

# First Steps Towards the Conservation of Wild Cats in Sabah.

Report of the Inaugural International Workshop on  
the Bornean Wild Cats

*4<sup>th</sup>-5<sup>th</sup> November, Penampang, Sabah, Malaysia*



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# Workshop Agenda

4<sup>th</sup> November

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**8:50 Arrival of YB Datuk Ellron Alfred Angin, Assistant Minister of Tourism, Culture and Environment.**

**09:00 Welcoming remarks**

*Augustine Tuuga, Deputy Director, Sabah Wildlife Department*

**09:10 Opening Speech**

YB Datuk Ellron Alfred Angin, Assistant Minister of Tourism, Culture and Environment.

09:30 *Break for refreshments*

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***First session: Current knowledge of wild cat ecology and conservation needs in Sabah***

*Chair: Professor Dr. David Macdonald, Director of the Wildlife Conservation Research Unit, University of Oxford, UK*

**10:00 The Bornean Wild Cats and Clouded Leopard Project: An introduction**

*Joanna Ross, Principal Investigator, Bornean Wild Cat and Clouded Leopard Project, Global Canopy Programme*

**10:30 The Bornean Wild Cats & Clouded Leopard Project: Initial findings from three years of field work**

*Andrew Hearn, Principal Investigator, Bornean Wild Cat and Clouded Leopard Project, Global Canopy Programme*

**11:00 Genetics, modelling and field research; a cocktail aiming to assist the protection of carnivores in Sabah**

*Andreas Wilting, ConCaSa, Leibniz Institute for Zoo and Wildlife Research*

**11:30 Can commercial forest reserves contribute to the conservation of Bornean felids?**

*Azlan Mohamed, University Malaysia Sabah/ ConCaSa/ WWF Malaysia*

**12:00 Panel / Q & A session**

12:30 *Break for lunch*

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***Second session: Forest management for wild cat conservation in Sabah***

**14:30 The role of Sabah Forestry Department in the conservation of Sabah's wild cats**

*Mr. Peter Lagan, Sabah Forestry Department*

**15:00 The role of the Sabah Wildlife Department in the conservation and management of Sabah's wild cats**

*Mr. Augustine Tuuga, Sabah Wildlife Department*

**15:30 The role of Sabah Parks in the conservation of Sabah's wild cats**

*Dr. Maklarin Lakim, Sabah Parks*

**16:00 Panel / Q & A session**

16:30 *Break for refreshments*

**17:00 Closing comments**

*Chair*

**17:30 Day end**

**19:00 Welcome dinner for participants**

## **5<sup>th</sup> November**

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*The aim of this day is to discuss the current threats, conservation issues and the best way forward to ensure the continued existence of wild cat populations in Sabah.*

*Chair: Professor Dr. David Macdonald, Director of the Wildlife and Conservation Research Unit, University of Oxford, UK*

**08:30 Refreshments**

**08:45 Review of the previous day's presentations and goals for the day**

*Professor David Macdonald, Director of the Wildlife and Conservation Research Unit, University of Oxford, UK*

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### ***Third session: Other research and conservation efforts***

**09:00 The SAFE Project: Stability of Altered Forest Ecosystems**

*Dr. Glen Reynolds, Royal Society SEARRP*

**09:30 Preliminary results of Sabangau Felid Project surveys**

*Susan Cheyne, OuTrop/ Wildlife Conservation Research Unit*

**10:00 Distribution, Population Status and Conservation Genetics of Bornean Wild cats in Sabah, Malaysia**

*Daniel Pamin, ITBC, UMS/ Bornean Wild Cats and Clouded Leopard Project*

**10:30 Break for refreshments**

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### ***Fourth Session: Discussion***

**11:00 Discussion I: Threats to Bornean Wild Cats**

**11:45 Discussion II: Conservation Requirements on Bornean Wild Cats**

**12:30 Discussion III: Future research**

**13:15 Break for lunch**

**14:45 Agreed resolutions to benefit the conservation of Wild cats in Sabah**

**16:15 Break for refreshments**

**16:45 Workshop summary and concluding remarks**

*Professor David Macdonald, Director of the Wildlife and Conservation Research Unit, University of Oxford, UK*

