



Life from Headwaters to the Coast

SAMUNSAM

Wilderness Rediscovered

Edited by

Jayasilan Mohd-Azlan,
Abang Arabi Abang Aimran and Indraneil Das



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FOREWORD

Malaysia's largest State, Sarawak, on the island of Borneo, is home to some of the world's richest biodiversity, including endemics, economically valuable species, as well as species of conservation importance. Some of the best examples of such plants and animals can be found in Sarawak's extensive network of protected areas. Many of us here in Universiti Malaysia Sarawak continue to explore Sarawak's biodiversity, with the hopes of generating critical knowledge at these sites. This book represents but a subset of work done by our academics in the realm of biodiversity research. I would like to commend the efforts by Sarawak Forestry Corporation Sdn. Bhd. who supported us in this task, by providing a research grant. The work is expected to be important for local communities, to aid them better understand, appreciate and perhaps use their resources sustainably, such as an interpretation tool to guide ecotourists and naturalists in Samunsam.



As will be evident to the readership, a variety of approaches have been taken by the authors of this volume. J. Mohd-Azlan, Lisa Lok and Indraneil Das provide the backdrop to the project, including introductory information on Samunsam. Siali and Tisen from SFC provides a brief account of the development of the site as a Wildlife Sanctuary. Subsequent chapters deal with the zoological components of the Sanctuary's biodiversity, including crabs (Jongkar Grinang), termites (Wan Nurainie Wan Ismail and colleagues), dragonflies and damselflies (Rory Dow), fishes (Fazimah Aziz and colleagues), amphibians and reptiles (Indraneil Das and his team), a separate chapter on the Painted Terrapin (James Bali), investigations on the bird diversity (Mohamad Fizl Sidq Ramji and colleagues); small mammal community (Faisal Ali and colleagues); a separate chapter focussed on the Proboscis Monkey (Ahmad Fitri Aziz and colleagues) and the larger mammals (Mohd-Azlan Jayasilan and his team). The book wraps up with chapters on related social elements, such as use of natural resources (Mohamad Suhaidi and his team), and finally, the ecotourism and entrepreneurial potential of Samunsam (Dayang Affizah).

It is my hope that this book will contribute in at least a small way of encouraging more people to work in the field, publish more articles of this

FOREWORD

kind and new sponsors would emerge to provide support. I anticipate that this volume will be useful to stakeholders to whom we remain connected through our common views on biodiversity conservation for future generations.

Prof. Datuk Dr. Mohamad Kadim Suaidi
Vice Chancellor
Universiti Malaysia Sarawak



MESSAGE

The State of Sarawak boasts one of the most extensive networks of protected areas in Malaysia. The western tip of Sarawak is an important area for biodiversity conservation where iconic protected areas, such as Tanjung Datu National Park and Samunsam Wildlife Sanctuary are located.

Biodiversity is one of the top State agendas, whereby the State of Sarawak, with the establishment of Sarawak Forestry Corporation (Park and Wildlife) is determined to conserve and protect its wildlife and natural landscapes. This project sits in line with the University's niche area of biodiversity and environmental conservation and sustainable community transformation. This book, based on research collections by the staff of our two institutes, brings together information on species, their habitats and other aspects of natural history, and the perceptions of the human community on conservation and sustainable use.

Identifying the distribution, densities and habitat use of animals in tropical rainforest are essential for understanding their ecology, and in facilitating management of our biodiversity-rich protected areas. This book attempts to enumerate these species, many of which remain undetected in the dense tropical rainforest. The faunal studies include inventories of crabs, termites, dragonflies and damselflies, fishes, frogs, reptiles, birds and mammals of the area, a critical first step towards understanding our natural heritage. The work also highlights how the local communities interact with biodiversity, and their deep dependence with such natural resources in Samunsam.

This book is written for local stakeholders, management authorities, naturalists, researchers and for the general public. An understanding of our biodiversity may influence the support of the complex needs of conservation in this ever-challenging environment. It is hoped that nature enthusiasts and those who are interested in tropical biodiversity will find this book beneficial.



MESSAGE

Acknowledgement is here made to the authors who have gathered these data, substantially increasing our knowledge and awareness of an important part of our national heritage.

Prof. Dr. Wan Hashim Wan Ibrahim
Deputy Vice Chancellor (Research & Innovation)
Universiti Malaysia Sarawak

Mr. Oswald Braken Tisen
Deputy CEO
Sarawak Forestry Corporation (Park and Wildlife)



PREFACE

The Expedition to Samunsam Wildlife Sanctuary, located near the western tip of Sarawak State, approximately 100 km from Kuching city, was held over the years 2019–2020. It was undertaken by the staff and students of Universiti Malaysia Sarawak, in collaboration with the Sarawak Forestry Corporation, the latter agency providing funding and on-the-ground support, besides joining forces in some of the field data collection.

