



# RAINFOREST ECOLOGY, BIODIVERSITY & CONSERVATION ON THE ISLAND OF BORNEO, INDONESIA

**Course ID: ARCH 380E**

**July 6-July 26, 2020**

**Academic Credits: 4 Semester Credit Units (Equivalent to 6 Quarter Units)**

**School of Record: Connecticut College**

## **FIELD SCHOOL DIRECTOR:**

**Prof. Frank van Veen**, Centre for Ecology & Conservation, College of Life and Environmental Sciences, University of Exeter, UK; and Borneo Nature Foundation International ([f.j.f.van-veen@exeter.ac.uk](mailto:f.j.f.van-veen@exeter.ac.uk))



## **INTRODUCTION**

The island of Borneo is renowned as one of the most biodiverse places on the planet, home to a large array of endemic species and unique ecosystems, including carbon-rich peat-swamp forests. The Borneo Nature Foundation (BNF) is a not-for-profit conservation and research organisation working to protect some of the most important areas of tropical rainforest in Borneo, and safeguarding the incredible wildlife that is found here. BNF's field programmes include high-quality scientific research as a basis for protecting and managing tropical forests, and we have particular expertise in monitoring the distribution, population status, behaviour and ecology of Borneo's flagship ape species: the critically endangered Bornean orangutan (*Pongo pygmaeus*) and endangered southern Bornean gibbon (*Hylobates albibarbis*). Our wide-ranging biodiversity and forestry research is used to make the case for conservation and demonstrate the harmful impacts of logging and forest conversion. We provide training and capacity building for local students, researchers and conservation-area managers, and work with a number of local partners to implement successful conservation projects.

BNF's newest programme is the Rungan Conservation Programme, where we are working with local stakeholders to protect this critical forest. Until recently, the Rungan Forest was a conservation afterthought, and yet this forest is probably the largest unprotected, relatively-intact forest in central Borneo. Over 3,000 orangutans are thought to occur here, making this potentially a very important site for their protection. The people of Mungku Baru, a small village on the Rungan River, were the first to raise awareness of the need for conservation efforts. Their sacred ironwood forest, rich in wildlife, was at risk from conversion to acacia plantation. Their efforts to engage people led to the local district government, university and conservation NGO's coming together in 2015 to develop plans for protection and community empowerment. The Borneo Nature Foundation (BNF) is taking a lead in these efforts to

protect up to 100,000 hectares in this ecosystem, working together with communities, government and industry stakeholders.

Key to this work is biodiversity and forestry research which we use to make the case for conservation and bring global attention to the region. We use this information to build a case for protecting this important yet threatened forest. The field school will be led by experienced ecologist Dr Frank van Veen together with senior researchers from BNF and local field assistants from Mungku Baru village who have an intimate knowledge of this forest.

#### ACADEMIC CREDIT UNITS & TRANSCRIPTS

**Credit Units:** Attending students will be awarded 4 semester credit units (equivalent to 6 quarter credit units) through our academic partner, Connecticut College. Connecticut College is a private, highly ranked liberal arts institution with a deep commitment to undergraduate education. Students will receive a letter grade for attending this field school (see grading assessment and matrix). This field school provides a minimum of 120 direct instructional hours. Students are encouraged to discuss the transferability of credit units with faculty and registrars at their home institutions prior to attending this field school.

**Transcripts:** An official copy of transcripts will be mailed to the permanent address listed by students on their online application. One additional transcript may be sent to the student's home institution at no additional cost. Additional transcripts may be ordered at any time through the National Student Clearinghouse: <http://bit.ly/2hvurkl>.

#### COURSE OBJECTIVES

The key course objectives are to learn to plan and design the study of biodiversity in a challenging rain forest environment, using a range of field techniques, and to learn how to use the appropriate analytical tools to answer specific questions in the context of forest conservation in Borneo and beyond. The diversity of forest types in the Rungan landscape in particular allows us to address questions on the habitat preference of different species and also on the role that habitat complementarity may play in supporting populations of key flagship species, such as orangutans, and of biodiversity in general. For example, in order to gain information on the population density and distribution in the landscape of orangutans we search for orangutan nests (the animals build a nest to sleep in every evening) along a network of transects, and using some math can work out the population density and seasonal preferences for certain habitat types. To answer similar questions for gibbons we have to use the very different approach of spreading ourselves out over the forest at dawn and listening for their songs (arguably one of the best noises in the natural world!), while studying the distribution of species diversity in the landscape involves a range of specific approaches for butterflies, fish, dragonflies, mammals, birds, trees etc., and you will be taught all of these. Apart from these practical skills we will cover many other elements of tropical ecology, biogeography and conservation and students will observe first-hand the numerous threats to this unique environment and we will discuss the socio-economic driving forces behind them.