**17:00 Day end**

# **First Steps towards the Conservation of Wild Cats in Sabah**

## **Report of the Inaugural International Workshop on the Bornean Wild Cats**

**4<sup>th</sup> – 5<sup>th</sup> November 2009, Lembah Impian, Kota Kinabalu, Sabah,  
Malaysia**

### **Introduction**

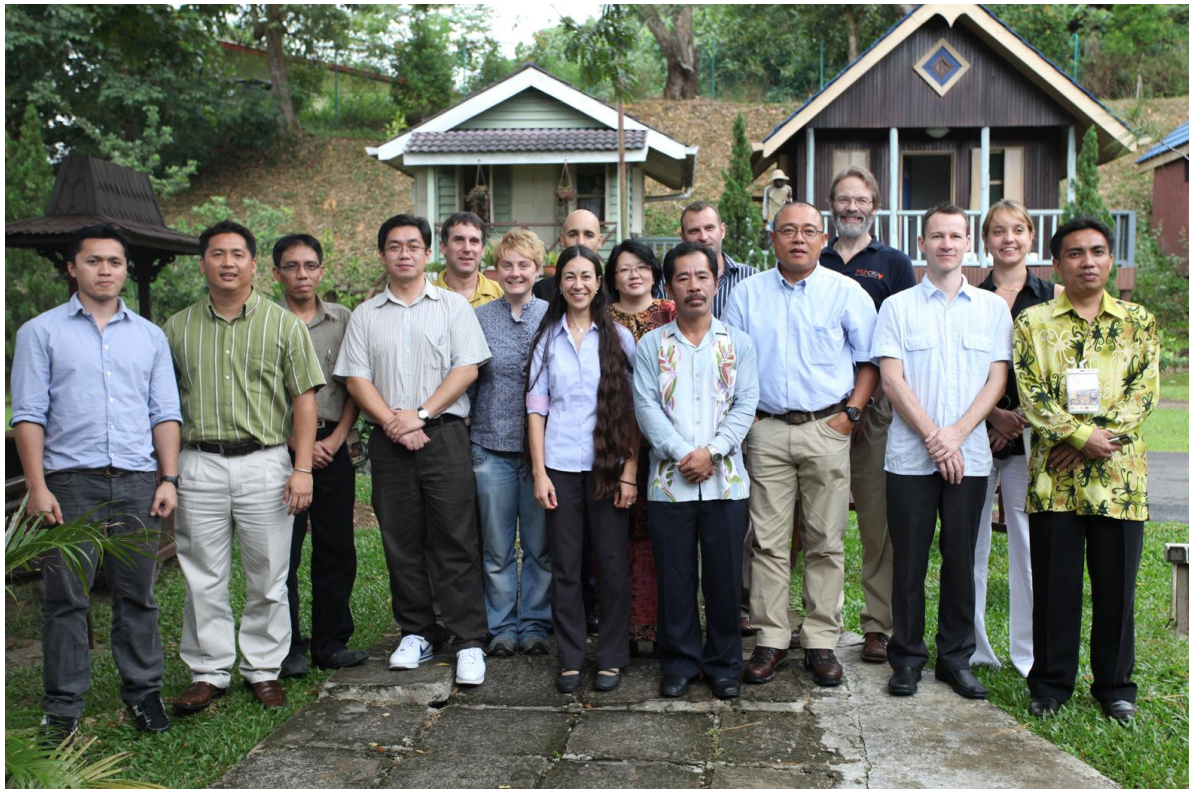
An inaugural workshop focusing on the Bornean wild cats was held in Penampang, Sabah, Malaysian Borneo on the 4 - 5<sup>th</sup> November, 2009. The international workshop, entitled *First Steps Towards the Conservation of Wild Cats in Sabah*, was hosted by the Sabah Wildlife Department in collaboration with the Global Canopy Programme's (GCP) Bornean Wild Cats and Clouded Leopard Project, the Universiti Malaysia Sabah and the Wildlife Conservation Research Unit (WildCRU) at Oxford University. The primary purpose of the workshop was for the first time to provide a forum to discuss the conservation needs of the Bornean wild cats and to bring together key stakeholders to begin formulating conservation strategies to help conserve wild cat populations in Sabah.

### **Workshop Rationale**

A unique guild of five wild cat species inhabit the rainforests of Borneo: Sunda clouded leopard *Neofelis diardi*, marbled cat *Pardofelis marmorata*, bay cat *Pardofelis badia*, flat-headed cat *Prionailurus planiceps*, and leopard cat *Prionailurus bengalensis*. Two are considered by the IUCN as *Endangered*, two as *Vulnerable* (IUCN 2009), and their presumed primary habitat is rapidly being lost and/or altered in the region. Thus, the main threats to the Bornean wild cats are believed to stem from habitat degradation and fragmentation as a result of widespread timber harvesting and conversion for agriculture (Nowell and Jackson, 1996). As a consequence Borneo's forests are under increasing pressure; while in the mid 1980s forests still covered nearly three quarters of the island, today only 52% of Borneo remains forested (Rautner et. al., 2005). Hunting of wild cats and their prey may also pose a potential threat. These threats are exacerbated by the lack of knowledge regarding the status and ecology of these felids, which is needed to facilitate the development of effective management and

conservation measures. Indeed, the flat-headed cat and endemic bay cat are arguably two of the world's least known felids (Sunquist and Sunquist, 2002; Wilting et al 2010).

In recent years several independent Bornean wild cat focused conservation initiatives have taken place in the Malaysian state of Sabah. These conservation and research programmes, involving multi-collaborations between the GCP, WildCRU, ITBC of UMS, University of Würzburg, Leibniz Institute for Zoo and Wildlife Research and the Sabah Wildlife Department have brought Sabah to the forefront of the challenge to understand this little known felid guild. With this increasing body of knowledge and expertise in the state it became clear that a workshop to bring together key stakeholders and to provide a forum to begin formulating conservation strategies to help conserve wild cat populations in Sabah was timely. It was envisaged that this workshop will be the first step towards the development of a wild cat Action Plan for Sabah.