The diversity of forest types (necessitating different sampling protocols) and eventually, the arrival of the Covid-19 pandemic, were major challenges on the ground, leading to reduced resources available for sampling. Despite these shortcomings, the multidisciplinary team from our two agencies could satisfactorily conduct what is essentially a rapid biodiversity survey, and bring the results out for our stakeholders in time.

Promotion of protected areas as tourist attraction and for research activities has been high on the State's agenda, being seen as an important driver of socioeconomic growth. It can also help governmental agencies such as ours remain engaged with the public for conservation, network with researchers locally and globally and incorporate new knowledge into conservation management plans.

The project was funded by Sarawak Forestry Corporation (GL/F07/SAMUNSAM/2019). We are especially thankful to Paschal Dagang and Taha Wahap for their assistance in the project. We also extend our gratitude to the staff of Samunsam Wildlife Sanctuary, namely, Mohamad Khalid B. Mohamad Zakeria, Mr. Japri and Mr. Shukur for their help. We would also like to thank Research, Innovation and Enterprise Centre, the Faculty of Social Sciences, the Faculty of Economics and Business, the Institute of Biodiversity and Environmental Conservation and the Faculty of Resource Science and Technology, UNIMAS for logistical and administrative support.

The following colleagues helped with reviews of manuscripts: Aaron M. Bauer, Henry Bernard, Kelvin Egay, Melvin Gumal, Jason Hon, David T. Jones, Kelvin K.P. Lim, Lo May Chiun, Suhaili bin Mokhtar, Peter K.L. Ng, Andrew Alek Tuen, Chan Kin Onn, Albert Orr, Pang Sing Tyan, Mustapha Abdul Rahman, Tan Heok Hui and Darren Yeo. We owe a special debt of gratitude to our friends and colleagues, Chien C. Lee, Research Associates of the Institute of Biodiversity and Environmental Conservation, UNIMAS, for providing images of species that we have used in this work.

PREFACE

Finally, we thank Chan Hin Ching for designing the page layout and Datuk Chan Chew Lun, Natural History Publications (Borneo) Sdn Bhd, and Sarawak Forestry Corporation and UNIMAS Publisher for arranging its publication.

If this guide contributes to the enhancement of knowledge and compel readers to think anew about conservation of this important protected area, and inspire local stakeholders to take pride in their biodiversity, we would consider the project a success.

*Jayasilan Mohd-Azlan
Abang Arabi Abang Aimran
Indraneil Das*



LARGE MAMMALS

*Jayasilan Mohd Azlan, Sally Soo Kaicheen, Tan Dick Shen,
Nurfazlin Shahira binti Mohd Fauzi, Marius Joscha Maiwald,
Ahmad Fitri Aziz, Paschal Dagang, Trevor Allen Nyaseng
and Lisa Lok Choy Hong*

Wildlife Sanctuaries are primarily established to protect rare and endangered species in Sarawak. Access into Wildlife Sanctuaries is restricted to prevent human activities that may potentially disturb and damage the local flora and fauna. Gazetted in 1979, Samunsam Wildlife Sanctuary (SWS) is the oldest Wildlife Sanctuary in the State. The Sanctuary was established with the goal of conserving the Proboscis Monkey and serve as an Important Bird Area in Sarawak.

Situated in the Lundu Division, SWS spans a total area of 22,798 ha and consists of four distinct forest types- mangrove forest, riverine forest, tropical heath forest and mixed dipterocarp forest (Hazebroek & Abang, 2000). The area is drained by the Samunsam River, located in the middle of the Sanctuary. Previously, the Sanctuary was only accessible via a two-hour boat journey from the jetty in Sematan. With the completion of the first phase of Sarawak Pan Borneo Highway (Telok Melano-Semantan) in January 2019, the site now has road access. However, the new highway has partially split the Sanctuary and created fragmented forest patches to the north-east.

Mammals are amongst the most threatened taxa caused by habitat loss and fragmentation (Dirzo *et al.*, 2004), and have been considered reliable indicators of ecosystem quality, and therefore, utilized for many monitoring and assessment programmes worldwide (Caro, 2010; Ahumuda *et al.*, 2011). The current study was conducted to document the large mammals present in Samunsam Wildlife Sanctuary.

