

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/236884172>

# Bornean felids in and around the Imbak Canyon Conservation Area, Sabah, Malaysia

Article · January 2013

CITATIONS

7

READS

205

5 authors, including:



**Henry Bernard**

Universiti Malaysia Sabah (UMS)

**121** PUBLICATIONS **1,337** CITATIONS

[SEE PROFILE](#)



**Jedediah Brodie**

University of Montana

**121** PUBLICATIONS **1,847** CITATIONS

[SEE PROFILE](#)



**Anthony J. Giordano**

Texas Tech University

**89** PUBLICATIONS **466** CITATIONS

[SEE PROFILE](#)



**Abdul Hamid Ahmad**

Universiti Malaysia Sabah (UMS)

**47** PUBLICATIONS **435** CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Urban ecology in tropical cities: landscape tools of conservation development [View project](#)



ConservationFIT: Developing footprint identification algorithms to monitor endangered species [View project](#)

ISSN 1027-2992

# CAT

N° 58 | SPRING 2013

# news



SPECIES SURVIVAL COMMISSION



CAT SPECIALIST GROUP



**CATnews** is the newsletter of the Cat Specialist Group, a component of the Species Survival Commission SSC of the International Union for Conservation of Nature (IUCN). It is published twice a year, and is available to members and the Friends of the Cat Group.

**For joining the Friends of the Cat Group please contact Christine Breitenmoser at [ch.breitenmoser@kora.ch](mailto:ch.breitenmoser@kora.ch)**

Original contributions and short notes about wild cats are welcome

**Send contributions and observations to [ch.breitenmoser@kora.ch](mailto:ch.breitenmoser@kora.ch).**

**Guidelines** for authors are available at [www.catsg.org/catnews](http://www.catsg.org/catnews)

**CATnews** is produced with financial assistance from Friends of the Cat Group.

Design: barbara surber, werk'sdesign gmbh  
Layout: Christine Breitenmoser  
Print: Stämpfli Publikationen AG, Bern, Switzerland

**ISSN 1027-2992** © IUCN/SSC Cat Specialist Group

The designation of the geographical entities in this publication, and the representation of the material, do not imply the expression of any opinion whatsoever on the part of the IUCN concerning the legal status of any country, territory, or area, or its authorities, or concerning the delimitation of its frontiers or boundaries.

**Editors:** Christine & Urs Breitenmoser  
Co-chairs IUCN/SSC  
Cat Specialist Group  
KORA, Thunstrasse 31, 3074 Muri,  
Switzerland  
Tel ++41(31) 951 90 20  
Fax ++41(31) 951 90 40  
<[u.breitenmoser@vetsuisse.unibe.ch](mailto:u.breitenmoser@vetsuisse.unibe.ch)>  
<[ch.breitenmoser@kora.ch](mailto:ch.breitenmoser@kora.ch)>

**Associate Editors:** Keith Richmond  
Brian Bertram  
Sultana Bashir  
Javier Pereira

**Cover Photo:** First photographic evidence of a Pallas's cat in Bhutan. The animal was captured in Jigme Dorji National Park on 17.11.2012  
Photo: Jigme Dorji National Park

HENRY BERNARD<sup>1\*</sup>, JEDEDIAH BRODIE<sup>2</sup>, ANTHONY J. GIORDANO<sup>3,4</sup>, ABDUL HAMID AHMAD<sup>1</sup> AND WAIDI SINUN<sup>5</sup>

## Bornean felids in and around the Imbak Canyon Conservation Area, Sabah, Malaysia

**We photo-captured three of the five species of Bornean felids in and around the Imbak Canyon Conservation Area in central Sabah, Malaysian Borneo - the Sunda clouded leopard *Neofelis diardi*, marbled cat *Pardofelis marmorata* and leopard cat *Prionailurus bengalensis*. The Sunda clouded leopard was the most frequently photographed felid (11 photos), followed by marbled cat and leopard cat (2 photos each). The Sunda clouded leopard and marbled cat are classified as Vulnerable on the IUCN/SSC Red List of Threatened Species, whereas the leopard cat is a species of Least Concern (IUCN 2012). All three species were detected within primary and logged forest habitats. These findings may indicate that, in addition to primary forests, regenerating secondary forests are important to felids conservation.**

