with the ongoing projects but also offer my engineering skill set to the team.

Bryce carrying out a drone survey (Credit: Bryce Davey)

# Hannah's PTY Project

*As part of the Professional Training Year (PTY) placement, Cardiff University students undertake their own research project. Each new issue of the Jungle Times will feature one of these projects so you can learn more about what our PTYs are up to! The first featured project is Hannah's - who will be comparing the efficacy of different frog sampling techniques.*



Hannah and a Harlequin tree frog (Credit: Hannah Shapland)



Cinnamon frog (Credit: Hannah Shapland)

The Lower Kinabatangan Wildlife Sanctuary (LKWS) is a 270km<sup>2</sup> sanctuary comprising 10 forest lots of varying degrees of historical disturbance predominantly dominated by oil palm plantations. Despite extensive forest fragmentation and degradation, the LKWS supports an incredibly high amount of biodiversity and is, therefore, the ideal natural laboratory to evaluate the impacts of habitat fragmentation on wildlife populations.

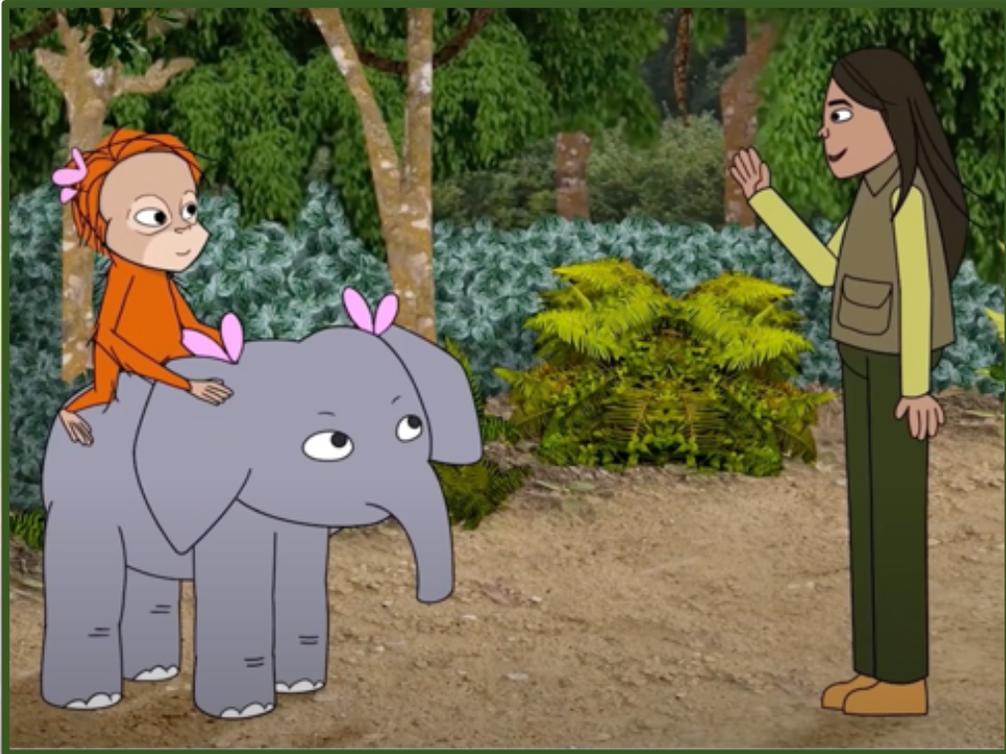
I have always had an interest in herpetology (the study of reptiles and amphibians) as these groups show incredible diversity from physiology to behavioural habits. For my study, I have decided to focus on frogs. They are excellent ecological indicators because they are sensitive to climatic fluctuations and therefore reveal the effects of even small changes to a habitat. The wide variety of frogs in the Kinabatangan also makes them a good group to study as they utilise many different ecological niches. For example, reproduction is achieved in a multitude of ways, with some frogs, like the jade tree frogs, forming foam nests on leaves overhanging water while others, like the rough guardian frogs, transport their tadpoles on their backs to water sources. From litter-dwelling frog species to those high up in the canopy, frog species have different habitat requirements and it's important we preserve those habitats which support the highest biodiversity.

This is what led me onto my project as I am comparing different ways to sample frog species. Active surveys, which involves walking transects and identifying species along them, is the traditional and standard method which is being used in DGFC for projects such as Regrow Borneo. A second but much newer technique (which is now being deployed) are acoustic recorders called AudioMoths, which record frog calls from which species can be identified.

