

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

*Cambridge Studies in Biological and Evolutionary Anthropology* 60

Monkeys on the Edge: Ecology and Management of Long-Tailed  
Macaques and their Interface with Humans

Long-tailed macaques (*Macaca fascicularis*) have a wide geographical distribution and extensively overlap with human societies across Southeast Asia, regularly utilizing the edges of secondary forest and inhabiting numerous anthropogenic environments, including temple grounds, cities, and farmlands. Yet despite their apparent ubiquity across the region, there are striking gaps in our understanding of long-tailed macaque population ecology.

This timely volume, a key resource for primatologists, anthropologists, and conservationists, underlines the urgent need for comprehensive population studies on common macaques. Providing the first detailed look at research on this underexplored species, it unveils what is currently known about the population of *M. fascicularis*, explores the contexts and consequences of human-macaque sympatry, and discusses the innovative programs being initiated to resolve human-macaque conflict across Asia. Spread throughout the book are boxed case studies that supplement the chapters and give a valuable insight into specific field studies on wild *M. fascicularis* populations.

MICHAEL D. GUMERT is an Assistant Professor in the Division of Psychology at Nanyang Technological University, Singapore, where he leads a field program investigating the behavioral biology and ecology of *Macaca fascicularis* in Indonesia, Singapore, and Thailand. Recent research focuses on practical issues facing long-tailed macaque populations and he has organized international experts in a cooperative group to better understand the conservation and management needs of long-tailed macaques.

AGUSTÍN FUENTES is Professor of Anthropology and Director of the Institute for Scholarship in the Liberal Arts at the University of Notre Dame. His current research projects include assessing behavior, ecology, and pathogen transmission in human-monkey interactions in Southeast Asia and Gibraltar and examining the roles of cooperation, social negotiation, and niche construction in primate and human evolution.

LISA JONES-ENGEL is a Senior Research Scientist at the Washington National Primate Research Center, University of Washington. Her current research focuses on the human-primate interface where she coordinates several multidisciplinary research projects in Asia, which focus on the role synanthropic macaques play in the evolution and emergence of infectious diseases.

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

*Cambridge Studies in Biological and Evolutionary Anthropology*

*Series Editors*

HUMAN ECOLOGY

C. G. Nicholas Mascie-Taylor, University of Cambridge

Michael A. Little, State University of New York, Binghamton

GENETICS

Kenneth M. Weiss, Pennsylvania State University

HUMAN EVOLUTION

Robert A. Foley, University of Cambridge

Nina G. Jablonski, California Academy of Science

PRIMATOLOGY

Karen B. Strier, University of Wisconsin, Madison

*Also available in the series*

43 *Bioarchaeology of Southeast Asia* Marc Oxenham & Nancy Tayles (eds.)

0 521 82580 6

44 *Seasonality in Primates* Diane K. Brockman & Carel P. van Schaik 0 521 82069 3

45 *Human Biology of Afro-Caribbean Populations* Lorena Madrigal 0 521 81931 8

46 *Primate and Human Evolution* Susan Cachel 0 521 82942 9

47 *The First Boat People* Steve Webb 0 521 85656 6

48 *Feeding Ecology in Apes and Other Primates* Gottfried Hohmann, Martha Robbins & Christophe Boesch (eds.) 0 521 85837 2

49 *Measuring Stress in Humans: A Practical Guide for the Field* Gillian Ice & Gary James (eds.) 0 521 84479 7

50 *The Bioarchaeology of Children: Perspectives from Biological and Forensic Anthropology* Mary Lewis 0 521 83602 6

51 *Monkeys of the Tai Forest* W. Scott McGraw, Klaus Zuberbühler & Ronald Noe (eds.) 0 521 81633 5

52 *Health Change in the Asia-Pacific Region: Biocultural and Epidemiological Approaches* Ryutaro Ohtsuka & Stanley I. Ulijaszek (eds.) 978 0 521 83792 7

