Acknowledgements

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We thank the following academic institutions, with which OuTrop are affiliated, for their ongoing support: the Wildlife Conservation Research Unit, (WildCRU), University of Oxford; the Department of Geography, University of Leicester; the Wildlife Research Group, University of Cambridge; Oxford Brookes University; and the College of Life and Environmental Sciences, University of Exeter. We are similarly grateful to the Trustees of the Orangutan Tropical Peatland Trust for their commitment and support: Susan Page, David Chivers, Claire McLardy, Victoria Smith and Ellie Monks.

Our work in 2012 was possible due to the generous financial support of the US Fish and Wildlife Great Ape Conservation Fund, The Orangutan Project, The Orangutan Appeal UK, Clouded Leopard Project/Point Defiance Zoo, Leakey Foundation; Association of Zoos and Aquaria Ape TAG, Robertson Foundation, Valley des Singes Conservatoire pour la Protection des Primates, International Primatological Society, Columbus Zoo and Aquarium, Primate Conservation Inc. and the Iris Darnton Foundation.

The support of numerous other organisations and individuals has also been an important component of our success during 2012: the communities and administrations of Kereng Bangkerai, Kecamatan Sabangau, Kotamadya Palangka Raya and Provinsi Kalimantan Tengah; the State Ministry for Research and Technology (RISTEK); the University of Palangka Raya; Dinas Kehutanan Kalimantan Tengah; Nicholas Cliffe & Co.; PT Rimba Makmur Utama and Mazars Starling Resources; International Animal Rescue; Daemeter Consulting; the Orangutan Health Project; Ivona Foitova; Laura Graham; Cheryl Knott; Michael Krützen; Erin Vogel; David MacDonald; Jack Rieley; Matt Struебig; Florian Siegert; LAHUKA; and all the Volunteers, Interns, Research Assistants and Students that joined us in Kalimantan.

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OuTrop Annual Report 2012 iv
Remarks from the Board

OuTrop has grown considerably in both size and scope since its inception in 1999. Our beginnings were humble, as an annual seasonal project involving only a handful of people conducting orangutan population density estimates in the Sabangau Forest. We have now expanded into a year-round project, employing and supporting numerous staff working on a wide variety of research and conservation projects, both in Sabangau and beyond.

Our original orangutan population assessment work remains a core part of the project, continuing to provide important data to Sabangau’s conservation managers. This is complemented by research on orangutan behaviour, allied population and behaviour research on two of the area’s other key primates – southern Bornean gibbons and red langurs –, various forest structure and biodiversity research projects, and research into techniques to restore degraded forest areas. The knowledge gained through each of these projects – which has included 22 research publications during 2012 – has propelled OuTrop into a leading position on biodiversity research and conservation issues in Kalimantan. This standing enables us to make important contributions to habitat and species conservation plans throughout the region.

One of the most pleasing aspects of our work has always been observing our staff, students and other personnel’s development while with us. This is a major aim of the project, and in 2012 we provided training and development opportunities to a total 14 local scientists/staff, 8 postgraduate students, 8 interns and 15 volunteers. This has both increased capacity and expertise within OuTrop and Indonesia, in addition to helping train the next generation of wildlife researchers and conservationists.

Finally, we continue to invest maximum effort into supporting on-the-ground habitat and species conservation efforts by our local counterparts, in particular through funding and advising the CIMTROP Community Patrol Team and Fire Attack Force in Sabangau. We are immensely proud of this team and its committed local leadership, which is vital for the continued effective conservation of the Sabangau Forest.

While 2012 has been a highly successful year from a research, capacity building and conservation perspective, we recognise that this contribution is far from adequate and continue to strive for greater impact in all of these areas. The sweat, blood and tears of our team in Indonesia and excellent support of our local partners, universities and funders has been – and will continue to be – critical to achieving this impact and our aim of conserving Kalimantan’s rich and unique biodiversity.

Mark E. Harrison, Susan M. Cheyne, Laura J. D'Arcy, Simon J. Husson and Helen C. Morrogh-Bernard

Komentar dari Direktur-Direktur

OuTrop telah berkembang dengan baik dalam ukuran dan ruang lingkup sejak didirikan pada tahun 1999. Kami memulai dengan awal yang sederhana, sebagai proyek musiman (tahunan) yang melibatkan hanya segelintir orang yang melakukan perkerjaan pengamatan populasi orangutan di Hutan Sabangau. Sekarang kami telah berkembang menjadi sebuah proyek sepanjang tahun yang memperoleh dukungan dan mendunia banyak staf yang bekerja pada berbagai bidang penelitian dan konservasi, baik itu di Sabangau dan seterusnya.


Salah satu aspek yang paling menyenangkan dari pekerjaan kami adalah saat melihat perkembangan staf dan mahasiswa kami selama mereka bekerja dengan OuTrop. Ini adalah salah satu tujuan utama dari proyek ini, dan pada tahun 2012 kami menyediakan kesempatan pelatihan dan pengembangan untuk total 14 ilmuwan/staf lokal, 8 mahasiswa pascasarjana, 8 magang dan 15 relawan. Ini meningkatkan kapasitas dan keahlian dari OuTrop dan Indonesia, dalam rangka melatih generasi berikutnya menjadi peneliti satwa liar dan konservasionis.

Akhirnya, kami terus melakukan upaya yang maksimal dalam mendukung habitat permukiman dan upaya konservasi spesies dengan mitra lokal kami, khususnya melalui pemberian dana dan nasihat kepada CIMTROP, Tim Patroli Sabangau dan Tim Serbu Api (TSA KALTENG) di Sabangau. Kami sangat bangga dengan tim ini dan kepemimpinan lokal yang berkomitmen tinggi, yang sangat penting untuk konservasi efektif yang berkelanjutan dari Hutan Sabangau.