*A selection of the delegates, who braved the rain. © WWF-Malaysia/Lee Shan Khee*

## Workshop objectives

The workshop was a key output for the Darwin Initiative funded 'Bornean Wild Cats and Clouded Leopard Project' and provided a platform to disseminate the findings from three years of field work. Other key workshop objectives were:

To bring together key stakeholders to discuss the conservation needs of the Bornean Wild Cats in Sabah.

To collate all available information regarding the ecology and conservation status of the five species of Bornean wild cat, with a specific focus on populations in Sabah.

To identify current gaps in the knowledge base regarding Bornean Wild cats and formulate future strategies to address these gaps

To jointly produce a series of resolutions pertaining to the conservation of the Bornean wild cats in Sabah



*The four threatened species of wild cat that inhabit the island of Borneo. Clockwise from top left: bay cat, Sunda clouded leopard, flat-headed cat, marbled cat. Flat-headed cat © Jim Sanderson; all other cat images © J. Ross and A.J. Hearn*



## Workshop structure

The workshop was hosted by the Sabah Wildlife Department in collaboration with the Global Canopy Programme's Bornean Wild Cats and Clouded Leopard Project, the Universiti Malaysia Sabah and the Wildlife Conservation Research Unit (WildCRU) at Oxford University. In attendance were 28 delegates, including representatives of the key state bodies responsible for the management of Sabah's forests and wildlife, including the Sabah Wildlife Department, Sabah Forestry Department and Sabah Parks, in addition to Malaysian and International scientists and representatives of local and international conservation NGOs. The workshop was officiated by State Tourism, Culture and Environment Assistant Minister, Datuk Ellron Alfred Angin, and the SWD Deputy Director, Augustine Tuuga, provided the welcome. Professor David Macdonald, Director of the WildCRU chaired the meeting.

The workshop was convened over two days and over four sessions. Sessions one to three consisted of oral presentations and took place during the first day and morning of the second day. The first session provided an opportunity for individuals to present recent and ongoing research regarding Bornean wild cat status, ecology, responses to habitat modification and conservation needs in Sabah. In the second session representatives of the Sabah Wildlife, Sabah Parks and Sabah Forestry Departments gave presentations regarding their Department's respective roles in the conservation and management of the Bornean felids in Sabah. A third session provided an opportunity for individuals to present other relevant ongoing and planned research efforts. The presentation sessions were followed by panel question and answer sessions. The bulk of the second day was given over to the fourth and



*Talks during the discussion session. © WWF-Malaysia/Lee Shan Khee.*

last session in which delegates were presented with the task of discussing the following: (i) Threats to Bornean Wild Cats in Sabah; (ii) Conservation Requirements of Bornean Wild Cats; (iii) Future research. Delegates were then asked to draw up a series of resolutions based on the above headings. The workshop resolutions are presented below.

# Opening Speech by Assistant Minister of Tourism, Culture and Environment, YB Datuk Ellron Alfred Angin

Good morning and SELAMAT DATANG, to all the distinguished guests, delegates, participants and friends, who have made the effort to attend this important occasion – the first International Workshop on the conservation of Bornean wild cats, entitled: 'First Steps Towards Conserving Bornean wild cats in Sabah, which is being run in collaboration with the University of Malaysia Sabah, Sabah Wildlife Department and the Global Canopy Programme's, Bornean Wild Cat and Clouded Leopard Project.

It gives me great pleasure to be here today at the launch workshop. I am informed that its purpose is for the first time, to bring together key stakeholders from Malaysia with wild cat experts, to discuss the conservation needs of the Bornean felids in Sabah; to provide a platform to disseminate initial findings from previous and current Bornean wild cat research; to identify current gaps in the knowledge-base regarding the Bornean Wild cats, to formulate future strategies to address these gaps and to identify the steps required to ensure the continued presence of this unique guild of felids in Sabah, and indeed, on Borneo.

**Distinguished guests,  
ladies and gentlemen,**

Please allow me to focus your attention on a brief background of the subject of our assemblage today, the Felidae or family of wild cats.

There are 41 known species of felids in the world today, which have all descended from the same ancestor. This taxon originated in Asia and spread across continents by crossing land bridges. Testing of mitochondrial and nuclear DNA has demonstrated that ancient cats evolved into eight main

lineages that diverged in the course of at least 10 migrations from continent to continent via the Bering land bridge and Isthmus of Panama, with the *Panthera* genus in Latin America being the oldest and the *Felis* genus, being the youngest. It has been estimated that 60 percent of the modern species of cats evolved within the last million years.

Wild felids are native to every continent except Australia and Antarctica living in relatively inaccessible habitats with around three-quarters of cat species living in forested terrain. They are purely carnivorous animals and as predators at the top of the food chain they play important roles in regulating the populations of other mammals, and consequently have an important role in the complex web of life. Over millions of years wild cats have evolved morphological and behavioural adaptations to enable them to remain undetected whilst they stalk their prey so, as a result they are highly secretive and elusive, and as top predators, often found at low densities, making them particularly difficult to study, and rarely seen.



Assistant Minister for Tourism, Culture and Environment, Datuk Ellron Alfred Angin (left), being presented with a token of thanks by the Deputy Director of the Sabah Wildlife Department, Augustine Tuuga (middle), with the workshop chair, Professor David Macdonald looking on (right). © WWF-Malaysia/Lee Shan Khee.