53 *Technique and Application in Dental Anthropology* Joel D. Irish & Greg C. Nelson (eds.) 978 0 521 870 610

54 *Western Diseases: An Evolutionary Perspective* Tessa M. Pollard 978 0 521 61737 6

55 *Spider Monkeys: The Biology, Behavior and Ecology of the genus Ateles* Christina J. Campbell 978 0 521 86750 4

56 *Between Biology and Culture* Holger Schutkowski (ed.) 978 0 521 85936 3

57 *Primate Parasite Ecology: The Dynamics and Study of Host-Parasite Relationships* Michael A. Huffman & Colin A. Chapman (eds.) 978 0 521 87246 1

58 *The Evolutionary Biology of Human Body Fatness: Thrift and Control* Jonathan C. K. Wells 978 0 521 88420 4

59 *Reproduction and Adaptation: Topics in Human Reproductive Ecology*

C. G. Nicholas Mascie-Taylor & Lyliane Rosetta 978 0 521 50963 3

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed  
Macques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

---

# Monkeys on the Edge

*Ecology and Management of Long-Tailed  
Macques and their Interface with Humans*

*Edited by*

MICHAEL D. GUMERT

*Nanyang Technological University, Singapore*

AGUSTÍN FUENTES

*University of Notre Dame, Indiana, USA*

LISA JONES-ENGEL

*Washington National Primate Research Center, Seattle, USA*



CAMBRIDGE  
UNIVERSITY PRESS

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

CAMBRIDGE UNIVERSITY PRESS

Cambridge, New York, Melbourne, Madrid, Cape Town,  
Singapore, São Paulo, Delhi, Tokyo, Mexico City

Cambridge University Press

The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

[www.cambridge.org](http://www.cambridge.org)

Information on this title: [www.cambridge.org/9780521764339](http://www.cambridge.org/9780521764339)

© Cambridge University Press 2011

This publication is in copyright. Subject to statutory exception  
and to the provisions of relevant collective licensing agreements,  
no reproduction of any part may take place without the written  
permission of Cambridge University Press.

First published 2011

Printed in the United Kingdom at the University Press, Cambridge

*A catalogue record for this publication is available from the British Library*

*Library of Congress Cataloguing in Publication data*

Monkeys on the edge : ecology and management of long-tailed macaques and their interface with  
humans / [edited by] Michael D. Gumert, Agustín Fuentes, Lisa Jones-Engel.

p. cm. – (Cambridge studies in biological and evolutionary anthropology)

Includes bibliographical references and index.

ISBN 978-0-521-76433-9 (hardback)

1. Kra–Ecology. 2. Kra–Conservation. 3. Kra–Effect of human beings on.

I. Fuentes, Agustin. II. Gumert, Michael D. III. Jones-Engel, Lisa.

IV. Title. V. Series.

QL737.P93M657 2011

599.8'644–dc22

2010054305

ISBN 978-0-521-76433-9 Hardback

Cambridge University Press has no responsibility for the persistence or  
accuracy of URLs for external or third-party internet websites referred to in  
this publication, and does not guarantee that any content on such websites is,  
or will remain, accurate or appropriate.

Cambridge University Press  
978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed  
Macques and their Interface with Humans  
Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel  
Frontmatter  
[More information](#)