Sementara tahun 2012 telah menjadi tahun yang sangat sukses dari penelitian, peningkatan kapasitas dan perspektif konservasi, kami menyadari bahwa kontribusi ini masih jauh dari memadai dan terus berusaha untuk dampak yang lebih besar dalam semua bidang. Keringat, darah, dan air mata dari tim kami di Indonesia dan dukungan yang sangat baik dari mitra lokal kami, universitas dan penyandang dana telah – dan akan terus – penting untuk mencapai dampak ini dan tujuan kami untuk melestarikan hutan Kalimantan yang kaya dan memiliki keanekaragaman hayati yang unik.

Mark E. Harrison, Susan M. Cheyne, Laura J. D'Arcy, Simon J. Husson and Helen C. Morrogh-Bernard
OuTrop: What, Where and Why

OuTrop was established in 1999. Then, as now, we aim to support biodiversity conservation in Kalimantan, Indonesia, through protection of important habitats for biodiversity and species’ conservation, and forest regeneration and restoration. We achieve this aim through:

1. Conservation-orientated research, providing important information for, and training to, conservation policy makers and practitioners;

2. Supporting locally-led on-the-ground conservation and sustainable livelihoods initiatives; and

3. Information dissemination at a local, national and international level, to highlight problems and solutions, and improve capacity, for biodiversity conservation.

This multi-faceted approach allows for the development of scientifically-informed and locally-integrated conservation strategies, ensuring the long-term strength and sustainability of the programme. Our priority site is the Natural Laboratory for the Study of Peat-swamp Forest (NLPSF) in the Sabangau Forest in Central Kalimantan, which is managed by our Indonesian sponsors and partners, CIMTROP at the Unviersity of Palangka Raya.

Sabangau is one of the most important areas of tropical rainforest in Borneo: it is home to the world’s largest remaining populations of Bornean orangutan and Bornean southern gibbon, is one of the largest terrestrial carbon stores and provides a multitude of important ecosystem services to the local community. OuTrop’s research, conservation support, information sharing and capacity building initiatives are key for the effective conservation of this area.

Further, our experience gained over the last 13 years places us in a strong position to help advance conservation efforts in other priority habitats in the region, through advising and supporting projects led by our many conservation partners.

Sabangau is one of the most important areas of tropical rainforest in Borneo. OuTrop’s research, conservation support, information sharing and capacity building initiatives are key for the effective conservation of this area.
Habitat Structure, Condition and Composition

Understanding the forest – its trees and other vegetation, and the impacts of human activities on these – is not only important in its own right, but is also essential for understanding the impacts of human activities on forest fauna. Vegetation studies are therefore a key component of OuTrop’s research.

New tree plots established in the highly-disturbed Kalampangan Forest and in relatively disturbed/edge forest in the NLPSF complement existing tree plots and are helping improve our knowledge of variations in tree species composition and forest structure in relation to human disturbance.

This understanding has been bolstered through studies on the ecological traits (e.g. leaf size, bark thickness, presence of stilt roots) and biomass (weight of trees/unit area) of dominant tree species. This will help us understand how the characteristics of trees and overall habitat condition varies over space and time, further advancing our understanding of the forest.

A major focus has been our first investigations of ground flora and lianas. These plants are fast growing and have high dispersal capacity, so are likely to respond more rapidly to human disturbance than slower-growing trees. This research has greatly improved our knowledge of Sabangau’s little-known ground flora and identified some groups that have potential to be used as indicators of forest quality, including lianas, sedges and pitcher plants.

Complementing these new research projects has been our ongoing studies of forest productivity – assessed through monitoring of litter-fall in traps positioned throughout the forest – plus reproductive phenology of tree species in our long-term tree plots. These data continue to provide insights into seasonal and inter-annual changes in the forest, and the causes of these.

Ecological Assessment and Monitoring: Approach

Ecological monitoring is vital for effective conservation management, as it helps steer projects towards implementing conservation activities in such a way as to successfully achieve long-term conservation goals.

OuTrop’s ecological monitoring programme is being developed to monitor trends in ecosystem condition and assess the effectiveness of conservation efforts being implemented to counter human disturbances in our core Sabangau research site. This will also enable us to establish frameworks, methods and baselines for ecological monitoring studies to support conservation management in other areas of forest in the region.

To understand trends in ecosystem condition (what), plus the causes of this (why), this programme involves intensive research into:

1. Indicators of forest condition, including forest area, structure and productivity;
2. Rapid-response ecological disturbance indicators, such as birds, butterflies and ants; and
3. Monitoring of our flagship conservation primate and felid species.

Monitoring research to assess ecosystem condition and the effectiveness of conservation efforts
Indicators of Ecological Disturbance

Our work in this area is focused on identifying rapid-response indicators of ecological disturbance that can be easily and cheaply monitored. Research focused on surveying selected species groups in areas of differing disturbance over the course of a full year. We are investigating the impacts of human disturbance and seasonal fluctuations on these groups, providing important advances in our understanding of the ecosystem. This will also help us to develop monitoring programmes for use in peat-swamp forests, thereby supporting conservation efforts in other areas.

Target Species: Primates

Orangutan behaviour

OurTrop’s flagship orangutan research programme includes both essential long-term monitoring of population size, distribution and condition, plus shorter-term targeted projects investigating specific aspects of orangutan behaviour and ecology. Orangutan population monitoring has continued at 40-day intervals in our main research camp, with repeat monitoring surveys conducted at two remote sites in the NLPSF. This will enable us to assess trends in Sabangau’s orangutan population; critical information for assessing the effectiveness of conservation efforts for orangutan conservation in the area.