A total of 26 passive infra-red camera traps (Bushnell Trophy Cam) were installed at sites across SWS. Cameras were placed in different habitat types including mixed dipterocarp, tropical heath, riverine, Nipah and mangrove forests. The survey amounted to a total of 1,255 trap nights and yielded 1,062 independent photographs, and recorded sixteen species from nine families (see Checklist). Mammals of high conservation status, such as the Proboscis Monkey (*Nasalis larvatus*) and Otter Civet (*Cynogale bennettii*), which are classified as 'Endangered' and the Bearded Pig and the Pig-tailed Macaque, listed as 'Vulnerable' by the IUCN Red List (IUCN, 2020) were recorded.

LARGE MAMMALS

Only one species is listed as ‘Totally Protected’ and nine as ‘Protected’ under the Sarawak Wild Life Protection Ordinance 1998. The most frequent photographed were Mousedeer, Bearded Pig and Pig-tailed Macaque. Large herbivorous mammals, such as the Sambar Deer and Barking Deer were not recorded during the camera trap survey.

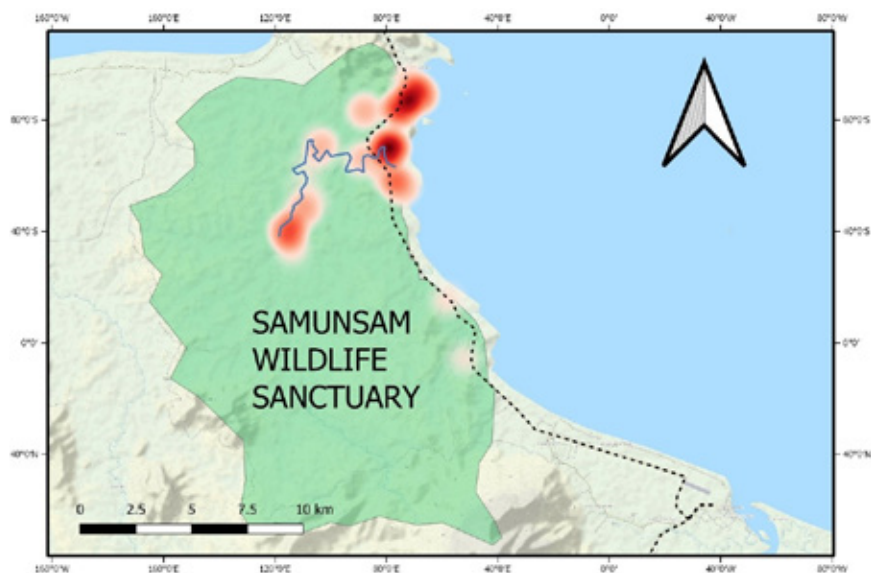


Fig. 1. Species were concentrated towards the north-eastern tip of Samunsam Wildlife Sanctuary and the remote parts of the Samunsam River.

The species distribution (Fig. 1) highlights that the large mammals are concentrated in areas further Samunsam river upriver and towards the north-eastern boundary of SWS. Low species richness was recorded along the south-eastern part of the SWS extension, especially near the fragmented forested areas that are separated by the road. Fourteen species of large mammals were recorded in the mixed dipterocarp forest. The Pig-tailed Macaque, Mousedeer and Bearded Pig which are considered to be generalist species were recorded from various types of forests. The Proboscis Monkey, Banded Palm Civet, Yellow-throated Marten, Masked Palm Civet and Linsang were only recorded from the mixed dipterocarp forest. The Otter Civet was only recorded from the riverine forest.

In a previous camera trap study employing camera traps (Mohd-Azlan *et al.*, unpublished, 2014), 14 species were recorded from the Sanctuary. Compared to the previous study, the current one recorded four additional

LARGE MAMMALS

Checklist of Large Mammals

List of large mammals at Samunsam Wildlife Sanctuary and their conservation status. Abbreviations: WLPO 1998 = Wild Life Protection Ordinance 1998, IUCN = The IUCN Red List of Threatened Species, CITES = Convention on International Trade in Endangered Species of Wild Fauna and Flora, TP = Totally Protected Species, P = Protected Species, N/A = Not Available, I = Listed under CITES Appendices I and II = Listed under CITES Appendices II and III = Species listed under CITES Appendix III, LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered.