Contents

<i>List of contributors</i>	page viii
<i>Foreword</i>	xi
DAVID QUAMMEN	
<i>Preface</i>	xiii
<i>Acknowledgements</i>	xvii
<b>Part I The status and distribution of long-tailed macaques</b>	<b>1</b>
1 The common monkey of Southeast Asia: Long-tailed macaque populations, ethnophoresy, and their occurrence in human environments	3
MICHAEL D. GUMERT	
<b>Box 1.1:</b> The long-tailed macaques of Karimunjawa ( <i>Macaca fascicularis karimondjiwae</i> ): A small and isolated island subspecies threatened by human–macaque conflict	12
NUR AFENDI, DEVIS RACHMAWAN AND MICHAEL D. GUMERT	
<b>Box 1.2:</b> Trade in long-tailed macaques ( <i>Macaca fascicularis</i> )	20
KAITLYN-ELIZABETH FOLEY AND CHRIS R. SHEPHERD	
2 Distribution and current status of long-tailed macaques ( <i>Macaca fascicularis aurea</i> ) in Myanmar	45
AYE MI SAN AND YUZURU HAMADA	
<b>Box 2.1:</b> Preliminary survey of the long-tailed macaques ( <i>Macaca fascicularis</i> ) on Java, Indonesia: Distribution and human–primate conflict	65
RANDALL C. KYES, ENTANG ISKANDAR AND JOKO PAMUNGKAS	
3 Distribution and present status of long-tailed macaques ( <i>Macaca fascicularis</i> ) in Laos and their ecological relationship with rhesus macaques ( <i>Macaca mulatta</i> )	72

[www.cambridge.org](http://www.cambridge.org)

Cambridge University Press  
978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed  
Macques and their Interface with Humans  
Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel  
Frontmatter  
[More information](#)

	<i>Contents</i>	vii
9	The support of conservation programs through the biomedical usage of long-tailed macaques in Mauritius NADA PADAYATCHY	236
10	Ethnophoresy: The exotic macaques on Ngeaur Island, Republic of Palau BRUCE P. WHEATLEY	252
<b>Part IV</b>	<b>Comparisons with rhesus macaques</b>	273
11	India’s rhesus populations: Protectionism versus conservation management CHARLES H. SOUTHWICK AND M. FAROOQ SIDDIQI	275
	<b>Box 11.1:</b> Managing human–macaque conflict in Himachal, India SANDEEP K. RATTAN	283
<b>Part V</b>	<b>Understanding and managing the human–macaque interface</b>	293
12	Developing sustainable human–macaque communities LISA JONES-ENGEL, GREGORY ENGEL, MICHAEL D. GUMERT AND AGUSTÍN FUENTES	295
	<b>Box 12.1:</b> Management of nuisance macaques in Hong Kong CHUNG-TONG SHEK	297
	<b>Box 12.2:</b> Lessons and challenges in the management of long-tailed macaques in urban Singapore BENJAMIN P. Y-H. LEE AND SHARON CHAN	307
13	Future directions for research and conservation of long-tailed macaque populations MICHAEL D. GUMERT, AGUSTÍN FUENTES, GREGORY ENGEL AND LISA JONES-ENGEL	328
	<i>Index</i>	354

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

---

## *Contributors*

Nur Afendi, Karimunjawa National Park Office, Semarang, Java Tengah, Indonesia

I. G. A Arta Purta, Pusat Kajian Primata, Universitas Udayana, Bali, Indonesia

F. Brodcorne, Behavioural Biology Unit, University of Liege, Belgium

Sharon Chan, Central Nature Reserve, Conservation Division National Parks Board, Singapore

Gregory Engel, Washington National Primate Research Center, University of Washington, Seattle, WA, USA

Kaitlyn-Elizabeth Foley, TRAFFIC, Malaysia

Agustín Fuentes, Department of Anthropology University of Notre Dame, Notre Dame, IN, USA

Shunji Goto, Amami Wild-Animal Research Center Kagoshima, Japan

Lisa Guidi, Department of Anthropology, Washington University, St. Louis, MO, USA

Michael D. Gumert, Division of Psychology, School of Humanities and Social, Sciences, Nanyang Technological University, Singapore

Yuzuru Hamada, Evolutionary Morphology Section, Primate Research Institute, Kyoto University, Japan