Butterflies

Our intensive surveys of fruit-feeding butterflies from January-December 2012 provided 2,660 captures of 22 species over 2,400 trapping days. To support this work, we recently developed and published A Guide to the Butterflies of Sabangau, which provides an important reference material for use in other sites. Preliminary data analysis data reveals marked seasonal fluctuations in butterfly abundance, which may be linked to climate and food availability. We are currently investigating habitat associations for particular species, to understand the impacts of forest disturbance and edge effects on these.

Ants

One of the least-studied groups of peat-swamp forest fauna, our full year of ant data collection was completed in April 2012, yielding a total capture of 4,854 ants in 1,524 trapping days. Drawing from a range of taxonomic literature, we have identified 79 species of ant from 29 genera in Sabangau. We believe this to be the first ever inventory of ants in Bornean peat-swamp forest and hope to use this information to develop a guide to the ants of Sabangau – making the great difficulty in accurately identifying species worthwhile! Preliminary data analysis suggests that some ant species are generalists (present in most habitats), whereas others seem to have an affinity to specific habitat types. This gives a good platform for ongoing in-depth analysis of indicator species and temporal fluctuations in their abundance.

Birds

Building on previous research in the area, our full year’s intensive bird surveys concluded in June 2012, providing 8,401 bird records of 126 species. This is a very solid dataset for the investigation of habitat associations (indicator species), particularly because most species showed little seasonal variation. This is important, as strong natural temporal variations in species abundance seriously complicate interpretations of differences in survey results between sites of varying disturbance levels conducted at different times of year. Our ongoing data analysis is therefore focused on species that are likely to be good indicators of high-quality (primary) forest or of low-quality (secondary / disturbed) forest.

OurTrop’s flagship orangutan research programme includes both essential long-term monitoring of population size, distribution and condition, plus shorter-term targeted projects investigating specific aspects of orangutan behaviour and ecology. Orangutan population monitoring has continued at 40-day intervals in our main research camp, with repeat monitoring surveys conducted at two remote sites in the NLPSF. This will enable us to assess trends in Sabangau’s orangutan population; critical information for assessing the effectiveness of conservation efforts for orangutan conservation in the area.

In 2012, this has also been supplemented by new research projects, further increasing our scientific understanding of orangutans in peat-swamp forests. Main focuses in 2012 included intensive studies on:

- Male orangutan ranging behaviour, providing new information on male ranging requirements, dispersal and social structure;
- The function and physiological connections of the male long call;
- In-depth assessment of role of orangutans in dispersing forest tree species’ seeds;
- Strengthen strategies and using social network analysis to examine female social networks over the long term; and
- Introducing a new system for collecting long-term data on infant development, mother-infant interactions, and general social interactions.

For the orangutans it was also a successful year: Indy, Indah, and Cleopatra all gave birth to new infants! This indicates that the population is breeding well; a very positive sign. We have also enjoyed documenting the ongoing development of (above from left to right) Fio (3yrs), Isabella (6yrs), Georgia (8 yrs), and Tim (8yrs).

OuTrop’s orangutan expertise continues to be sought after by other organizations, with our team being contracted to help identify areas of suitable forest for release of rescued orangutans by International Animal Rescue in West Kalimantan. This is important for helping ensure the survival of these released animals and it is very satisfying to be able to make a meaningful contribution to this important effort.
Gibbon behaviour

The southern Bornean gibbon is considered endangered and Sabangau is one of its most important strongholds: based on the (incomplete) data currently available, Sabangau is home to 33% of the species’ global population.

OuTrop’s Gibbon Behaviour Project was established in 2005 to understand and help protect this important population, and continues to provide important insights into the species’ activity patterns, feeding, ranging and social behaviour. As in our other primate behaviour projects, it also provides opportunity for local staff and international intern capacity building, opening doors to future careers in primate research and conservation.

While our knowledge on gibbon population density and distribution in Sabangau is now good, the same cannot be said of most areas in Kalimantan. To help rectify this situation, in collaboration with Oxford Brookes University, we conducted intensive Müller’s gibbon population surveys in Sungai Wain Protection Forest, East Kalimantan (see map).

In pristine unburnt forest, population density was estimated at 3.18 groups/km². This is higher than the average 2.23 groups/km² in the lowland montane forests and the regenerating burnt forest appear, with a preliminary estimate of 0.98 groups/km². Tellingly, the pristine and burnt forest also differed in terms of canopy cover and tree height. We estimate this area holds a total 663 individuals, including 490 gibbons in the pristine area and 173 in the regenerating burnt area.

Alongside these surveys, full training was provided to four undergraduate students from University of Mularmawan and 12 local rangers from Sungai Wain Protection Forest team. These rangers are now responsible for long-term monitoring of the gibbon population and have obtained funding from Protection Forest Management Agency for this work.

This and OuTrop’s long-term gibbon population monitoring research fed into the production and publication of a Standard Operating Procedure. This will help guide future gibbon population density surveys by OuTrop and other organizations, further contributing to gibbon conservation research and planning throughout Kalimantan.

Consistent fruit availability facilitates the highest rates of fruit and seed eating in any colobine.

Red langur behaviour

Our third year of red langur behaviour research brought our overall data-set to over 1,750 hours of follow data, during which we have documented well over 100 food items. Crucially, we have discovered that consistent fruit availability facilitates the highest rates of fruit and seed eating in any colobine, meaning that Sabangau’s population does not appear to rely on lower-quality ‘fall-back’ foods (e.g., leaves), unlike many other populations. Fruit availability also appears to limit red langur population density among Sabangau’s varied habitats and leads to the largest day ranges found in colobine monkeys, as they search the forest in pursuit of these fruits.