Nowhere is this more true than that of the wild cats that are found throughout the tropical forests of south east Asia and in the forests of Borneo.

The forests of Borneo contain a guild of five felid species: clouded leopard, bay cat, flat headed cat, marbled cat and leopard cat. Nowhere else on Earth is this particular assemblage of cat species found together. As recently as 2006 the Sunda clouded leopard was declared a new species, distinct from the clouded leopard found on mainland SE Asia, This species is the largest of the Bornean felids, and is found only on the islands of Sumatra and Borneo. This reclassification has elevated the conservation concern for this species.

Despite their charismatic nature very little is known about any of these species. Incredibly, a live Bay cat was not photographed until 1998 and was not photographed in the wild until 2002 by an amateur photographer in Mulu National Park, Sarawak. A bay cat was first photographed by a camera trap as recently as 2003, in Kalimantan, whilst it was only first photographed in Sabah, in the Danum Valley, in 2006 by the Bornean Wild Cat and Clouded Leopard Project. Shrouded in mystery, apparently this small grey or red cat was once widespread throughout the island of Borneo, although it appears to have always been rather rare, and unknown to many native peoples of Borneo. Only intense camera trapping surveys can reveal the presence of this mysterious cat, and today there are still only 38 camera trap photographs in the wild, and a few seconds of video.

The flat-headed cat is another small, apparently rare wild cat that makes Borneo its home. This felid's distribution is restricted to Peninsular Thailand and Malaysia, Borneo and Sumatra. This small cat is a specialist fish-eater, with semi-retractable claws, relatively large and sharp premolars and slightly webbed feet. The flat-headed cat is thought to prefer wetlands and rivers in low lying forest areas, habitats which are often the first to be lost to development, and, in common with the bay cat this species is also rarely captured by camera trap, leading

scientists to believe this wild cat is under significant danger of extinction.

The third threatened Bornean wild cat is the marbled cat, which has a wider distribution, being found from the forests ranging from north-east India and Nepal throughout South-east Asia including Borneo and Sumatra. Again, this cat appears to be extremely rare, and is only occasionally detected by camera traps. This may, at least in part, be a reflection of its tree climbing habits, meaning that it is less likely to be photographed on the ground, for the marbled cat has arboreal talents rivalling that of the margay in South America.

Sadly, we are still unaware of the population sizes of these cats and we are only now beginning to shed light on their ecology. This information is crucial for us to work together to help conserve them. This must change, and I hope this workshop will help to pull together all of the information known on these cats to help inform the Sabah Wildlife department in its development of effective conservation strategies and to devise future steps to safeguard the persistence of this unique guild.

### **Distinguished guests, ladies and gentlemen,**

The conservation status of these cats is becoming critical and we no longer have the luxury of time to see what the effect of landscape alteration will have on these populations. In a recent review of the status of the world's wild cats the IUCN classified the bay cat and flat-headed cat as 'Endangered', whilst the clouded leopard and marbled cat were listed as 'Vulnerable', due to the fact that their presumed primary habitat is rapidly being lost, fragmented and/or altered in the region. Bornean wild cat habitat is diminishing as the increasing growth of the human population places increasing demands on the remaining forests. Forests are logged, plantations (such as tea, rubber, oil palm and coffee) are established, infrastructure (for example dams, roads, and mines) and houses are constructed over crucial wild cat habitat, driving the animals into ever smaller fragmented spaces. Wild Cat populations are inevitably becoming isolated, so much so

that the gene pool may be declining which will result in populations being unable to sustain themselves. We must try to work together to ensure no more forests are converted to plantations, to give these populations a chance. Although our generation will not witness the last of these creatures, ours will be the one to decide their fate. Will we stand by and watch as the remaining remnants of tropical forest habitat and its inhabitants are destroyed or will we have the innovative imagination and the courage to find a better way to utilise existing cleared land and maintain what little forest is left?

The Malaysian Government has recognised the importance of all of Malaysia's unique and wonderful biodiversity and indeed we are a signatory to the United Nations Convention on Biological Diversity. This workshop will be helping the Malaysian Government in meeting its obligations to this convention by gaining a greater understanding of the critical thresholds of forest biodiversity and loss and change, by paying particular attention to the endemic and threatened species. By coming together you will also be helping the Government determine the status and conservation needs of the cats which are endemic and threatened and the impact of current forest management practises on these species. The Government will need to develop and implement conservation strategies for these endemic and threatened species for global and regional application and practical systems of adaptive management, and it is hoped that this workshop will be the first step towards this goal for the Bornean wild cats, which are vital flagship species for Sabah's biodiversity.

**Distinguished guests, ladies and gentlemen,**

As a means to help with getting to grips with the scale of the problem and understanding the full extent of our knowledge that needs to be gained, it is hoped that collaboration will be forged during this workshop between Sabah Wildlife Department, the University of Malaysia Sabah, the Bornean Wild Cats and

Clouded Leopard Project of the Global Canopy Programme, the Wildlife Research Conservation Unit at the University of Oxford, the Sabah Forestry Department, Sabah Parks and Yayasan Sabah.