Living in a basic camp the Mungku Baru Education Forest in Central Indonesian Borneo, students will do their learning immersed in the rain forest 24hrs/day. This allows them to really get the maximum out of their time in Borneo because they and their enthusiastic instructors are typically learning together from dawn until bed time. Students are encouraged to be inquisitive and additional activities such as night walks and early morning bird watching forays at the request of the students are the order of the day (always under guidance from experienced staff).

### DISCLAIMER – PLEASE READ CAREFULLY

Our primary concern is with education. Traveling and doing activities in the forest involves risk. Students interested in participating in any IFR program must weigh whether the potential risk is worth the value of education provided. While risk is inherent in everything we do, we take risk seriously. The IFR engages in intensive review of each field school location prior to approval. Once a program is accepted, the IFR reviews each program annually to make sure it complies with all our standards and policies, including student safety.

The IFR does not provide trip or travel cancellation insurance. We encourage students to explore such insurance on their own as it may be purchased at affordable prices. [insuremytrip.com](http://insuremytrip.com) or [Travelguard.com](http://Travelguard.com) are possible sites where field school participants may explore travel cancellation insurance quotes and policies. If you do purchase such insurance, make sure the policy covers the cost of both airfare and tuition. See this [Wall Street Journal article about travel insurance](#) that may help you decide whether to purchase such insurance.

We do our best to follow schedule and activities as outlined in this syllabus. Yet local permitting agencies, political, environmental, personal or weather conditions may force changes. This syllabus, therefore, is only a general commitment. Students should allow flexibility and adaptability forest activities are frequently subject to change.

Indonesia is situated on the equator, and therefore has a tropical climate consisting of a wet and dry season. In Borneo, the wet season is usually October to April, and the dry season May to September. The dry season is usually (but not exclusively) a little hotter than the wet season, and obviously not as wet. Both the wet season and the dry season can last longer than expected. Sudden downpours and tropical storms are to be expected.

The Rungan River Landscape is relatively flat and open in places but can be dense and flooded in others. Expect to find walking to be extremely hard work and falling over to be a rite of passage. On top of this the humidity and temperatures are very high. Typical daytime shade temperatures are 32°C at base camp or in the towns and 27°C in the jungle. In the late evenings, however, the temperature can drop by up to 7°C in the forest, so it can feel quite cool compared to town.

Other annoyances and hazards in the forest include leeches (rarely encountered), mosquitoes, thorny plants and biting ants, through to venomous snakes, spiders and scorpions. Before students begin the course, students will have an induction to the forest and training. There will be no mobile signal at the camp and limited electricity.

If you have any medical concerns, please consult with your doctor. For all other concerns, please consult with the project director.

### PREREQUISITES

There are no academic prerequisites for participation in this field school. All the course inductions will be carried out in English, so students must have a good working knowledge of the English language, both written and spoken, for health and safety purposes. This is hands-on, experiential learning and students will involve on-site activities about how to conduct ecological study. This involves physical activity and exposure to the elements and thus, requires a measure of acceptance that this will not be the typical university learning environment. You will get hot, sweaty, tired, bitten by insects, fall over logs and live and study in the outdoors. You will be living in a basic forest camp in shared sleeping quarters, with relatively simple (yet tasty) food. It is therefore essential that students are physically and mentally fit and able to cope in such environment. Students must be adaptable and flexible: students

will be staying long hours in the forest (sometimes starting at 4am), with a multi-national team; and unexpected, potentially last-minute delays, modifications or cancellations to schedules or plans are unavoidable in a jungle environment.

### **LEARNING OUTCOMES**

By the end of the course, we expect that students will be able to:

- Demonstrate holistic knowledge of the ecology and biodiversity of Borneo's tropical rainforests
- Identify the primary forest habitats of Borneo and distinguish the primary floral and faunal characteristics of each;
- Identify key endangered species of Borneo and their primary threats
- Understand ecological study techniques used to document the conservation status of tropical forest ecosystems
- Understand the causes and consequences of climate, land use changes and other anthropogenic threats on Borneo's forests
- Understand the importance of forest ecosystems for human well-being and how both conservation and development affect local communities
- Integrate this knowledge into the development of a conservation management plan, which incorporates local livelihoods, values, and priorities
- Complete a detailed field notebook and brief summary report of forest activities and reflections

By the end of the field school, participants will have acquired knowledge on various ecological survey methods, complemented with knowledge about the socio-economic side of conservation and the importance of community outreach, livelihoods and engagement, to help understand the conservation status of tropical forest ecosystems. Participants will also learn the skills needed to create and administer their own projects in the field. This knowledge and the experiences during this field school will offer a window into a career in conservation biology and an unforgettable experience!