I. D. K. Harya Putra, Pusat Kajian Primata, Universitas Udayana, Bali, Indonesia

M. C. Huynen, Behavioural Biology Unit, University of Liege, Belgium

Entang Iskandar, Primate Research Center, Bogor Agricultural University, Bogor, West Java, Indonesia

Lisa Jones-Engel, Washington National Primate Research Center, University of Washington, Seattle, WA, USA



Cambridge University Press

978-0-521-76433-9 - *Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans*

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

*List of contributors* ix

Phouthone Kingsada, Department of Biology, National University of Laos, Dong Dok, Vientiane, Lao People's Democratic Republic

Hiroyuki Kurita, Board of Education, Oita City, Japan

Randall C. Kyes, Washington National Primate Research Center, University of Washington, Seattle, WA, USA

Benjamin P. Y-H. Lee, Nature Parks Branch, Parks Division, National Parks Board, Republic of Singapore; formerly Durrell Institute of Conservation and Ecology, University of Kent, UK

Suchinda Malaivijitnond, Primate Research Unit Chulalongkorn University, Bangkok, Thailand

Badrul Munir Md-Zain, School of Environmental Science, and Natural Resources, Universiti Kebangsaan Malaysia Bangi, Selangor, Malaysia

Mastura Mohd-Zaki, School of Environmental Science and Natural Resources, Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia

Yoshiki Morimitsu, Institute of Natural and Environmental Sciences, University of Hyogo, Japan

Toru Oi, Ph D., Wildlife Ecology Laboratory Forestry and Forest Products Research Institute, Ibaraki, Japan

Nada Padayatchy, Bioculture Ltd., Mauritius

Joko Pamungkas, Primate Research Center, Bogor Agricultural University, Bogor, West Java, Indonesia

Sitideth Pathonton, Department of Biology, National University of Laos, Dong Dok, Vientiane, Lao People's Democratic Republic

Bounnam Pathontone, Department of Biology, National University of Laos, Dong Dok, Vientiane, Lao People's Democratic Republic

Bounthob Praxaysombath, Department of Biology, National University of Laos, Dong Dok, Vientiane, Lao People's Democratic, Republic

Devis Rachmawan, Orangutan Foundation-UK, Pangkalan Bun, Kalimantan Tengah Indonesia

Sandeep K. Rattan, Wildlife Wing, HP Forest Department, Himachal Pradesh, India

Aida L. T. Rompis, Pusat Kajian Primata, Universitas Udayana, Bali, Indonesia

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

x *List of contributors*

Fong Samouth, Department of Ecology, National University of Laos, Dong Dok, Vientiane, Lao People's Democratic Republic

Aye Mi San, Department of Zoology, University of Yangon, Yangon, Myanmar

Wayan Selamat, Padangtegal Wenara Wana, Bali

Christopher A. Shaffer, Department of Anthropology, Washington University, St. Louis, MO, USA

Chung-Tong Shek, Agriculture, Fisheries and Conservation Department, Hong Kong

Chris R. Shepherd, TRAFFIC, Malaysia

M. Farooq Siddiqi, Aligarh Muslim University, Aligarh, U.P., India

I. G. Soma, Pusat Kajian Primata, Universitas Udayana, Bali, Indonesia

Charles H. Southwick, Department of Ecology and Evolutionary Biology, University of Colorado, Boulder, CO, USA

Rebecca Stephenson, Department of Anthropology, University of Guam, Guam

I. Nyoman Suartha, Pusat Kajian Primata, Universitas Udayana, Bali, Indonesia

Robert W. Sussman, Department of Anthropology, Washington University, St. Louis, MO, USA

Mohamed Reza Tarmizi, School of Environmental Science and Natural Resources, Universiti Kebangsaan Malaysia Bangi, Selangor, Malaysia

Yolanda Vazquez, School of Biology, Faculty of Science, Agriculture and Engineering, Newcastle University, UK

Chanda Vongsombath, Department of Biology, National University of Laos, Dong Dok, Vientiane, Lao People's Democratic Republic