**Distinguished guests, ladies and gentlemen,**

The future of the Bornean felid guild in Sabah is uncertain. One thing is clear though, the threatened members of the Bornean felid guild can only be secured through collaboration of conservation efforts. All your inputs will be invaluable and will be taken for consideration in preparing the next course of action. It is my ardent hope and expectation that all the participants to this workshop will generate a workable set of recommendations for the conservation of these charismatic and rare cats.

Before I conclude, I would like to congratulate all of you for the hard work in Bornean wild cat conservation efforts, and thank you all for coming.

I therefore hope that in the course of your deliberations for the rest of the workshop, you will be able to find amicable solutions and that you have a better understanding of the situation in Sabah.

I would like to make a special thanks to the donors who have made this groundbreaking workshop possible; the Darwin Initiative of the UK Government and the Institute for Tropical Biology and Conservation at the University of Malaysia Sabah.

For those of you coming from outside Sabah, please try to find time off to visit our beautiful parks and sanctuaries if you have not already done so.

With these remarks, ladies and gentlemen, it is now my great pleasure to launch the Bornean wild cat workshop entitled: 'First Steps towards the Conservation of Wild Cats in Sabah' and I wish you all successful and fruitful discussions.

Thank you.

Resolutions arising from the First International workshop  
focused on the Bornean Wild Cats, entitled:  
First Steps Towards the Conservation of Wild Cats in  
Sabah.

*4-5<sup>th</sup> November, Penampang, Sabah, Malaysia*

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**Threats to the Bornean wild cats in Sabah**

Delegates agreed that, historically, the main threat to Sabah's felids has been loss of habitat through large scale forest loss, fragmentation and degradation. However, in Sabah this process of large scale forest conversion is now coming to an end, although it is likely that the consequences of this forest loss to Sabah's wild felid populations will never become fully clear.

Therefore, delegates foresee a future, at least over the next five years, in which the main threats to the wild cat populations of Sabah will stem from fragmentation of remaining forests, fire, hunting and persecution. There will be regional differences in the severity of each threat and some areas of Sabah may experience cross-border incursions; these differences and the prevalence of cross-border activities are, as yet, unclear.

The effects to the genetic structure of Bornean wild cats as a result of forest fragmentation are currently unknown, but it is likely that, akin with other wildlife, fragmentation of wild cat habitat will result in reduced gene-flow and genetic variability. Forest fragmentation draws human and wildlife populations into ever closer proximity and consequently wild cats will be increasingly exposed to anthropogenic threats. These will comprise, but are not limited to, increased hunting activities, including both direct hunting of felids and hunting of wild cat prey; disease transmission from populations of feral cats and dogs; predation upon wild cats by feral dogs; pollution of water sources (this is particularly relevant to flat-headed cats) and an increased incidence of road traffic accidents. There may also be increased conflicts between wild cats and human populations.

Climate change may also pose a significant threat, in particular, within areas of low-lying forest, where, it is highlighted, all five species of wild cat are found.

**Conservation requirements of Bornean wild cats in Sabah**

*Monitoring, surveillance and policing*

Delegates endorse and support the Sabah Wildlife Department's efforts to monitor and reduce activities regarding illegal hunting and the illegal pet trade. It is understood that resources are

often limited and it is agreed that suitable and sufficient assets should be made available in order for policing of illegal activities to be the most effective.

### ***Education***

Delegates advocate the fullest possible development and use of high calibre educational materials to enable the citizens of Sabah to better understand the unique guild of the five cat species, in particular the Sunda clouded leopard, which has the potential to be promoted as a flagship for felid conservation. These education activities should be targeted to both adults and schools and, in areas with high hunting activity, an emphasis should be placed on alerting individuals to the illegality of the hunting, and the wider consequences of hunting to biodiversity conservation.

### ***Ex-situ conservation***

Illegally held or injured clouded leopards are occasionally found and confiscated by Sabah Wildlife Department. To date, none of these animals have been suitable for release to the wild. Delegates encouraged Sabah Wildlife Department that whenever possible and appropriate the captive animals should be used for educational purposes. Re-introduction of captive bred animals is a complex and often controversial issue and delegates do not feel that there is currently the expertise to attempt this, nor indeed, a requirement for such a programme on Borneo. However, it was agreed that a plan for a future captive breeding and re-introduction programme should be constructed and advice for this should be sought from existing breeding programmes such as the Thailand Clouded Leopard Breeding Project and the programme at Howletts Wild Animal Park to ensure the most successful outcome.

Captive breeding provides an excellent educational opportunity, however, it is imperative that the animals are in good health and housed appropriately, both for the well-being of the animals and for the success of any breeding programme. In addition, inappropriate housing is likely to cause negative publicity which would be counterproductive in terms of education.

### ***Forest Restoration***

Forest fragmentation has been, and still is, albeit to a lesser extent, a threat to wild cat populations and therefore there is a requirement for forest restoration. Forest restoration comprises two main forms. One includes, but is not limited to, replanting of degenerated areas and climber cutting within these areas; the other is the reconnection of forest fragments. The first type of restoration is already ongoing in several areas of Sabah with positive results. The creation or restoration of existing, but degraded, forest fragments is important for two main reasons. The first is to increase the size and quality of fragments so reducing potential edge effects, the incidences of human-wildlife contact and the associated detrimental impacts of these. The second is to allow gene flow between isolated animal populations, thereby reducing the possibility of inbreeding depression and other negative processes that affect small populations.