### **GRADING MATRIX**

Student grades from the field school will be assessed based on the following weightings:

- 25%:** Student attends and actively participates each scheduled day, including all lectures, group discussions and forest activities.
- 50%:** Student maintains a field notebook that records lessons learned and insights gained, reflections related to assigned reading and lectures, plus consideration of wider implications. This to be done through daily diary entries and written answers to assigned short essay questions. This must be submitted at the end of the course together with a brief 1-2-page field report that summarizes and highlights key findings and lessons learned.
- 25%:** Undertake group mini-project, demonstrating the ability to clearly define aims, design work to achieve those aims, and carry out proof-of-concept fieldwork. The grade will be based on two group presentations: one during the design stage and one on completion.

### **TRAVEL & MEETING POINT**

We suggest you hold purchasing your airline ticket until six (6) weeks prior to departure date. Natural disasters, political changes, weather conditions and a range of other factors may require the cancellation of a field school. The IFR typically takes a close look at local conditions 6-7 weeks prior to program beginning and make Go/No Go decisions by then. Such time frame still allows the purchase deeply discounted airline tickets while protecting students from potential loss if airline ticket costs if we decide to cancel a program.

Students can book their international and domestic flight together through a travel agency or online flight search engine or fly into Soekarno Airport in Jakarta and then book a return domestic flight from Jakarta to Tjilik Riwut Airport in Palangka Raya. Tjilik Riwut Airport is not an international airport. At immigration in Indonesia, agents will require students to show a return ticket out of the country, so it is necessary to purchase a ticket to leave the country prior to arrival. For international flights, United, American or Asian airlines such as ANA, Japan Airlines are usually the cheapest flights flying from the US to Indonesia. These can be booked using a travel agency, the airline's website or cut-price websites, like [expedia.com](http://expedia.com), [skyscanner.com](http://skyscanner.com) or [priceline.com](http://priceline.com).

Students need to book their flight to arrive into Palangka Raya on the start date of the course and BNF requests students to book either the Garuda flight departing from Jakarta at 1455h or the Lion Air flight departing at 1140h. BNF also requests students to book the Garuda flight from Palangka Raya to Jakarta departing at 8:20am or the Citilink flight departing at 9:25am on the day the course finishes.

Please be advised, if students choose to book other flights, BNF will not be responsible from transport to and from the airport and hotel, and students will be required to arrange their own transportation to the hotel in Palangka Raya. BNF recommends ensuring at least four hours between your domestic arrival/departure time and international arrival/departure time for transferring at Jakarta International Airport. BNF requests all students to send a copy of their itinerary to [join@borneonature.org](mailto:join@borneonature.org) at least two weeks prior to their arrival to arrange meeting at the airport.

Upon arrival, students will be greeted at the arrivals exit of Tjilik Riwut Airport.

If students miss their connection or flight is delayed, BNF asks students to call the number listed on the Syllabus or contact [join@borneonature.org](mailto:join@borneonature.org). A local emergency cell phone number will be provided to all enrolled students.

## **VISA REQUIREMENTS**

For participation in the course, students are required to obtain an Indonesian Social-Cultural Visa from the nearest Indonesian Embassy or Consulate in the student's country of origin or residence. BNF will be in contact with students approximately two months prior to their departure to send over the Social-Cultural Visa instructions and documents required from BNF to support the visa application. Under the conditions of the Social-Cultural Visa, students are only permitted to participate in activities related to BNF and travelling around the country after the course strictly as a tourist. This means that students are not permitted to travel before the course on this visa or volunteer/participate in activities with other organisations within Indonesia. If students wish to travel before the programme within Indonesia, students will need to enter Indonesia on a Visa-On-Arrival. Students would then need to leave the country to apply for the Social-Cultural Visa sponsored by BNF's Indonesian counterpart at an Indonesian Embassy in Singapore or Malaysia and re-enter Jakarta using this Social-Cultural Visa. If students do wish to travel after the course, BNF just requests your travel information for the duration of your stay within Indonesia to inform BNF's Indonesian counterpart (sponsoring the visa) of your plans after the activities with BNF have ended.