A male tenure change in one of our study groups also provided insight into adult male replacement and new group formation in red langurs. The resident male was wounded defending his females and offspring, forcing him to yield his territory and mates to a rival male. The juvenile males departed with the deposed adult, but we were unable to track them to learn their fate. The new male now controls the old territory, appearing to be led to feeding and sleeping sites by the remaining females!

To better understand and protect the species, we have been looking beyond Sabangau, in the highly-degraded Kalampangan Zone in the ex-Mega Rice Project area. Although extreme weather – drought and fires, followed by heavy rains – hampered surveys, red langur presence was confirmed. This finding is important, in light of the increasing degradation of peat swamps throughout Borneo. Together with Oxford Brookes University, we also surveyed red langurs in Sungai Wain Protection Forest, East Kalimantan, where we confirmed the presence of an important population in the remnant lowland dipterocarp forests.

To facilitate future surveys by OuTrop and others, a Standard Operating Procedure for red langur population surveys was produced, which is freely available on our website, together with all our other SOPs and reports.

In a new collaboration with the University of Munich, we are assessing red langur ranging in relation to habitat condition, as identified by remote-sensing LiDAR (Light Detection and Ranging) methods. This will elucidate important habitat characteristics to better inform conservation planning.
**Target Species: Felids**

Our Sabangau Felid Project is the first long-term intensive camera trap study of the elusive clouded leopard and the only felid project in Kalimantan’s peat-swamp forests. We aim to facilitate conservation of Borneo’s endangered wild cats by merging pioneering ecological research, host country capacity building and environmental education. These efforts have resulted in a large number of cat images obtained, picturing many different individuals.

**Analysis of camera trap data on clouded leopards reveals:**

- A population density estimate of 1.85 individuals per 100 km² across the three major habitat sub-types in Sabangau;
- Insights into population composition: of the six individuals captured on photographs in our 150 km² survey area, five are males and only one is female;
- An average daily path length of 10 km for males and 1.5 km for the only female; and
- That canopy cover and undergrowth are significant predictors of clouded leopard capture on specific cameras, not presence of prey species on the same or surrounding cameras.

Of the six individuals captured on photographs in our 150 km² survey area since May 2008, five are males and only one is female. The presence of 1 female only captured in October 2009 is a perplexing and interesting issue. For successful breeding, males and females must have overlapping home ranges. We have seen that the males are clearly tolerating each other and have overlapping home ranges but only 1 male has been shown to overlap with our female. Females are smaller than males and have sole responsibility of raising cubs therefore our hypotheses as to the lack of photo captures of females are 1) We strongly suspect the females are staying well away from any human disturbance in Sabangau which is why we only have 2 captures as all cameras are on trails and within the research area, 2) females are perhaps staying away from high concentrations of males which we do have in the grid (5 males) as males may pose a threat to newborn cubs, 3) females are staying away from high concentrations of males as they cannot compete for prey as well with so many larger males present and 4) the selectively logged nature of the research grid renders it unsuitable for denning cubs so the females do not come there.

**Outside Sabangau: The Kalimantan Cat Project**

This collaborative project with WildCRU, University of Oxford is attempting to redress the lack of data on felid distribution across Kalimantan. We will survey eight sites over two years, covering different habitat types, management regimes and sizes to gain a more complete picture of the distribution, densities and conservation threats to the five Bornean cat species. This is the first time a project of this scale has been attempted and a large group of collaborators will be involved to maximise conservation potential and data for these felids.

**The Sungai Wain Protection Forest is the only intact lowland forest surviving in south-eastern East Kalimantan**

During our surveys, we have provided full training to four undergraduate students from the University of Mulawaran, 12 local rangers from Sungai Wain Protection Forest team, 6 local people from Bawan Village and 8 rangers from Kutai National Park (see map - page 7).

Large numbers of pig-tailed macaques, muntjac deer and bearded pigs were photographed, so it follows that these potential prey species were accompanied by images of two clouded leopards (one male and one female), one male bay cat and one male flat-headed cat. Many other species, including Argus pheasants and pangolins were also captured!
OuTrop’s 2010 surveys revealed a diverse fauna in Bawan Forest, including 15 mammal and 131 bird species, so this site was an obvious choice for in-depth field surveys. The site contains a mosaic of high-quality heath, low-canopy peat-swamp and burnt forest. Our camera trap surveys captured one leopard and one marbled cat. No other cat species were detected during the survey period, which may be a consequence of relatively low prey abundance, and the fragmented nature of the forest.

The Bawan Forest contains a mosaic of high-quality heath, low-canopy peat-swamp and burnt forest

Research Collaborations

Understanding the role of ecology in orangutan reproduction with Cheryl Knott, Boston University, MA, USA

Impact of peat chemical composition on the nutritional content of orangutan foods with Erin R. Vogel, Rutgers University, USA

Orangutan phylogenetics, relatedness and dispersal with Michael Krützen, Zurich University, Switzerland

Using LiDAR to understand primate ranging and habitat quality in Sabangau with Florian Siegert and colleagues, University of Munich, Germany

Barito River Initiative for Nature Conservation and Communities (BRINCC) Expedition Advising and collaboration on the research expedition, which was directed by OuTrop scientists

Flora and Fauna International - Indonesia Collaboration on felid population surveys in Kalimantan

Hutan Lindung Sungai Wain Collaboration on felid population surveys in Kalimantan

International Animal Rescue Collaboration on orangutan release site surveys in West Kalimantan and felid population surveys in Kalimantan

Kalaweit Gibbon Rehabilitation Project Advising on gibbon reintroduction and releases

Kutai National Park Collaboration on felid population surveys in Kalimantan

Leipzig Institute for Zoo and Wildlife Research Advising and collaborating on Bornean carnivore conservation

Oxford Brookes University, UK Advising and collaborating on various student projects

Zoological Society of London Indonesia and China Programmes Advising and collaborating on various projects, including ecological and gibbon monitoring

In 2012 we collaborated with thirteen research groups worldwide
Publications 2012


Submitted


SECTION B: RESEARCH AND CONSERVATION CAPACITY BUILDING

Staff Development Programme

Educating local Indonesian scientists and community members is essential for ensuring that local capacity exists to effectively conserve forests, and that local communities understand and support conservation efforts. We provide regular training to our local project staff in research skills, computer use, electronic data storage, peat-swamp forest scientific and conservation issues, and English language.