I. Nyoman Wandia, Pusat Kajian Primata, Universitas Udayana, Bali, Indonesia

Ni Luh Watiniasih, Pusat Kajian Primata, Universitas Udayana, Bali, Indonesia

Bruce P. Wheatley, Anthropology Department, University of Alabama, Birmingham, AL, USA

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

## Foreword

### Thirteen ways of looking at a monkey

DAVID QUAMMEN

If the world of nonhuman primates offers an emblem of the tensions of modernity, it's *Macaca fascicularis*, the long-tailed macaque. This alert, adaptable Asian species is one of the world's most familiar monkeys, but also among the most sorely taken for granted. Its behavior is flexible and complex. Its intelligence and opportunism are famous, even notorious. It has been called many names, of which "weed" and "ethnotramp" aren't the worst. Its current population status is poorly known but, by reliable accounts, combines the good news of broad distribution with the bad news of declining numbers. Its relations with *Homo sapiens* are close, diverse, ambivalent, and in some cases problematic. Although it has recently been reclassified as a species of "least concern" by the IUCN, concern does remain high among some primatologists, who see the long-tailed macaque facing multiple challenges throughout its distributional range. Some of those challenges (of which habitat loss, habitat fragmentation, culling and other population-control actions intended to reduce conflict with humans, and capture for use in biomedical research are foremost) could lead to local extinctions, disappearance of subspecies, and compromised population viability overall. No wonder, then, that Michael D. Gumert, Agustín Fuentes, Lisa Jones-Engel, and many of their colleagues have felt an urgent need to assess what is known, and to target what isn't known but should be, about *Macaca fascicularis*. This book is an expression of that heightened concern.

The long-tailed macaque is an extraordinary species, much valued (especially as a laboratory test animal) and at the same time much disdained. It's so plastic in its attributes and roles, so various, so shimmery – and human attitudes toward it are so varied too – that I'm put in mind of the Wallace Stevens poem, "Thirteen Ways of Looking at a Blackbird," first published in 1917, when cubism in art and imagism in poetry were the cresting waves. Stevens was getting at the matter of perspective and subjectivity when he wrote those thirteen little haiku-like bits, each bit a vision or a thought of the bird. For instance: "Among twenty snowy mountains/The only moving thing/Was the eye of the blackbird." And: "I do not know which to prefer/The beauty of inflections/Or the beauty of innuendos,/The blackbird whistling/Or just after." In a similar spirit (but far more prosaically), I've made a list of adjectives that

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)xii      *Foreword*

have been or could be applied to the long-tailed macaque, holding myself to a canonical limit of thirteen. This creature is: smart, adaptive, widespread, resilient, winsome, pestiferous, synanthropic, variable, exploited, sacred, profane, numerous, and besieged. I won't annotate the list because every one of those topics is treated expertly in the chapters that follow.

My own early impression of *Macaca fascicularis* was skewed by the fact that I encountered it first on the island of Mauritius, far from its native range. On Mauritius, to which it was introduced by Portuguese or Dutch sailors sometime in the sixteenth century, it has thrived as one among many exotic species. Those exotics together have caused severe ecological damage, even helped push some Mauritian endemics to extinction; the exact culpability of the long-tailed macaque, amid the jumble of invaders, is hard to measure. Later I saw it in the monkey temples of Bali, manifesting its typical boldness, its special mojo, and I began to appreciate its influential place within human attitudes (especially Hindu, Buddhist, and Animist attitudes) toward nature. Still later, while tagging along on a field trip to Bangladesh with Lisa Jones-Engel and Gregory Engel, during which their focus was the rhesus macaque, *Macaca mulatta*, I learned more about *Macaca fascicularis* also – enough to confute my early bias. It was Jones-Engel who alerted me to the sad and dangerous paradox of the long-tailed macaque in the twenty-first century: that, because so much of its natural habitat is being destroyed, and because it can compensate somewhat by gravitating to the fringes and interstices of human environments, the species is simultaneously becoming more conspicuous and less abundant. Jones-Engel also reminded me that, despite whatever misguided human actions may have placed *Macaca fascicularis* where it doesn't belong, fundamentally it is a wild animal, part of the fullness of life on Earth.