There is one Indonesian Embassy located in Washington DC and five Indonesian Consulates in the US, which are located in Chicago, Los Angeles, San Francisco, New York and Houston. Students should refer to this website to determine which embassy or consulate to apply through to obtain their visa based on the jurisdiction of each consulate: <http://www.embassyofindonesia.org/index.php/2016/01/24/list-of-consulates-general-of-the-republic-of-indonesia-in-the-united-states-of-america/>. After students have been accepted on the course, BNF will need the students to send over a copy of their passport and CV and confirm which embassy/consulate they will be applying to so the appropriate support letter from BNF's Indonesian counterpart can be prepared. **NOTE:** Passports must have at least 6 months validity

and at least two blank pages for visas (amendment and endorsement pages cannot be used for visa purposes). BNF are responsible for providing the support letter from BNF's Indonesian counterpart and photocopy of the identify card of the Indonesian sponsor, both of which are required for the visa applications. In addition to these two documents, students will need to provide:

- Two recent colour passport photo (4cm x 6cm) (white background)-do not staple or affix to the form;
- Completed online application form (in duplicate)-complete online first to register your application (see instructions below) but then send in the application as well with these documents from the link at the top of the page;
- Copy of your US state license;
- Copy of Green Card (for non-US citizens);
- Travel itinerary-both inbound and outbound to prove that you will be returning to the US and leaving Indonesia before 60 days;
- Proof of financial support (bank statement minimum of \$2000);
- For the embassy in Chicago, students will also need to obtain a letter from their university acknowledging their participation in the course.

Prior to sending in these documents, students will need to complete an online application to register their visa application through this link: <https://consular.embassyofindonesia.org/>. Below are instructions for how to fill out the Online Application Form:

Scroll below on the page and click on Visit Visa-Socio Cultural to Indonesia. To the right of the page (after you have again read through the instructions), you can click on start your application.

To start, you need to choose the state you live in, which should then correspond to the correct embassy you have already listed on your support letter from Indonesian sponsor. Then print the registration number you are given for future reference.

**Purpose of Visit:** Social

**Visa Type:** SINGLE

**Length of Stay:** State the length of time you will be spending in Indonesia with BNF (maximum for Social Cultural is 60 days). NB: If you are travelling in Indonesia after you leave BNF, you will need to leave the country and return on a Visa on Arrival.

**Point of Entry and Departure:** Jakarta

Fill in your travel information below

**Address in Indonesia:** JALAN SEMERU No. 91, City: PALANGKA RAYA 73111; Province: KALIMANTAN TENGAH; Tel: 0536 3221429

Sponsorship in Indonesia:

**Type of Sponsor:** OTHER

**Organization Name:** UNIVERSITAS MUHAMMADIYAH PALANGKARAYA

**Contact Name:** Ibu Mariati

**Address:** JALAN RTA, MILONO KM. 1.5 City: PALANGKA RAYA 73112; Province: KALIMANTAN TENGAH; Tel: 0536 3222184

If you have flight details please fill them in at the bottom – if not leave the section blank. NB: The Embassy has been known to insist on a ticket proving you plan to leave Indonesia.

Personal Information – Occupation:

If enrolled at University: "STUDENT" then your University address

If not enrolled at University: Tick OTHER and write NOT APPLICABLE for Name of Company and NOT APPLICABLE for any other information involving company details

Fill in other information as so, with passport info and upload a visa photo.

Students need to print two double-sided copies of their application form to send with their application. When applying, students should check embassy opening hours – the embassy is closed on both US and Indonesian national holidays. Visas take 3-5 working days to process if submitted in person and 5-7 working days when submitted via mail. The cost of the Social-Cultural Visa is \$50 for the Chicago, Houston, Los Angeles and San Francisco Consulates and Washington DC Embassy and \$55 for the New York Consulate. Payments can be made by company checks, cashier's checks and money order only. Students should address the money order to the "Indonesian Consulate General" or "Indonesian Embassy" for the respective office. For visa applications by mail, students should submit a prepaid self-addressed return envelope by U.S. Postal Service Express Mail/FedEx (No Ground FedEx) or UPS with tracking number. Please note that the embassy does not have expedited service and students should send the application and required documents listed above to the respective embassy address.

BNF has separate visa instructions for each Indonesian Embassy/Consulate within the US, as well as several other Indonesian Embassies/Consulates throughout the world, so BNF is happy to assist citizens of other countries with the application process via other Indonesian Embassies. Upon arrival at Immigration in Jakarta, students should walk past the Visa-On-Arrival desk, as they will already have the Social-Cultural Visa and go directly to the main foreigners' immigration desks.

## **ACCOMMODATIONS**

The field site is a semi-permanent camp which consists of several tent structures with tarpaulin roofs and cots for each student constructed from rice sacks. All structures are single-sex and students are required to bring their own sleeping bag, pillow and mosquito net. There is no electricity at camp apart from a few hours each evening via generator, and no air conditioning or fans are available at the camp. There is no internet signal at camp, but some phones may receive a weak phone signal inside the forest near camp or on the outskirts of the village. However, BNF always has a fully functioning SAT phone in case of emergencies. There is a common area with a set of tables for the students to work and eat at and a separate kitchen/eating space.