Our monthly research team meetings are particularly important for keeping our local staff engaged and informed about our research. These meetings are used as an opportunity for staff to give presentations to the team on the results of our research, and to conduct informal training. On-the-job training is also provided on all aspects of our research, including use of computers for data storage and report writing. Daily communications between our Indonesian and foreign project personnel also provides good opportunities for local staff to learn the English language, opening up new doors to them both on the project and in the international research and conservation community.

This training provides a framework for our local staff to develop their role within OuTrop and take on more responsibility over time. Our longer-term staff are given specific projects to coordinate, and our junior staff are encouraged to develop new skills and prepare for more senior roles in future.

All day-to-day management of the following projects are coordinated by local staff (under the supervision of OuTrop management and scientists):

- Orangutan nest surveys and phenology: Santiano, Forestry Coordinator
- Nursery and reforestation: Salahudin, Nursery Coordinator
- Butterfly field surveys: Ari Purwanto and Fransiskus Agus Harsanto, Senior Researchers
- Camera trap and litter-fall surveys: Adul, Camera Trap Coordinator
- Orangutan long-call Project: Abdul Azis, Project Assistant
- Red langur field research: Supiansyah, Red Langur Coordinator

The coordination of these projects involves fieldwork, data entry and the writing of monthly internal progress reports, with all Coordinators receiving one-on-one training in necessary techniques.

Student Projects

The Ranging Behaviour of Male Orangutans in Sabangau Peat-swamp Forest
Ben Buckley, University of Cambridge, UK, PhD – dissertation write-up ongoing.

Ranging and dispersal are integral to a species’ social and mating systems, and fundamental for understanding the costs, benefits and evolution of these systems. Our knowledge of these behaviours in male orangutans is poor, owing to their very large home ranges and the challenges of tracking them in their habitat. The aim in this study is to address this knowledge gap through a multi-lateral approach, combining full-day behavioural observations on habituated male orangutans with collection of genetic samples from the orangutan population found within 10,000 ha of continuous peat-swamp forest in the NLPSF.

This will answer a number of questions on male dispersal and ranging, by identifying individual core and home range sizes, discerning range use and dispersal patterns, and furthering knowledge on site fidelity and relatedness. Such information is crucial for understanding the mechanics of the orangutan mating system. Field data collection has now been completed and the genetic samples are waiting to be analysed. Tentative results indicate that male Bornean orangutan home ranges are much larger and overlap considerably more than previously reported. Final results of this study will improve understanding of the complicated orangutan social system, help construct models for the social and mating behaviour of extant apes, and have important implications for forest protection programmes aiming to protect threatened orangutan populations.

The Conservation and Ecology of the Red Langur (Presbytis rubicunda) in Sabangau Peat-swamp Forest, Central Kalimantan, Indonesia
David A. Ehlers Smith, Oxford Brookes University, UK, PhD – dissertation write-up ongoing.

The aim in this project is to establish the first-ever conservation monitoring parameters for the Borneo endemic red langur (Presbytis rubicunda) in the ombrogenous peat-swamp forest of Sabangau, the largest contiguous lowland forest remaining on Borneo. Data on feeding and behavioural ecology, home-range and habitat use, density and population demographics, and resource use, niche separation and competition avoidance have been gathered by way of full-day follows and surveys along transects in the NLPSF’s three main forest sub-types. Density estimates in two of the three forest subclasses have been established, and over one year of behavioural and feeding data collected. These data are now being collated and analysed, with the purpose of updating the IUCN Red List status of red langurs, to highlight the need for conservation of this primate species in the face of the sustained pressure from habitat loss.

Can the Male Orangutan’s Long Call be an Indicator of Forest Quality?
Amanda Hoepfner, University of Utah, USA, PhD – fieldwork ongoing

Spontaneous long or loud primate calls are assumed to be honest signals that inform conspecifics about the sender’s “quality” (i.e., good genes, body size or current condition). Orangutans are semi-solitary animals, and adult flanged males communicate with each other over long distances through their “long calls”. If the long call is an honest signal that reflects males’ current body condition, it could give insight into the forest quality, be used for mate choice
decisions and intra-sexual competition. Understanding a long call signal contents is important for elucidating its role in mate finding and choice behaviour, plus orangutan social structure. Investigation of long calls also therefore has previously unexplored potential to assist conservation efforts by connecting critical aspects of behavior with habitat quality, a key determinate of population density. To examine these questions, wild orangutan long calls will be recorded, and the relationship between calling behaviour and body condition compared among high-fruit and low-fruit seasons over multiple years. I hypothesize that the long call is a honest signal that indicates body condition through modifications in call rate, duration and acoustic structure. If this is correct, orangutan long calls can provide important insights into male condition and, hence, potential habitat quality, improving our ability to monitor the health of wild orangutan populations.