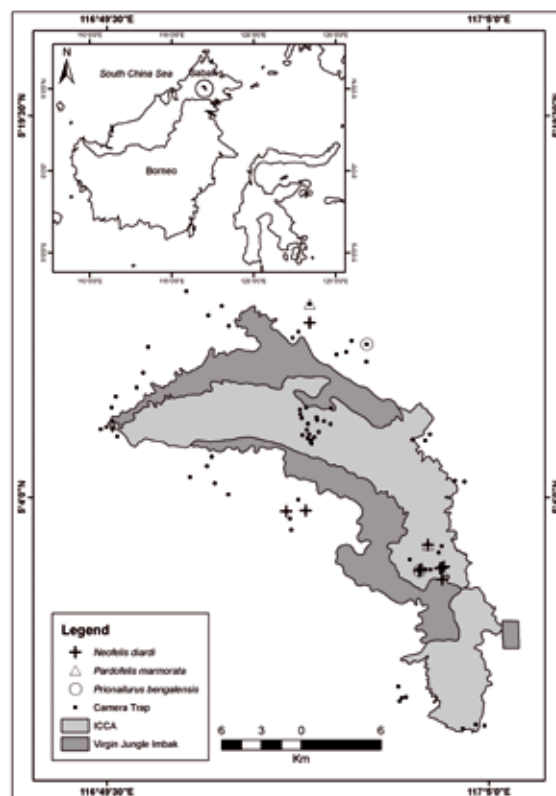
As part of a general wildlife survey conducted from July-September 2012, we recorded the diversity, composition and distribution of mammals in Imbak Canyon using camera-trapping techniques. The survey, which was intended to gather information to support the development of a biodiversity conservation management plan, was carried out in the primary and logged forest habitats in and around the Imbak Canyon Conservation Area (ICCA). Here we report our preliminary findings regarding the occurrence of Bornean felids in the region.

The approximately 300 km<sup>2</sup> ICCA was gazetted as a Class I (Protection) Forest Reserve by the Sabah state government in 2009, a declaration legally protecting it from logging activities (Latif & Sinun 2012). Located in central Sabah (5°01'35.9"N/117°02'41.8"E), Malaysian Borneo (Fig. 1), Imbak Canyon, together with Danum Valley Conservation Area (438 km<sup>2</sup>) and Maliau Basin Conservation Area (588 km<sup>2</sup>), represents a significant portion of the remaining primary tropical rainforest in Sabah. The ICCA is administered by Yayasan Sabah (or Sabah Foundation), a

statutory body of the Sabah state government that manages the area for conservation, research, training, education, and nature recreation.

Imbak Canyon is a crescent-shaped, elongated valley approximately 750 m deep, 3 km wide and 30 km long. The floor of the canyon lies about 250 m above sea level with the rim generally occurring at 1,000 m and the highest point at Mount Kuli (ca. 1,600 m). The forest type in the Imbak area is mostly primary lowland mixed dipterocarp rainforest and upper montane forest, including patches of montane heath or "Kerangas" forest. The forests surrounding the Imbak canyon have been disturbed mainly through selective logging, but also from the development of human settlements and large-scale agriculture.

We deployed 80 automatic motion-triggered digital camera traps of three commercial brand names (Bushnell Trophy CamTM - 30 units, Reconyx RM45 - 30 units, and Cuddeback Capture -20 units) in both the primary forest of Imbak Canyon and the logged forests surrounding the canyon (Fig. 1). Cameras were affixed to tree trunks close to the ground (< 0.4 m) and were installed in areas commonly frequented by animals such as along game trails, human-made paths along slopes and ridge-tops in closed-canopy forest, old logging roads, near stream beds and mud wallows, and under fruiting trees. Camera trap locations ranged between 123 m- 623 m above sea level, and the average distance between nearest traps was 819 m (Range: 134 - 3,047 m). All cameras were active 24hrs/ day and used either infrared or white flash at night. Cameras were programmed to take 1-3 pictures at every trigger depending on camera model with a minimum interval of 60 seconds between successive triggers. No bait or lures were used near cameras during the survey. To maximize temporal independence of capture events, multiple photos of the same species recorded at the same camera trap unit < 1 hour apart were treated as only one record. Based on an overall camera-trapping effort of 1,436 camera trap-nights (individual camera days in the field ranged from 10 to 62 days), we obtained a total of 1,641 digital photographs of mammal species, 564 or 34% of which were independent events. Of this number, we recorded three of the five species of Bornean felids in a total of 15 photographs (Supporting Online Material SOM Table 1): the Sunda clouded leopard,



**Fig. 1.** Imbak Canyon Conservation Area (ICCA), in central Sabah, Malaysian Borneo showing the distribution of three species of Bornean felids and locations of camera traps in and around the ICCA.

marbled cat and leopard cat (Fig. 2-4). All photographs of felids were of single individuals. No evidence of the Bornean endemic bay cat *Catopuma badia* or flat-headed cat *Prionailurus planiceps* was recorded during this survey. Both of these species have been photo-captured only occasionally in Sabah (Yasuda et al. 2007, Mohamed et al. 2009, Ross et al. 2010, Bernard et al. 2012) and elsewhere in Borneo (Azlan & Sanderson 2007, Cheyne et al. 2009, Brodie & Giordano 2012) suggesting that they might be rare (bay cat) or they are confined to certain habitat types (flat-headed cat).