At camp all toilets are squat toilets, as is standard throughout Indonesia, and the camp is equipped with a sewage system. The bathroom in Indonesia is called a 'mandi'. 'To mandi' is to take a shower. These are cubicles with a water supply, in a large bucket, which you pour over yourself. There is no hot water, but water is instead pumped from the river to be used for the bathrooms and washing facilities. There is also a river that flows next to camp, which has separate designated areas for bathing and washing dishes/clothes if students choose to bathe there instead.

Meals are served at camp regularly at 7am, midday and at 6pm. Lunch boxes are available for teams who will be in the forest all day and snacks (e.g. peanuts, biscuits) are provided for students each day going into the forest. Meals are traditional Indonesian food, which includes rice with every meal. Drinking water and hot water for tea, coffee and hot chocolate is pumped from the river and is freely available at camp. BNF recommends students bring water purification tablets with them. BNF makes every effort to accommodate vegetarian, vegan and any other dietary preferences/food allergies at camp. This will be more difficult for the time spent in Palangka Raya, especially for vegans, so BNF recommends students consider bringing supplements/multi-vitamins along with them. There are no fridge/freezer facilities at camp, so fresh food is transported to camp by porters from the local village. Please note: a severe peanut, soy or egg allergy could be difficult to accommodate, as these foods are

used frequently in Indonesian cooking, but BNF has no problem with accommodating gluten or lactose intolerant diets.

## COURSE SCHEDULE

All IFR field school begins with safety orientation. This orientation includes proper behavior at the field site, proper clothing, local cultural sensitivities and sensibilities, potential fauna and flora hazards, review IFR harassment and discrimination policies and review of the student Code of Conduct.

The provisional field school schedule provided below is structured around BNF's goals during the field school. It is designed to include lecture and instruction sessions to present the theory and rationale to students, following which students gain forest experience. The schedule is also designed to be flexible and subject to potential alterations or delays due to weather or other unforeseen circumstances that are inherent when living in the jungle.

Day	Description
1	Arrive in Palangka Raya; check in at hotel; meet group and relax
2	Day: Check in at BNF office to collect passports and complete admin; introductory lecture; buy essential supplies and SIMs; visit university office for opening meeting. Evening: Dinner and Lecture on Introduction to Bornean Ecology & Biogeography
3	Morning: Lecture and discussion on Ecological & Habitat Monitoring Day: Travel to forest; camp induction and Health & Safety briefings
4 & 5	Introductory forest walks and orientation; training in GPS/compass/map use and basic ecological techniques; discussing field school plans with students.
6-16	Field activities and lectures, with exact activities for each day to be determined by evolving learning progress and needs throughout the field school. <b>Lectures</b> will generally be conducted during the cooler afternoons and evenings after forest activities and will cover topics including: Anthropology of Borneo's indigenous people; Phenology of Borneo's rainforests; Diversity & ecology of Borneo's fish; Diversity & ecology of Borneo's primates; Behavioral ecology of Bornean orangutans; Monitoring populations & ecosystems with bioacoustics; Multi-functional landscape biodiversity & conservation; and Biosocial conservation & research. <b>Field activities</b> will cover practical lessons about a variety of study techniques, including in relation to: ape populations, forest bioacoustics, camera trapping, vegetation and phenology plots, butterflies/moths/dragonflies and river fish. There will be a <b>day off</b> in the middle of the expedition, or whenever tired. <b>Practice study projects</b> will be introduced early on and undertaken in small groups during the expedition.
17	Prepare presentations and finalize notebooks
18	Morning: Practice study presentations to group, hand in field notebooks, complete individual reports for local university sponsor, pack and clean up camp Afternoon: Transfer to Mungku Baru village
19	Day: Community education session with Mungku Baru school children and BNF Education Division team.
20	Day: Transfer from Mungku Baru village to Palangka Raya; check in at hotel Evening: Farewell dinner and wrap up
21	Depart from Palangka Raya

## EQUIPMENT LIST

### General kit list

- Rucksack (65 Litres or more). No suitcases please
- Single bed mosquito net (a box net is best)
- Lightweight sleeping bag (1-2 season) or cotton sleeping bag liner. Students will be sleeping on rice sack cots for the duration of the programme, but it can get a little cold at night in the forest (min. 18°C), particularly once students have acclimatised, so it is advised to bring an extra blanket or thicker liner with you.