Delegates encouraged all researchers and agencies within Sabah to be alert to the possibilities of reconnecting areas of forest, within the context of wider reconnection schemes, whenever possible. It was noted that it is also important to maintain connectivity along an altitudinal gradient as an important strategy to help mitigate the potential effects of climate change.

## **Future research regarding Bornean wild cats in Sabah**

Delegates discussed the need for the expansion of existing camera trapping surveys into different habitats and different regions across Sabah. Conducted within a highly collaborative framework, these surveys will build upon existing information and will provide baseline information on status, community structure and ecology of Bornean felids. It was proposed that information arising from such surveys should possibly be collated and held on an accessible database to avoid needless duplication of research and to assist researchers in the future in identifying priority research areas.

In conjunction with scientific research, social science research needs to focus on the attitudes and perceptions of local people and the most productive way to alter these for the benefit of felid conservation, if deemed necessary. Future conservation strategies should be formed from an amalgamation of scientific and social studies to be as effective as possible.

A second workshop is planned for 2011. It is hoped that by this time additional research will have further elucidated Bornean felid ecology and also have identified areas of value with regard to conservation corridors and forest connectivity.

# Abstracts

## The Bornean Wild Cats and Clouded Leopard Project: An introduction

Joanna Ross<sup>1, 2, 3\*</sup> and Andrew J. Hearn<sup>1, 2, 3</sup> and Henry Bernard<sup>4</sup>

<sup>1</sup> *Bornean Wild Cat and Clouded Leopard Project*

<sup>2</sup> *Global Canopy Programme, John Krebs Field Station, Wytham, Oxford, OX2 8QJ*

<sup>3</sup> *Wildlife Conservation Research Unit, Department of Zoology, University of Oxford, The Recanati-Kaplan Centre Tubney House, Abingdon Road Tubney, Abingdon OX13 5QL, UK*

<sup>4</sup> *Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah*

\* *Presenting author*

### Abstract

The tropical forests of the island of Borneo support five species of wild cat: The Sunda clouded leopard, marbled cat, leopard cat, flat-headed cat and the endemic bay cat. Two of these cats, the clouded leopard and marbled cat, are classified by the IUCN as *Vulnerable* and two, the bay cat and flat-headed cat, as *Endangered*. Throughout their range these felids are being threatened by habitat loss and modification and to a lesser extent by hunting, although it remains unclear how these threats are impacting cat populations. All of these cats, with the exception of the leopard cat, are elusive and rarely seen; these factors in conjunction with low population densities make these animals difficult to study and as a result there is very little information available regarding their ecology. A collaborative effort between The Global Canopy Programme, The Institute for Tropical Biology and Conservation at Universiti Malaysia Sabah, The Sabah Wildlife Department and The Wildlife Conservation Research Unit at Oxford University, entitled the Bornean Wild Cats and Clouded Leopard Project was initiated to address this lack of knowledge through an ecological research programme largely based around camera trap surveys and live trapping and radio tracking.

The camera surveys were conducted in five different areas: Danum Valley Conservation Area, Ulu Segama Forest Reserve, Malua Forest Reserve, Danum Palm Plantation and Tabin Wildlife Reserve. Over 17,000 camera trap nights resulted in over 35,000 photographs of wildlife with 96 species being recorded; these included the first ever images of the bay cat in Sabah and also the first and to date, the only video footage in the world of the bay cat. Also achieved was the first camera based density estimate for the Sunda clouded leopard and the leopard cat. The radio tracking programme was concentrated in the Ulu Segama Forest Reserve; the outcome of this was 10 collared animals: nine leopard cats and the first Sunda clouded leopard.

Also included in the project were significant aspects of education and capacity building. A field course was developed for UMS undergraduate students which covered a range of common field research techniques and gave students hands on experience with these methods. In collaboration with the Clouded Leopard Project, a bilingual, illustrated children's story book was produced for distribution within existing environmental education programmes.

Over the three years that the project has been running we have made substantial progress towards better understanding the wild cats of Borneo, which will hopefully assist in the future conservation of these species.



## **The Bornean Wild Cats & Clouded Leopard Project: Initial findings from three years of field work**

Andrew J. Hearn<sup>1,2,3,\*</sup> and Joanna Ross<sup>1,2,3</sup> and Henry Bernard<sup>4</sup>

<sup>1</sup> *Bornean Wild Cat and Clouded Leopard Project*

<sup>2</sup> *Global Canopy Programme, John Krebs Field Station, Wytham, Oxford, OX2 8QJ*

<sup>3</sup> *Wildlife Conservation Research Unit, Department of Zoology, University of Oxford, The Recanati-Kaplan Centre Tubney House, Abingdon Road Tubney, Abingdon OX13 5QL, UK*