The aim of my project is to compare both these techniques to see whether the AudioMoths can detect the same species composition as the active surveys; this can lead to ongoing frog monitoring that requires fewer staff and volunteers in the field and therefore larger standardised data sets can be acquired because the presence or absence of species at sites would be known with less sampling effort.

As a still relatively new technology, the accuracy of acoustic monitoring needs to be investigated before widespread deployment. Moreover, acquiring larger data sets of frog calls and the development of sophisticated programmes for their analyses is important because this could uncover new findings such as climatic conditions and patterns in breeding seasons or even the calls of new and previously unidentified species.

# Maz's Agents4Change collaboration



Utti, Elly and Maz (Credit: Agents4ChangeClub Youtube Channel)

Regrow Borneo was featured in a recent Agents4Change video which starred our very own scientist, Ms Maz! Maz explained to Agents4Change's Utti and Elly the importance of tree-planting efforts to combat climate change and what each and every one of us can do to get involved. Check out the video to learn more!

**Youtube URL:** <https://www.youtube.com/watch?v=bwnG6iqIEN8>

Agents4Change is an online educational program being piloted in Malaysian schools which teaches children about the United Nations Sustainable Development Goals and global citizenship. The series is produced by Siung Films in collaboration with UNICEF, The Malaysian Ministry of Education, Environment Protection Department Sabah and the Institut Pendidikan Guru Sabah.



# Publication Corner

## Modifying the diets of captive proboscis monkeys in a temperate zoo to reduce weight loss and renal disease

**Date Published:** 10 November 2022

Published in the journal *Primates*, research was conducted into the high number of renal failure cases and weight loss in captive proboscis monkeys in Yokohama Zoological Gardens in Japan; a problem which reoccurs in many temperate zoos. Calcium and phosphorus levels as well as weight were monitored before and after the diet modifications to determine whether the cause was related to calcium and phosphorus concentrations. These levels were then compared to free living proboscis monkeys. Results concluded that the renal failure might be due to the high calcium and phosphorus content in the leaves being fed to the captive monkeys in winter and autumn.

## Determinants of sun bear *Helarctos malayanus* habitat use in Sabah, Malaysian Borneo and its predicted distribution under future forest degradation and loss

**Date Published:** 02 December 2022

New research published in *Biodiversity and Conservation* used existing camera trap data to understand sun bear habitat patterns and predict their future distribution across Sabah under different scenarios. Large mammals, like sun bears, are particularly threatened by habitat loss and poaching; and only half of Sabah's sun bears are found within protected areas. The study recommends long term monitoring of the suitable habitats for sun bears, particularly outside protected areas, and strong anti poaching efforts.

## Whole genome analysis of clouded leopard species reveals an ancient divergence and distinct demographic histories

**Date Published:** 22 December 2022

**Open Access:**

<https://www.sciencedirect.com/science/article/pii/S2589004222019198>

Published in *iScience*, new research on the whole genome of the two clouded leopard species reveals that the genetic diversity is lower in the island species, the Sunda clouded leopard (*Neofelis diardi*) compared to the mainland clouded leopard (*Neofelis nebulosa*). Moreover, ancient divergence between the two clouded leopard species predates that of leopard and lion. Genetic analysis in the future will be crucial to monitor their populations and consequent inbreeding, with the possibility of subspecies needing to be introduced. This paper is available open access.

# Photo and Camera Trap Highlights



**Sunda Clouded Leopard.** They stopped for a yawn before spotting our camera.



**Frilled tree frog** (Credit: Rhiannon Peacock)



**Long Tailed Macaque.** A cheeky grin for the camera. (Credit: Rhiannon Peacock)



**Harlequin flying frog** (Credit: Hannah Shapland)



**The staff enjoyed a new years eve barbecue at the jetty.** L-R: Nita, Zara and Bryce. (Credit: Jack Gibbon)



**Leopard Cat.** They aren't usually spotted on the Batangan ridge, preferring the surrounding plantations for ease of hunting.



**Crested Serpent Eagle.** Curious about our camera trap.



*Danau Girang Field Centre*

*Danau Girang Field Centre was opened in July 2008. It is located in the Lower Kinabatangan Wildlife Sanctuary, Sabah, Malaysia.*

*Danau Girang is owned by the Sabah Wildlife Department and supported by Cardiff University. Its purpose is to further scientific research with the aim of contributing to long-term conservation projects in the area, and develop a better understanding of our environment and the living things we share it with.*

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