Gardeners of the Forest: Quantifying the Role of Forest Fauna in Seed Dispersal using Orangutans as a Case Study
Esther Tarszisz, University of Wollongong, Australia, PhD – fieldwork ongoing

Orangutans are likely to play an important role in forest maintenance, but we presently know very little about their role as seed dispersers. This is particularly true in the Sabangau peat-swamp forest; the largest contiguous lowland forest remaining in Borneo. In this project, behavioural, feeding and movement ecology data will be collected and analysed alongside data on seed germination from spat-out and defecated seeds to determine the orangutan’s seed-dispersal ability. Seed predation by orangutans (chewing and destroying seeds) will also be revealed. This will illuminate the orangutan’s role in maintaining natural forest processes, and in natural and human-facilitated forest recovery following human disturbance. It will also assist in developing a better understanding of the potential impacts of orangutan population declines and extinctions on forest ecology.

Feedbacks Between Fire, Vegetation, and Landscape Configuration: Changing Disturbance Dynamics in the Peat Swamp Landscape
Megan Cattau, Columbia University, PhD – ongoing

Fire causes dramatic changes to landscapes where it is a novel disturbance, such as tropical peat-swamp forests, and compromises the provision of peatland ecosystem services (e.g., carbon sequestration). In this project, the cause of fire events and the consequences for the forest community are evaluated in the former Mega Rice Project (MRP) area in Central Kalimantan, Indonesia. The MRP is a failed agricultural project consisting of patchy forest remnants surrounded by degraded fire-prone peat swamp. This work builds on Cattau’s previous research with OuTrop, in which the effects of landscape change on the vegetation community in the MRP were evaluated. First, a model of fire probability is developed to disentangle the relative effects of human access, vegetation, fire history, and climate on fire risk. Second, because in the absence of forest reestablishment, degraded peat lands will continue to become aerated, resulting in increased susceptibility to ignition and CO2 emission, the factors that alter the trajectory of vegetative regrowth in the post-burn barren area are evaluated. Third, because fire alters the landscape configuration of forest fragments, the role of landscape configuration in structuring tree composition within forest fragments and the differential responses of tree species with different traits to fragmentation are assessed. This project contributes to our understanding of the relative contributions of biophysical and anthropogenic factors to fire occurrence and adds to the body of scientific knowledge concerning the dynamics between vegetation and fire in the peat swamp forest.

Assessment of the impacts of Habitat Disturbance on Non-tree Flora
Natalia Chetina, Oxford University, UK, BSc

This project represented OuTrop’s first dedicated effort to understand the impacts of human disturbance on the non-tree flora of peat-swamp forests. This is an important new component of our ecological monitoring programme, complementing our data on tree species composition and structure of trees collected from many plots over more than 10 years. Non-tree forest flora were sampled using nested vegetation plots in disturbed and undisturbed parts of the NLPSF and Kalampangan research sites. This included lianas, pitcher plants, forest-floor shrubs, epiphytes, orchids and other non-tree forest flora, which were identified and counted within each plot. Analysis reveals clear responses to disturbance, particularly among lianas and pitcher plants, providing new insights into the impacts of human activities on the ecosystem.

Assessing the use of Physiological Traits of Trees for Ecological Monitoring in the Sabangau Forest
Elizabeth Campbell, Dalhousie University, Nova Scotia, Canada, BSc

This project represented our first study of the ecological traits of peat-swamp forest trees. Traits measured include leaf size, presence of aerial roots and sap, and bark thickness. Using data on dominant tree species from our long-term tree plots, we are investigating whether certain traits (or tree characteristics) are more dominant in one plot than another. A further important trait analysed in this project is above-ground biomass, estimated through allometric equations. In addition to providing information on characteristics of individual trees, when combined for all trees within a plot, these data provide an important indication of overall forest condition and carbon storage in an area. OuTrop’s development of this method therefore represents an important addition to our monitoring programme.

Investigating the Influence of Edge Effects on Butterflies in the Sabangau Forest
Robert Durgut, University of Plymouth, UK, BSc

Forest edges often have different flora and fauna communities than interior forest, due to differences in environmental conditions (e.g. wind exposure) or inward migration from adjacent habitats. This is an important consideration for the conservation of forest in Borneo because, as forests become smaller and more fragmented, the proportion of edge habitat will increase. Here, we investigated the influence of edge-effect on the fruit-feeding butterflies of Sabangau to complement our year-long butterfly research project. Sampling transects were established at increasing distances from the forest edge, and all butterflies captured were identified, measured, marked and released. Analyses indicate a decrease in butterfly species diversity and, surprisingly, an increase in bait loss (i.e. robbery by other species!) closer to the forest edge. This has important implications for future designing of butterfly ecological monitoring studies.

Investigating the Influence of Edge Effects on Vegetation in the Sabangau Forest
Erik Frank, University of Wurzburg, Germany, BSc

As a further development of our research on forest edges, in this project we aimed to assess the influence of edge-effect on peat-swamp forest vegetation. A grid of 10 x 10 m survey plots was developed covering locations at varying distances from disturbance at the forest edge, and all trees and ground vegetation within these plots was surveyed. Data revealed strong differences in vegetation near the edge among trees,
lianias, pitcher plants and pandans. This difference is most pronounced within 100 m of the forest edge, which has important implications for our understanding of the ecosystem and design of future flora monitoring studies.

**Population density and habitat assessment of Müllers gibbon (Hylobates mulleri) in the Sungai Wain protection forest, Indonesia**

Lauren Gilhooly, Oxford Brookes University, UK, MSc

Muller’s gibbons (Hylobates muelleri) are the most widely distributed gibbon species on the island of Borneo, though they remain under represented in the scientific literature. Previous studies on primate species have found correlations between population density and key vegetation characteristics, but no such study has been carried out on Muller’s gibbons. The present study sought to assess group density and habitat of a population of Muller’s gibbons residing in lowland dipterocarp forest the Sungai Wain Protection Forest, East Kalimantan, from which no published data on gibbon feeding ecology are available. The preferred food items from two long-term studies on other Bornean gibbon species are compared to a summary of the tree species within Sungai Wain Protection Forest to make predictions about the potential important food sources for the present study species. Group density was estimated using the fixed-point count survey method, while habitat characteristics were measured using speed plots located at each survey site. Group density within the pristine forest was estimated at 3.18 ± 0.57 groups/km² for a total of 11.13 ± 5.27 individuals/km². A confident estimate of the group density from the burnt area was not possible due to a lack of sufficient data. No correlations were found between group density and any of the measured habitat characteristics.