- Day pack (20-30 Litres) to carry daily supplies in the forest, which include food, water, first aid kit, equipment, poncho etc. A rain cover is also useful. Forest colours only please (greens and browns), no bright colours.
- Waterproof bags for any electrical equipment
- Head torch (LED recommended) plus batteries. AA and AAA batteries are available in Palangka Raya, but large square head torch batteries are not.
- Whistle
- Compass (Silva quality)
- Water-resistant digital watch
- 2 Liter water bottle.
- Camera
- Sun glasses
- Mosquito repellent
- Towel (microfiber towels dry quicker)
- Lightweight walking boots (Season 2) or walking shoes, which will provide sufficient support. Some people choose to wear wellington boots or trainers, which can be purchased in Palangka Raya (generally only European sizes 37-42 are available). BNF doesn't recommend purchasing expensive boots, as peat water is very acidic and tends to destroy most boots after continuous use. If students bring hiking boots, BNF advises wearing them prior to coming to camp to ensure they are comfortable.
- Waterproof jacket or poncho in forest colours (greens and browns)
- Sun hat
- Sweat bands, bandana or head bands
- Flip flops or sandals
- Min. two sets of casual clothes for relaxing in camp. T shirts and longer shorts are ok, but no short shorts please!
- Field clothes in forest colours only as bright colours disturb wildlife. BNF doesn't advise purchasing expensive field clothes for the course, as they become frayed or stained in the forest. Army surplus shops are a good source of cheap clothing. Natural materials, such as cotton, are cool and quick drying.

The following list of field clothing items is recommended as a minimum number of items to bring:

- Two pairs of forest trousers
- Two loose long sleeve tops/shirts
- Two t-shirts
- Two pairs of normal socks
- Two pairs of knee high/long socks/football socks

### **First aid kit**

Students will take a small first aid kit with the essentials into the forest and leave other supplies at camp, so a waterproof first aid bag is also useful. The starred items can be purchased in Palangka Raya.

- Painkillers (paracetamol/ibuprofen) \*
- Antihistamine creams and tablets for treatment of insect bites
- Fungicidal cream/antifungal dusting powder
- Plasters (band-aids) \*
- Thick bandages (1 long one) \*
- Eye drops \*

- Ear drops \*
- Alcohol wipes and antiseptic cream/spray \*
- Anti-malarial tablets
- Anti-diarrheal tablets \*
- Anti-nausea tablets
- Scissors and tweezers
- At least 12 sachets of re-hydration powders, such as Diarolyte (essential for replacing lost minerals from excessive perspiration)
- Talcum powder recommended for sweat rash \*
- Sun screen (a high SPF as we are 1<sup>o</sup> off the equator and the sun can be very strong), after sun lotion and lip protection cream. Only advised to bring a small bottle, as you won't be out in the sun often.
- Support bandage, if you have had any previous ankle or knee injuries.
- 'Epi Pen' if you have strong allergies to stings/bites/nuts. Please consult with your GP.
- Any personal medication that you normally bring e.g. Asthma inhaler. Also bring spares.
- For female volunteers; tampons and, if prone to cystitis, one course of preferred treatment

### **Other**

- ATM card/credit card
- Photocopies of any important documentation, including passport and visa.
- Two prong round plug converter (220v), which is the same as European plugs. Can be used both in town and at camp.
- Chargers for any electrical equipment
- Entertainment for when relaxing in camp (e.g. playing cards, books, games, MP3 player etc.)
- Decent waterproof binoculars, 10 x 42 magnification or more. Binoculars are recommended for the field as they are very useful and we do not have spares to lend to people.
- Indonesian phrasebook – students will be working on a daily basis with Indonesian field assistants, with varying degrees of conversational English.
- Small selection of stationary including notebook, pens and pencils \*
- USB pen – BNF can back up your photos for you during the expedition. USBs are also useful for storing any important documentation
- Silica gel
- Multi-vitamins

### **CURRENCY EXCHANGE**

Traveller's cheques cannot be changed in Palangka Raya and, while possible for notes of large denominations, it can be difficult to exchange cash. There are many Bureau de Change desks in the Jakarta airport, but they may be closed if students arrive late in the evening or early morning, and exchange rates are poor. By far the easiest way to obtain money is via the ATMs (cash machines) in Palangka Raya or at the airport in Jakarta upon arrival in Indonesia. There are many banks in Palangka Raya, which allow international ATM/debit card withdrawals, but BNF advises students to contact their bank before leaving the country to check about international transaction and withdrawal fees and place a note on their bank cards so the cards are not blocked by the bank for suspicious transactions while using the card in Indonesia.