Altogether the Sunda clouded leopard occurred in 11 independent photographs, including eight from primary forest in the central part of Imbak canyon, and three from logged forest sites outside the canyon. Variation in pelage patterns indicates that these photos are likely of five different individuals. Three of these individuals were recorded by camera-traps placed within a radius of 3.5 km in the primary forest on the southern slopes of Imbak Canyon, suggesting that their home ranges at least partially overlapped. The sexes of the clouded leopards could not be identified with certainty due to the poor quality of the photographs obtained. Marbled cat and leopard cat were each photographed only twice: once each in primary forest inside the canyon, and once each in logged forest sites outside the canyon.

All camera-traps in logged forest that recorded felids were located along abandoned logging roads. Canopy cover was either open or sparse along these roads, where the only existing vegetation included tall grasses, small trees, and shrubs (Fig. 2). Despite the open nature of this habitat along logging roads, this did not appear to act as an ecological barrier to cat movements in the Imbak area. In fact, a Sunda clouded leopard was photographed lying on the ground in the middle of a logging road at 18:47, presumably resting.

While our goal was to sufficiently sample both the canyon interior and the surrounding logged forest areas, it is interesting to note that while felids were detected in both primary and logged forest sites, they were recorded at relatively few localities. Together, the Sunda clouded leopard, marbled cat and leopard cat were detected in three general areas: (1) the primary forest in the southern slopes ( $n = 10$  photographs) inside the Imbak Canyon; (2) logged forest in the northern part ( $n = 3$ ) outside of the canyon; and (3) logged forest in the middle-western

part ( $n = 2$ ) outside the canyon (see Fig. 1). Although combined these represent too few detections to make meaningful inferences, this pattern isn't contrary to observations made by Davies & Payne (1982) that felids in Sabah are generally patchily distributed in both primary and logged forest. As have been shown elsewhere in Sabah and other parts of Borneo (Gordon & Stewart 2007, Mohamed et al. 2009, Bernard et al. 2012), both forest types may therefore be valuable to cat conservation efforts in the Imbak Canyon area.

We have provided some general information on three of five Bornean felids in the ICCA, all of which are cryptic and two of which, the 'Vulnerable' Sunda clouded leopard and marbled cat, are of conservation concern. The primary forest habitat of the ICCA has already been gazetted as fully protected. However as shown in the present study, the areas surrounding the ICCA, despite having been subjected to logging, could also be important habitats for wild felids. We hope that by highlighting the importance of logged forests surrounding the Imbak Canyon for these cat species, such areas will also merit consideration by appropriate authorities to be afforded some level of protection—such as a declared buffer zone—in order to provide an added measure of protection to the ICCA.

#### Acknowledgements

The wildlife survey in and around the Imbak Canyon Conservation Area was organized by the Sabah Wildlife Department and Yayasan Sabah and participated by > 100 personnel from nine other institutions from Sabah and Sarawak: Sabah Parks, Sabah Museum, WWF-Malaysia, Sabah Biodiversity Centre, Borneo Conservation Trust, Universiti Malaysia Sabah (UMS), Universiti Malaysia Sarawak and Sarawak Forestry Corporation. Major funding for the wildlife survey was provided by PETRONAS, with additional funding from UMS. HB was partially funded by Pro Natura Foundation Japan 2012, to take part in the wildlife survey. Arney Sapaat provided assistance with the preparation of the felid distribution map. We thank two anonymous reviewers who gave valuable comments on earlier drafts of this report.

#### References

Azlan M.J. & Sanderson J. 2007. Geographic distribution and conservation status of the bay cat *Catopuma badia*, a Bornean endemic. *Oryx* 41, 394-397.



Fig. 2. Sunda clouded leopard.



Fig. 3. Marbled cat.



Fig. 4. Leopard cat.