<sup>4</sup> *Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah*

\* *Presenting author*

### **Abstract**

We used camera trapping and radio tracking approaches in an attempt to elucidate the conservation status, activity, spatial ecology and responses of Bornean felids to habitat modification. Data continue to be analysed, and conclusions drawn, but a number of key findings are already clear, and are presented here. We developed a camera-trapping protocol suitable for the densely vegetated forests of Sabah and used photographic capture–recapture surveys to successfully estimate Sunda clouded leopard populations in three Forest Reserves experiencing different levels of anthropogenic management. Our results provide tentative evidence for a reduction in Sunda clouded leopard density associated with recent logging and higher poacher activity. Intensive camera surveys revealed that all five members of the Bornean felid guild can be found in selectively logged forest, further highlighting the conservation importance of this habitat. Leopard cats were the only felids photo captured during a three month camera survey of an oil palm plantation, highlighting the potential risk to threatened Bornean felids posed by future expansion of oil palm plantations in the region. We present the first data on Bornean felid activity based on camera data, and suggest that variations in temporal activity may be a mechanism of reducing interspecific competition in the Bornean felid guild. During the study we radio-tagged the first ever Sunda clouded leopard, and present the first data on this felid’s activity, range size and intraspecific range overlap. This study has established an important benchmark as a foundation for a long-term monitoring programme for clouded leopards and other threatened felids in Sabah.

### **Genetics, modelling and field research; a cocktail aiming to assist the protection of carnivores in Sabah.**

Andreas Wilting<sup>1\*</sup>, Azlan Bin Mohamed<sup>2,3</sup>

<sup>1</sup> *Leibniz Institute for Zoo and Wildlife Research, Alfred-Kowalke-Str. 17, 10315 Berlin, Germany.*

<sup>2</sup> *Institute for Tropical Biology and Conservation, University Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia.*

<sup>3</sup> *WWF Malaysia*

\**Presenting author*

### **Abstract**

Due to their secretive, mostly nocturnal behaviour and their restriction to tropical rainforests very little is known about South-East Asian carnivores, especially of Bornean felids and viverrids. In strong collaboration with the Sabah Wildlife Department, the University Malaysia

Sabah and the Sabah Forestry Department we try to gain some first important data of these carnivores on their molecular genetics, their distribution using GIS modelling and their ecology during our field work project ConCaSa (Conservation of Carnivores in Sabah). Here I will focus on our molecular research and our first GIS modelling efforts.

Within the molecular approach we establish a molecular database for South-East Asian cats and civets to revise their taxonomy, which is currently mainly based on early descriptions of museum specimens. Such a database can serve as a useful reference to trace back the origin of confiscated illegal traded animal parts. Our research results on clouded leopards (*Neofelis* sp.) provide a good example how important basic *ex situ* molecular research can be for the management and conservation of threatened species. The genetic split of clouded leopards into two species (*N. nebulosa* on mainland South-East Asia and *N. diardi* on Borneo and Sumatra) necessitates a separate management of the two distinct species and puts both species, due to smaller distribution ranges associated with reduced gene pools, under a higher risk of extinction. Furthermore, the population genetic partition between Borneo and Sumatra clouded leopards supports the recognition of two subspecies; *N. diardi diardi* on Sumatra and *N. diardi borneensis* on Borneo. During the next years we are planning to expand our molecular work to the other Bornean cat species, and also to their relatives the Viverridae.

Additionally the focus will be on the flat-headed cat (*Prionailurus planiceps*) as one of the world's least known cat species, which has a restricted distribution to tropical lowland rainforests in Peninsula Thailand / Malaysia, Borneo and Sumatra. Its habitat preferences marked by a close association with open water sources put a substantial pressure on this small cat species, as these habitats are greatly affected by anthropogenic modifications (landscape transformation and fragmentation, pollution of fresh-water river systems). This raises concerns regarding its conservation status throughout its geographic range. To reassess the potential current distribution and conservation status of the flat-headed cat we designed a model using the Maxent algorithm for predictive species distribution modelling. Species occurrence samples (87 independent records) were gathered from field surveys, literature records and museum collections. These current and historical records were used together with bioclimatic variables, altitude, and distance to larger water sources to model the potential distribution of the flat-headed cat. The most important bioclimatic variables determining broadly the presence of flat-headed cats, were the distance to water sources and the precipitation of the driest month. As a second step, we analyzed different land cover maps, information on the different protective status of the forests and regional human population density data in the ArcGIS environment to extract currently suitable habitats from the initially predicted distribution. Between 57 % and 67 % of suitable habitat has already been converted to unsuitable land cover (e.g. croplands, plantations), and only between 10 % and 16 % of suitable land cover is categorised as fully protected according to the IUCN criteria. The remaining habitats are highly fragmented and only a few larger forest patches remain. A special focus will be on the key localities indicated by our model for Sabah, because further conservation efforts including ground surveys should put an enhanced focus on these areas. We believe the flat-headed cat can serve as a flagship species for the protection of several other endangered species such as the otter civet (*Cynogale bennettii*) associated with the threatened tropical lowland forests and surface fresh-water sources in this region.