### **CULTURAL AWARENESS**

Indonesia is a tolerant, but socially conservative, religious country, so BNF asks that students dress respectfully and will provide students with further social and cultural awareness information upon arrival in Palangka Raya. At all times in Jakarta, Palangka Raya and at the field site, women are requested

to wear a bra and to cover their cleavage, shoulders, upper arms, stomach and legs above the knee, and men are requested to wear long shorts or pants and shirts (no bare-chested). This is non-negotiable and BNF takes a stern view of people who ignore these rules. There are not many foreigners living in Palangka Raya, so people may approach students and ask to take a photograph together. People are generally friendly throughout Indonesia and this small gesture is very polite if students wish to oblige.

## REQUIRED READINGS

PDF files of all mandatory readings will be provided to enrolled students via a shared Dropbox folder.

Buckley, B. J. W., B. Ripoll Capilla, S. Maimunah, Adul, Armadyanto, N. Boyd, S. M. Cheyne, Iwan, S. J. Husson, Santiano, Salahudin, A. Ferisa, N. Namaskari, F. van Veen and M. E. Harrison (2018). *Biodiversity, Forest Structure & Conservation Importance of the Mungku Baru Education Forest, Rungan, Central Kalimantan, Indonesia*. Borneo Nature Foundation in collaboration with Universitas Muhammadiyah Palangkaraya and University of Exeter, Palangka Raya, Indonesia.

Cheyne, S. M., L. J. Gilhooly, M. C. Hamard, A. Höing, P. R. Houlihan, Kursani, B. Loken, A. Phillips, Y. Rayadin, B. Ripoll Capilla, D. Rowland, W. J. Sastramidjaja, S. Spehar, C. J. H. Thompson and M. Zrust (2016). Population mapping of gibbons in Kalimantan, Indonesia: Correlates of gibbon density and vegetation across the species' range. *Endangered Species Research* **30**: 133-143. doi: 10.3354/esr00734.

Condit R (1998) Tropical forest census plots: methods and results from Barro Colorado Island, Panama and a comparison with other plots. New York: Springer. pp. 46-54.

Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R. T., Molnár, Z. et al. (2018). Assessing nature's contributions to people. *Science*, 359(6373), 270-272.

Gaveau DL, Kshatriya M, Sheil D, Sloan S, Molidena E, et al (2013) Reconciling forest conservation and logging in Indonesian Borneo. *PLoS One* 8: e69887.

Husson, S.J., Wich, S.A., Marshall, A.J., Dennis, R.D., Ancrenaz, M., Brassey, R., Gumal, M., Hearn, A.J., Meijaard, E., Simorangkir, T. and Singleton, I. (2009). Orang-utan distribution, density, abundance and impacts of disturbance. In: Wich, et al. (eds.) *Orangutans: Geographic variation in behavioral ecology and conservation*. Oxford University Press, Oxford, UK.

Marques, T. A., Thomas, L., Martin, S. W., Mellinger, D. K., Ward, J. A., Moretti, D. J. et al. (2013). Estimating animal population density using passive acoustics. *Biological Reviews of the Cambridge Philosophical Society*, 88(2), 287-309.

Marshall AJ (2010) Effect of habitat quality on primate populations in Kalimantan: gibbons and leaf monkeys as case studies. In: Gursky S, Supriatna J (eds). *Indonesian primates*. Springer. pp. 157-177.

Rankin, L., & Axel, A. C. (2017). Biodiversity assessment in tropical biomes using ecoacoustics: linking soundscape to forest structure in a human-dominated tropical dry forest in southern Madagascar. In A. Farina & S. H. Gage (Eds.), *Ecoacoustics: the ecological role of sounds* (pp. 129-144). John Wiley & Sons.

Setchell, J. M., Fairet, E., Shutt, K., Waters, S., & Bell, S. (2017). Biosocial conservation: integrating biological and ethnographic methods to study human-primate interactions. *International Journal of Primatology*, 38(2), 401-426.

Vogel ER, NJ Dominy (2011) Measuring ecological variables for primate field studies. In: Campbell CJ, Fuentes A, MacKinnon KC, Panger M, Bearder SK (eds). *Primates in perspective*. Oxford University Press. pp. 367-377.

### RECOMMENDED READINGS

Beaudrot, L., Struebig, M., Meijaards, E., Van Balen, S., Husson, S.J., Young, C. and Marshall, A. 2013. Interspecific interactions between primates, birds, bats, and squirrels may affect community composition on Borneo. *American Journal of Primatology* 75 (2):170–185.

Bruner AG, Gullison RE, Rice RE, Da Fonseca GA (2001) Effectiveness of parks in protecting tropical biodiversity. *Science* 291: 125-128.