**Population survey of red langurs in Sungai Wain, East Kalimantan**

Elena Bersacola, Oxford Brookes University, UK, MSc thesis

In this project, we aimed to assess the population density and habitat of red langurs (Presbytis rubicunda) in one of the last remaining lowland pristine forests in southern East Kalimantan. We employed Distance sampling on line transects and assessed the habitat using 100 m² plots. We calculated density at 5.35 groups/km², with group sizes ranging from 2 to 8 individuals. Red langurs in Sungai Wain are found at the highest recorded densities, suggesting the occurrence of some level of compression within a small pristine habitat. As a result of this work we developed a Standard Operating Procedure for surveys of red langurs, with the aim of facilitating long-term monitoring of this species across Borneo.

**Assessing the Population of Proboscis Monkeys and Threats to Their Survival in Balikpapan Bay, East Kalimantan, Indonesia: A Preliminary Study**

Katherine Scott, Oxford Brookes University, UK, MSc

Balikpapan Bay in East Kalimantan is home to one of the largest remaining populations of the Endangered proboscis monkey (Nasalis larvatus). To date nothing has been published on the proboscis monkeys inhabiting this area, beyond preliminary surveys in 2007 that estimated the local population to be around 400 individuals. Their preferred coastal habitats are also the epicentre for human expansion and other anthropogenic activities. The intention in this study is to highlight potential anthropogenic pressures facing the proboscis monkey population in Balikpapan based on data collected and to make recommendations as to appropriate conservation measures. This preliminary study will improve conservationists’ understanding of the current health and long-term viability of this population, and data collected will form a baseline to direct future research. The proboscis monkeys in the bay are predicted to go extinct within the next 15 years and therefore it is of paramount importance that more studies are conducted in this area, to understand their population dynamics and safeguard this species against future extinction.

**Density of red langurs in the primary forest of Sungai Wain equates to 19.03 individuals/km².**

Volunteering with OuTrop provides experience of all stages of our scientific research projects.
Our Indonesian partners, CIMTROP, manage the Natural Laboratory, working to conserve and protect this valuable forest. Conservation strategies employed primarily include fighting forest fires, damming man-made forest canals to prevent fire, conducting forest patrols to prevent illegal logging and other destructive activities, aiding reforestation using the Sabangau seedling nursery, improving local relations and developing sustainable livelihood options. These activities are essential for protecting the forest and the globally-important orangutan population it contains. CIMTROP’s community-based approach is facilitating mitigation of these problems to begin.

In 2002, the local people benefited by recognising the logging damage and threats to their forest, in 2002 the local people established a Community Patrol Team made up of young, committed members from the local village of Kereng Bangkerai. The team wanted to stop the continued exploitation of their forest heritage. Supported by village leaders and a community wanting to protect their forest heritage, they declared the Natural Laboratory out-of-bounds to logging and other destructive activities. From 1997 to 2005, illegal loggers maintained thousands of canals, using them to float wood out of the forest. Drainage from these canals increases risk of peat degradation and, more immediately, forest fires. In the last 8 years, there have been several severe fire events. In 2004, the Community Patrol Team succeeded in ending this forest destruction. This major achievement is a prime example of how a locally-led approach can make critical contributions towards orangutan conservation.

This year the Sabangau Community Patrol Team and Fire Attack Force has a newly-appointed leader, Yanto. He has worked for this CIMTROP conservation team for 8 years and is one of its most dedicated staff members. With the assistance of OuTrop and our kind funders, this team’s contribution to orangutan conservation in Sabangau continues to grow.

The forest continues to be protected for biodiversity conservation and the benefit of the local community, including as a fish breeding ground and for collection of sustainable products. The team meets with illegal loggers and other forest users, explaining the situation and working together with police where necessary. Team members work tirelessly to ensure the forest is protected and can regenerate following past disturbances. Yanto and his team have worked over the past year to help change and improve the Patrol Team to become more effective. The team have concentrated on protecting the forest from fire and maintaining good relationships with the local community so that they understand and support the conservation in the area.
In August 2012, the team’s work included forest patrols and monitoring of dams they built previously to help prevent forest fires. These dams are left after use by past illegal logging disturbance and continue to dry the peat, making it very vulnerable to fire. Any reduction detected in water flow was taken on 31/01/2012). OuTrop’s Reforestation Project aims to develop techniques for the restoration of deforested peatland in Sabangau and elsewhere in Kalimantan. The largest deforested area in Sabangau covers much of the river floodplain, extending up to 2km from the main river channel for a length of ~150 km between Palangka Raya and Borneo’s southern coast. Villagers from the neighbouring Kereng Bangkirai recall that dense jungle lined the river banks as recently as the 1970s, before massive fires decimated the area.

We aim to identify plant fast-growing tree species that will colonise deforested areas, create shade for secondary colonisers, and encourage fauna to spread seeds into the area. This should ‘kick-start’ natural regeneration, helping to restore the forest over the long term. It may also allow riverine species such as the proboscis monkey (IUCN endangered) to recolonize the area.

Only a handful of species are hardy enough to survive in the harsh conditions of the flood plain, and seven species were carefully selected from these by our local Nursery Coordinator and botanists. Seedlings are then tended and grown for up to two years before planting. Suitable planting sites were selected in the deforested area, at varying distances from the forest edge, and covering a range of (characterised) environmental conditions.