## Can commercial forest reserves contribute to the conservation of Bornean felids?

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### Abstract

Many carnivores are under severe threat from permanent loss of suitable habitat. Especially in South-East Asia large tracts of forest were converted mostly into palm oil plantations during the past three decades. As a result, the remaining protected areas are scattered and highly fragmented. Due to their occurrence in low densities, carnivores require usually large tracts of suitable habitat for their survival, and therefore protected areas alone might not be large enough to support viable populations on a long term perspective. However, in the Malaysian state of Sabah more than 40 % of the area is still covered by forests, of which most are categorized as commercial forests reserves (FR). Previous research has shown that clouded leopards and also some of the other Bornean cat species can also be found in these commercially used areas. With this prospect in mind, the project ConCaSa (Conservation of Carnivores in Sabah) which started in July 2008 aims to investigate the value of commercially used areas for the conservation of Bornean wildcats and other carnivores. Furthermore this project wants to evaluate, if the logging method (reduced impact logging RIL vs. conventionally logging) and the forest conditions affect the diversity and abundance of the different species. Therefore, we are conducting our studies in three adjacent commercial FR (Deramakot FR, Tangkulap FR and Segaliud Lokan FR) which were subjected to different management regimes in the past. These three forest reserves located in the centre part of Sabah form one of the few remaining inland lowland forest blocks on Borneo and are the only extreme lowland forests within the Heart of Borneo initiative. Here we present our preliminary findings from our research activities in Deramakot FR and Tangkulap FR.

In Deramakot FR we recorded all 5 Bornean cat species, whereas the bay cat (*Pardofelis badia*) was not recorded during our surveys in Tangkulap. The leopard cat (*Prionailurus bengalensis*) was the most common felid species and our results indicate that the abundance of this species might be comparable between the two sites. In contrast, in Tangkulap FR we have recorded four individual clouded leopards compared to only one adult male clouded leopard in Deramakot FR. These low numbers together with the estimated large home-ranges show that large forest blocks are required to contain viable populations of clouded leopards. In both study sites we photographed the endangered flat-headed cat (*Prionailurus planiceps*) several times, indicating the importance of these lowland forests for this species. The marbled cat (*Pardofelis marmorata*) was mainly recorded during night spotlight surveys resting in the canopy. Only one camera-trapping photograph was obtained of this species in Tangkulap FR. In addition to the camera-trapping and night-spotlight surveys we collected over 230 carnivore faecal samples, which will be used for further molecular and diet analysis. Generally our results show the importance of commercial forest reserves for the protection of Bornean felids and a long term sustainable forest management of these areas should be achieved.

**The Role of the Sabah Forestry Department in the Conservation and Management of Sabah's Wild Cats.**

Mr. Peter Lagan

*Sabah Forestry Department*

**Abstract** *Not available*

**The Role of Sabah Wildlife Department in the Conservation and Management of Sabah's Wild Cats.**

Augustine Tuuga<sup>1</sup>

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**Abstract** *Not available*

**The Role of Sabah Parks in the Conservation of Sabah's Wild Cats.**

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**Abstract** *Not available*

**The SAFE Project: Stability of Altered Forest Ecosystems**

Dr Rob Ewers<sup>1</sup>, Dr Glen Reynolds<sup>2</sup> and Dr Waidi Sinun<sup>3</sup>

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**Abstract** *Not available*

**Sabangau Felid Project – preliminary results 2008-2009**

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**Abstract**

A study to identify the felid biodiversity of the Sabangau forest, Central Kalimantan, Indonesia, was initiated in May 2008. A total of 44 cameras are being used: 22 in fixed locations for the duration of the study and 22 roving cameras to survey more of the forest which are in place for 45-day cycles. We have confirmed sightings of clouded leopards, leopard cats, marbled cats and flat-headed cats, representing four of the five wild felids of Borneo. The long-term use of

fixed and roving cameras has provided insight into the movements, occurrence and activity patterns of these elusive felids within a disturbed peat-swamp forest. Clouded leopards were the most commonly photographed felid (42% of records) followed by leopard cats (40%), flat-headed cats (14%) and marbled cats (4%). Large parts of the Sabangau remain unprotected and little is known about their distribution throughout the rest of the forest. I will discuss the threats to the felids, and the aims of the Sabangau Felid Project. The data presented here will assist in the understanding of these felids and can assist in future protection of this area.

## **Distribution, Population Status and Conservation Genetics of Bornean Wild Cats in Sabah, Malaysia**

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### **Abstract**

This study will investigate the population genetic structure of Bornean wild cats in four target study areas in Sabah (Danum Valley, Tabin Wildlife Reserve, Crocker Range Park, and Maliau Basin). Sundaland clouded leopard (*Neofelis diardi*), Bay cat (*Pardofelis badia*), Flat-headed cat (*Prionailurus bengalensis*), Marbled cat (*Pardofelis marmorata*), and Leopard cat (*Prionailurus bengalensis*), are five species of wild cats inhabiting these areas with facing under severe threat from permanent loss of suitable habitat by human activities. Living in low densities, elusive and nocturnal habits, as well as persistence in remote tropical forest have made these species extremely difficult to directly monitor their population. In recent years, molecular techniques have demonstrated that using non-invasive sampling, mainly from faeces and hairs, have proved to be applicable in measuring important population parameters. This study's goal is to increase understanding of the wild cats in Sabah using molecular genetic analysis as main approach. The implication of the forthcoming results will hopefully be to better assess the impacts and help inform management plans to better protect these species.

# List of Workshop delegates

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