- Bernard H., Baking E. L., Matsubayashi H. & Ahmad A.H. 2012. Records of Bornean felids in and around Tabin Wildlife Reserve, Sabah, Malaysia. *Cat News* 56, 4-7.
- Brodie J. & Giordano A. J. 2012. New high elevation of the bay cat from Malaysian Borneo. *Cat News* 56, 8.
- Cheyne S. M., Morrogh-Bernard H. & Macdonald D. W. 2009. First flat-headed cat photographed in Sebangau Catchment, Indonesian Borneo. *Cat News* 51, 18.
- Davies G. & Payne J. 1982. A Faunal Survey of Sabah. WWF Malaysia for the Game Branch, Forestry Department, Sabah.
- Gordon C. H. & Stewart A. M. E. 2007. The use of logging road by clouded leopards. *Cat News* 47, 12-13.
- IUCN. 2012. The IUCN Red List of Threatened Species. Version 2012.2 <<http://www.iucn-redlist.org>>. Downloaded on 25 January 2013.
- Latif A. & Sinun W. (Eds). 2012. Imbak Canyon Conservation Area, Sabah: Geology, Biodiversity and Socio-economic Environment. Academy of Sciences Malaysia and Yayasan Sabah.
- Mohamed A., Samejima H. & Wilting A. 2009. Records of five Bornean cat species from Deramakot Forest Reserve in Sabah, Malaysia. *Cat News* 51, 12-15.
- Ross J., Hearn A. J., Bernard H., Secoy K. & Macdonald D. 2010. A Framework for a Wild Cat Action Plan for Sabah. Global Canopy Programme, Oxford, U.K.
- Yasuda M., Matsubayashi H., Rustam, Numata S., Rafiah J.A.S. & Abu Bakar S. 2007. Recent cat records by camera traps in Peninsular Malaysia and Borneo. *Cat News* 47, 12-14.
- <sup>1</sup> Institute for Tropical Biology & Conservation, Universiti Malaysia Sabah, Jalan UMS, 88400 Kota Kinabalu, Sabah, Malaysia  
\*[hbtiandun@gmail.com](mailto:hbtiandun@gmail.com)
- <sup>2</sup> Department of Zoology and Botany, Biodiversity Research Centre, University of British Columbia, Vancouver, British Columbia, Canada
- <sup>3</sup> S.P.E.C.I.E.S., LifeScape International, New York, NY, USA.
- <sup>4</sup> Department of Natural Resources Management, Texas Tech University, Lubbock, Texas, USA.
- <sup>5</sup> Yayasan Sabah, Level 12, Menara Tun Mustapha, 88817 Kota Kinabalu, Sabah Malaysia
- Supporting Online Material SOM Table 1 is available at [www.catsg.org/catnews](http://www.catsg.org/catnews).

**Bernard et al. 2013. Bornean felids in and around the Imbak Canyon Conservation Area, Sabah, Malaysia. Cat News 58, 44-46.**

**Supporting Online Material Table 1.** Details of the Bornean felids photo-captured in and around the Imbak Canyon Conservation Area in central Sabah, Malaysian Borneo.

Species	Habitat	Date dd/mm/yy	Time	GPS coordinate	Elevation (meter asl)
<i>Neofelis diardi</i>	Primary forest	03/09/2012	20h43	N 05° 02.070' E 117° 02.511'	489
	Primary forest	23/07/2012	07h54	N 05° 00.657' E 117° 03.100'	605
	Primary forest	25/07/2012	06h19	N 05° 01.126' E 117° 03.070'	504
	Primary forest	02/08/2012	02h17	N 05° 01.126' E 117° 03.070'	504
	Primary forest	12/08/2012	21h18	N 05° 01.126' E 117° 03.070'	504
	Primary forest	28/08/2012	01h19	N 05° 01.126' E 117° 03.070'	504
	Primary forest	01/08/2012	01h47	N 05° 01.011' E 117° 02.161'	559
	Primary forest	23/07/2012	05h48	N 05° 01.011' E 117° 02.161'	559
	Logged forest	18/07/2012	23h35	N 05° 11.088' E 116° 57.715'	210
	Logged forest	12/07/2012	22h21	N 05° 03.433' E 116° 56.768'	152
	Logged forest	13/07/2012	18h47	N 05° 03.458' E 116° 57.557'	152
<i>Pardofelis marmorata</i>	Primary forest	13/08/2012	06h20	N 05° 02.070' E 117° 02.511'	489
	Logged forest	15/07/2012	05h52	N 05° 11.850' E 116° 57.720'	159
<i>Prionailurus bengalensis</i>	Primary forest	24/08/2012	01h06	N 05° 01.011' E 117° 02.161'	559
	Logged forest	14/07/2012	01h38	-	179