In 2012, over 1,300 seedlings were planted in the deforested area, under the supervision of our local Nursery Coordinator. We have developed an intensive monitoring programme to assess the development of these seedlings in the coming years. Monthly checks will take place throughout the year, including underwater surveys during the wet season. Growth rates will be measured, and the causes of any seedling mortality will be recorded - whether flooding, scouring, or being broken by passing pigs (our biggest problem so far!). This will allow us to greatly improve our understanding of the reforestation potential of each species and optimum restoration strategies for the area.

A meeting was also held at camp to socialise the team’s activities with OuTrop’s team, including our local and foreign staff, and volunteers. This provided an excellent opportunity to educate all our new arrivals, in particular our local village staff, regarding the importance of the Patrol Team’s activities for protecting the forest. In turn, this helps increase support for conservation within the local community, through educating our local village staff and transfer of information from them to other village community members.

Reforestation Project

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To further increase our project impact and improve relations with important partners and funders, progress and development of OuTrop’s online accounts and outreach has been a main focus within 2012.

Our website has been completely updated in terms of overall appearance, giving more complete information on the project in a more attractively-presented format and easily navigable links. New ‘Science’, ‘Affiliation’, ‘Working for us from home’ and ‘Trust Patron’ pages have been added and trust information moved and edited. The website is now more accessible.

The OuTrop Facebook and Twitter profiles are now being maintained with more engaging and frequent updates, often more than once each day. This has led to 630 OuTrop Facebook “likes” and 529 Twitter followers. Our Twitter followers have been increasing by 20-30 each month, as a result of frequent activity, good photos and replies to specific individuals and organisations.

A total 111 OuTrop blog posts were posted in 2012. The new schedule of themed posts – “Hello Monday” introducing project members, “What’s Happening Wednesday” with interesting goings-on and “Species Saturday” introducing forest flora and fauna – allows followers to anticipate posts and regularly check, increasing its impact. These posts are written by all of OuTrop’s team members, including our local staff, students and interns.

OuTrop’s newsletters have evolved into much more visual, formatted documents. The average length of these newsletters has also increased, reflecting the project’s increased research and conservation outputs. This refreshed style and formatting quality makes a more professional, twenty first century impression of OuTrop. ‘Funders Updates’ are now being sent to all key funders on most non-newsletter months. With topics covering an update on the Community Patrol Team, the Reforestation Project and births of new primates, these updates have helped secure further funding donations.

OuTrop has also been able to increase the potential for members of public come and visit camp so they can promote our work. Reaching demographics that are not part of our regular communications is vital if OuTrop is to have a global presence. The communication goals and key fundraising strategies for OuTrop are being developed and will hopefully be tested in 2013.
SECTION E: ORGANISATIONAL STRUCTURE

Directors

Dr Mark Harrison  Managing Director
Simon Husson  Founding Director; Director of Conservation
Dr Helen Morrogh-Bernard  Founding Director; Director of Orangutan Research
Dr Susan Cheyne  Director of Gibbon and Felid Research
Laura D’Arcy  Director of Forestry Research

Research Team

Bernat Ripoll  Project Manager and Research Team Leader
Nick Marchant  Senior Scientist and Project Manager
Luke Ward  Primate Scientist
Ari Purwanto  Senior Researcher
Franciscus Harsanto  Senior Researcher
Marc Dragiewicz  Advisor – birds and biodiversity
Peter Houlihan  Advisor – butterflies
Aimee Oxley  Research Assistant
Nick Boyd  Research Assistant
Eric Perlett  Research Assistant
Santiano  Coordinator, Forestry Research, Orangutan Surveys, Nursery
Twentinolosa  Senior Researcher and CIMTROP Camp Manager
Salahudin  Coordinator, Nursery and Reforestation Research
Adul  Coordinator, Camera Trap Research
Supiansyah  Coordinator, Red Langur Research
Abdul Aziz  Project Assistant, Orangutan Long-call Project
Aziz K  Research Staff
Rahman  Research Staff
Siswanto  Research Staff
Bustani Arifin Unyil  Research Staff

Felid Team

Wiwit Juwita Sastramidjaja  Project Manager
Muhalir  Assistant Manager

Operations Team

Listiano  Kitchen Coordinator
Ibu Yanti  Senior Cook
Ibu Jarlah  Cook
Ibu Dameh  Cook

Communications and Fund-raising Team

Thea Powell  Communications Manager
Joana Aragay  Assistant Research Team Leader & Communications
Jessica Walters  Fundraising Assistant

Postgraduate Research Students

Ben Buckley  PhD student
Dave Ehlers Smith  PhD student
Megan Cattau  PhD student
Amanda Hoepfner  PhD student
Esther Tarszisz  PhD student
Lauren Gilhooly  MSc student
Elena Bersacola  MSc student
Katherine Scott  MSc student

Research Interns

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Stijn Schreven  Biodiversity Intern
Jeremy Taylor  Gibbon Intern
Camille Hill  Red Langur Intern
Jess Stitt  Orangutan Intern
Helen Thompson  Red Langur Intern
Sarah Batty  Gibbon Intern
Barbara McAllister  Orangutan Intern

Volunteers

Beth Barrow
Rob Durgut
Rob O’Hagan
William Summers
Liz Campbell
Natasha Chetina
Kah Ming Teo
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Erik Frank
Paul Fadden
Morena Varga
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Hanna Hansen
The Orangutan Tropical Peatland Project is registered in the UK as a non-profit organisation (Company No. 06761511) and is supported by the Orangutan Tropical Peatland Trust (UK Registered Charity No. 1142870).

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