Order/Family	Scientific Name	Common Name	Conservation Status		
			WLPO 1998	IUCN	CITES
Artiodactyla					
Tragulidae	<i>Tragulus</i> sp.	Mosedeer	N/A	LC	N/A
Suidae	<i>Sus barbatus</i>	Bearded Pig	N/A	VU	N/A
Carnivora					
Herpestidae	<i>Herpestes brachyurus</i>	Short-tailed Mongoose	P	NT	N/A
Mustelidae	<i>Martes flavigula</i>	Yellow-throated Marten	N/A	LC	III
Viverridae	<i>Paradoxurus hermaphroditus</i>	Common Palm Civet	N/A	LC	III
	<i>Hemigalus derbyanus</i>	Banded Palm Civet	P	NT	II
	<i>Viverra tangalunga</i>	Malay Civet	P	LC	N/A
	<i>Paguma larvata</i>	Masked Palm Civet	P	LC	III
	<i>Cynogale bennettii</i>	Otter Civet	P	EN	II
Prionodontidae	<i>Prionodon linsang</i>	Banded Linsang	N/A	LC	N/A
Primates					
Cercopithecidae	<i>Macaca nemestrina</i>	Pig-tailed Macaque	P	VU	II
	<i>Macaca fascicularis</i>	Long-tailed Macaque	P	LC	II
	<i>Nasalis larvatus</i>	Proboscis Monkey	TP	EN	I

LARGE MAMMALS

Order/Family	Scientific Name	Common Name	Conservation Status		
			WLPO 1998	IUCN	CITES
Eulipotyphla					
Erinaceidae	<i>Echinosorex gymnura</i>	Moonrat	N/A	LC	N/A
Rodentia					
Hystiricidae	<i>Hystrix brachyura</i>	Malayan Porcupine	P	LC	N/A
	<i>Trichys fasciculata</i>	Long-tailed Porcupine	P	LC	N/A

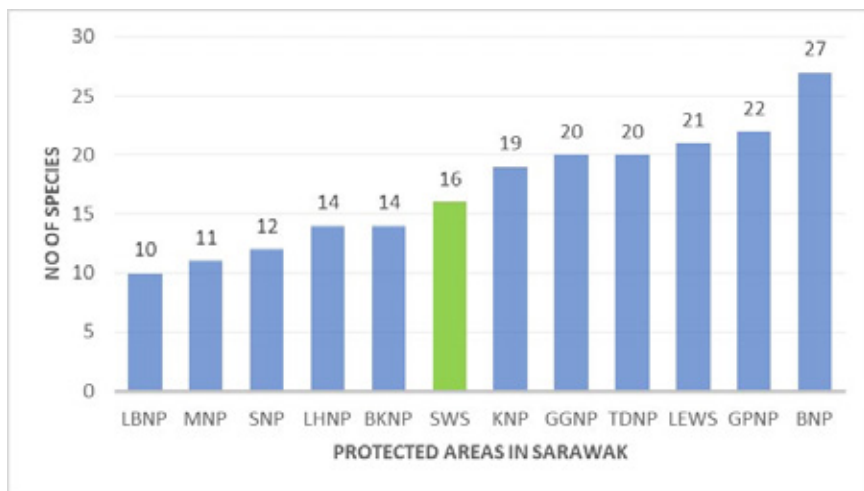


Fig. 2. Comparative species richness figures of large terrestrial mammals recorded using camera-trapping in Totally Protected Areas in Sarawak. Abbreviations and effort (camera trap nights): LBNP–Loagan Bunut National Park (510) (Mohd-Azlan *et al.*, 2006), MNP–Maludam National Park (667) (Mohd-Azlan, 2004), SNP–Santubong National Park (6269) (Kaicheen, 2009), LHNP–Lambir Hills National Park (1127) (Mohd-Azlan & Lading, 2006), BKNP–Bako National Park (3685) (Kaicheen, 2019), SWS–Samunsam Wildlife Sanctuary (1225), KNP–Kubah National Park (2161) (Mohd-Azlan *et al.*, 2018), GGNP–Gunung Gading National Park (3579) (Kaicheen, 2019), TDNP–Tanjung Datu National Park (2490), LEWS–Lanjak Entimau Wildlife Sanctuary (1945), GPNP–Gunung Pueh National Park (3132) (Kaicheen, 2019), BNP–Baleh National Park (1678) (Mohd-Azlan *et al.*, 2019).

species: Long-tailed Porcupine, Masked Palm Civet, Banded Linsang and Otter Civet that were not recorded in the previous study. Species such as the Binturong, Sambar Deer, Barking Deer and the Sunda Pangolin were recorded in the previous study, but were absent from the current list. Alternatively, the Sambar Deer and Sunda Pangolin may occur in lower densities, that may have reduced detection probability. Taking historical and current observation into account, the landscape in SWS appears to support lower species richness compared to other protected areas in Sarawak.