Cheyne, S.M. and Macdonald, D.W. 2011. Wild felid diversity and activity patterns in Sabangau peat-swamp forest, Indonesian Borneo. *Oryx* 45: 119-124.

Cheyne, S. M., Adul, F. J. F. van Veen, B. Ripoll Capilla, N. Boyd, Armadiyanto and S. Maimunah (2017). First record of the bay cat in mosaic heath/peat-swamp forest, Kalimantan, Indonesia. *Cat News* 65: 3.

Din, H., F. Metali and R. S. Sukri (2015). Tree diversity and community composition of the Tutong white sands, Brunei Darussalam: A rare tropical heath forest ecosystem. *International Journal of Ecology* 2015(807876). DOI: 10.1155/2015/807876.

Doan, T. M. (2003). Which methods are most effective for surveying rain forest herpetofauna? *Journal of Herpetology* 37(1): 72-81.

Farina, A., & Ceraulo, M. (2017). The acoustic chorus and its ecological significance. In A. Farina & S. H. Gage (Eds.), *Ecoacoustics: the ecological role of sounds* (p. 81). John Wiley & Sons.

Harrison ME, Page SE, Limin SH. 2009. The global impact of Indonesian forest fires. *Biologist* 56:156–163.

Harrison, M. E., Hendri, M. L. Dragiewicz, S. M. Cheyne, Krisno and S. J. Husson (2010). *Biodiversity of the Mungku Baru Ulin Forest, Central Kalimantan, Indonesia*. Report produced by the Orangutan Tropical Peatland Project for International Animal Rescue and local government, Palangka Raya, Indonesia, 86pp.

Harrison, M.E., Marchant, N.C. and Husson, S.J. 2012. Ecological Monitoring to Support Conservation in Kalimantan's Forests: Concepts and Design. The Orangutan Tropical Peatland Project Report, Palangka Raya, Indonesia.

Lee, B. P. Y.-H., Z. G. Davies and M. J. Struebig (2017). Smoke pollution disrupted biodiversity during the 2015 El Niño fires in Southeast Asia *Environmental Research Letters* 12(9): 094022 DOI: 10.1088/1748-9326/aa87ed.

Marchant, N.C., Purwanto A., Harsanto, F.A., Boyd, N.S., Harrison M.E. and Houlihan, P.R. 2015. 'Random-flight' dispersal in tropical fruit-feeding butterflies? High mobility, long lifespans and no home ranges. *Ecological Entomology* 40 (6): 696-706.

Mathai, J., Duckworth, J.W., Meijaard, E., Fredriksson, G., Hon, J., Sebastian, A., Ancrenaz, M., Hearn, A.J., Ross, J., Cheyne, S.M., Borneo Carnivore Consortium, and Wilting, A. 2016. Carnivore conservation planning on Borneo: identifying key carnivore landscapes, research priorities and conservation interventions. *Raffles Bull Zool Supplement*: 186–217.

Miyamoto, K., J. S. Rahajoe, T. Kohyama and E. Mirmanto (2007). Forest structure and primary productivity in a Bornean heath forest. *Biotropica* 39(1): 35-42. DOI: 10.1111/j.1744-7429.2006.00231.x.

- Morrogh-Bernard, H.C., Husson, S.J., Page, S.E. and Rieley, J.O. 2003. Population status of the Bornean orang-utan (*Pongo pygmaeus*) in the Sebangau peat swamp forest, Central Kalimantan, Indonesia. *Biological Conservation* 110: 141-152.
- Newbery, D. M. and J. Proctor (1984). Ecological studies in four contrasting lowland rain forests in Gunung Mulu National Park, Sarawak: IV. Associations between tree distribution and soil factors. *Journal of Ecology* **72**(2): 475-493.
- Page S, Hosićo A, Wösten H, Jauhiainen J, Silvius M, Rieley J, Ritzema H, Tansey K, Graham L, Vasander H, Limin S. 2009. Restoration ecology of lowland tropical peatlands in Southeast Asia: current knowledge and future research directions. *Ecosystems* 12: 888–985.
- Page, S. E., Rieley, J.O. and Banks, C.J. 2011. Global and regional importance of the tropical peatland carbon pool. *Global Change Biology* 17: 798–818.
- Posa, M.R.C., Wijedasa, L.S. and Corlett, R.T. 2011. Biodiversity and conservation of tropical peat swamp forests. *Bioscience* 61: 49-57.
- Proctor, J., J. M. Anderson, S. C. L. Fogden and H. W. Vallack (1983). Ecological studies in four contrasting lowland rain forests in Gunung Mulu National Park, Sarawak: II. Litterfall, litter standing crop and preliminary observations on herbivory. *Journal of Ecology* **71**(1): 261-283.