The species richness of large mammals in SWS appears relatively low compared with other protected areas in the district of Lundu, such as the Gunung Pueh National Park and Gunung Gading National Park, which

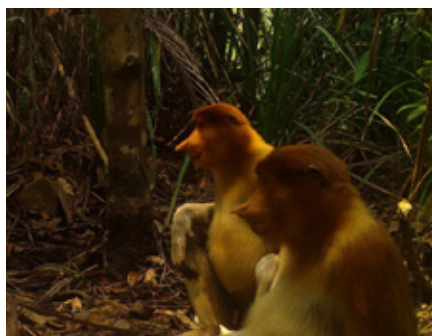


Fig. 3. Two female Proboscis Monkey from near Samunsam River. This species was opportunistically recorded on the ground in mixed dipterocarp forests.



Fig. 4. Bearded Pig (*Sus barbatus*) was frequently recorded from mixed dipterocarp forests. This species appears to be relatively common in SWS.

are four times smaller than SWS but recorded 22 and 20 species, respectively. Nevertheless, SWS, which is composed of several habitat types, recorded relatively higher species richness compared to Maludam National Park, which is a peat swamp forest (Fig. 2). The relatively lower species richness in the mangrove and peat swamp forests compared to the mixed dipterocarp forest may be due to forest structure change to due to the simpler forest structure, with a relatively low plant diversity. Habitats with higher complexity tend to sustain a higher concentration of species richness, where the structures of littoral and alluvial forests are significantly less complex compared to the mixed dipterocarp forests, therefore supporting lower species numbers (Mohd-Azlan and Lawes, 2011; Dalling *et al.*, 2016). Yet, the simplicity of these forest types arouses the interest of researchers to find associations between species diversity and the ecosystem (Ashton *et al.*, 2003).



Fig. 5. Common Palm Civet (*Paradoxurus hemaphroditus*) was recorded near Samunsam River. This species was mostly recorded from MDF forest and appears uncommon in swamp forests.



Fig. 6. Malay Civet (*Viverra zangalla*) was recorded near Samunsam River. This largely terrestrial small carnivore appears to be a generalist.



Fig. 7. Malayan Porcupine (*Hystrix brachyura*) recorded nearby Samunsam River. This species is mainly nocturnal.

The absence of the Flat-headed Cat (*Prionailurus planiceps*) in the current checklist for SWS warrants further exploration, as Samunsam Wildlife Sanctuary is listed as a potential site for investigation with the occurrence of this species due to its association with wetlands (Medway 1983; Wilting *et al.*, 2012; Wilting *et al.*, 2016).

Most generalist species (i.e., Pig-tailed Macaque, Long-tailed Macaque, Malayan Porcupine, Malay Civet, Collared Mongoose, Common Palm Civet, Bearded Pig, Long-tailed Porcupine and Mousedeer) were recorded from over two habitat types, while some species are only detected in a single habitat (i.e., Proboscis Monkey, Otter Civet, Yellow-throated Marten, Masked Palm Civet, Banded Linsang and Moonrat). The Banded Palm Civet, Banded Linsang, Yellow-throated Marten and Masked Palm Civet are uncommon in peat swamp forests, but frequently recorded from mixed dipterocarp forests, as reported by Phillipps and Phillipps (2018). On the other hand, the Proboscis Monkey was recorded in dipterocarp forests opportunistically, presumably while traveling on the ground, therefore may not be indicative of its habitat preference but suggestive that this species is also dependent on such forest types.

SWS provides a range of habitats with continuous forest that extend into Gunung Pueh National

LARGE MAMMALS



Fig. 8. The Long-tailed Macaque, protected in Sarawak under the Sarawak Wild Life Protection Ordinance, 1998, is often seen along Samunsam River.



Fig. 9. The Yellow-throated Marten, an omnivore, is mainly diurnal and semi-arboreal.



Fig. 9. The Bearded Pig is an omnivore, known to forage on fallen fruits, roots and invertebrates.

Park, which is critically important to support the long-term persistence of many threatened, sensitive species that are of conservation importance. Therefore, the ecological integrity of the forest needs to be preserved in order to support and maintain ecological processes and the diverse mammalian community.

This project was funded by the Sarawak Forestry Corporation (GL/F07/SAMUNSAM/2019). We are especially thankful to Taha Wahab for his assistance in the project, and also extend our gratitude to the staff of Samunsam Wildlife Sanctuary, namely, Khalid Mohamad Zakeria, Mr. Japri and Mr. Shukor for their help. We would also like to thank RIEC, IBEC and the Faculty of Resource Science and Technology, UNIMAS for logistical and administrative support.

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Proboscis Monkeys foraging along Sungei Samunsam is a familiar sight during dawn and at dusk.
Photo: Zahran Mansor.