The logical extension of those two fateful trends – more conspicuous, less abundant – is that we might allow ourselves to be surprised when this “common” monkey becomes badly reduced, scarce, even threatened with extinction from parts or all of its range in the wild. We have made that mistake before, with other seemingly plentiful and misprized species – most famously, the passenger pigeon in North America. It would be a shame to commit the same lazy blunder again.

The long-tailed macaque, as this book's title declares, is a species on the edge. It lives on the edges of forests, along the edges of rivers and seas, at the edges of human settlements, and maybe on the edge of catastrophic decline. Wallace Stevens wrote, as the ninth of his thirteen ways: “When the blackbird flew out of sight/It marked the edge/Of one of many circles.” A glimpse of a fleeting arc, and then it was gone.

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

## Preface

A growing concern in Southeast Asian countries is the interface between long-tailed macaques (*Macaca fascicularis*) and human beings (*Homo sapiens*) and the consequences that this sympatric relationship brings to the affected human communities and macaque populations. A variety of potential negative and positive consequences exist in zones of interface for both humans and macaques. As a result, the relationship between *M. fascicularis* and humanity has become a recent focus for academics and NGOs worldwide. In addition, regional governments, whose citizens have expressed concern about the disturbances caused by living closely with macaques, have attempted or are newly initiating programs to manage or reduce populations of macaques living alongside people. The occurrence of human–macaque overlap is not isolated to a few exceptional locations, but rather macaque synanthropy is a widespread phenomenon existing in regions all throughout peninsular and insular Southeast Asia. In this volume, we begin to build a more comprehensive understanding of long-tailed macaque populations and the extent of their overlap with humans.

In several regions of Southeast Asia, governments and NGOs have already initiated management programs to control macaque populations. These programs are a result of an effort to respond to citizen complaints and have set out to reduce what they consider overpopulated and/or nuisance macaque populations. Management programs have occurred or are occurring in Thailand, Malaysia, Hong Kong and Singapore, and to a lesser extent in some regions of Indonesia. The goals of these programs either aim at reducing populations and pushing macaques away from human settlements by whatever means, or are focused on humanely controlling or eradicating the population through means of mass sterilization. Nearly all management programs have been initiated with insufficient or complete lack of information on the population being managed, with action plans often being initiated on only assumptions and non-researched estimates of the size, distribution, density, and other important characteristics of the populations being manipulated. Consequently, there is no way to gauge the impact of these programs on the long-tailed macaque population, and whether the consequences of these programs are indeed pathways to producing the results sought (i.e., reduction of macaque–human conflict).

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)xiv *Preface*

The human–macaque interface is not only occurring with long-tailed macaques, but also has been an issue for rhesus macaques, Assamese macaques, and bonnet macaques in India, Japanese macaques in Japan, Taiwanese macaques in Taiwan, Tibetan macaques in China, several species of macaques in Sulawesi, and to a lesser extent pig-tailed and stump-tailed macaques in several regions of Southeastern Asia. It is a genera-wide dilemma, but we have chosen to focus on long-tailed macaques in this volume because of the large geographic range they encompass and the number of countries affected by this single species. Issues associated with long-tailed macaques interfacing with humans are truly an international environmental dilemma, affecting sixteen different nations and millions of people. This vast overlap between humans and macaques in Southeast Asia is largely driven by the expansive anthropogenic development and habitat modification that is rapidly occurring in the region, as ASEAN nations race to achieve newfound wealth and status amongst the international community. For these reasons, the large influence this single species has over Southeast Asia warrants a detailed look into its population and overlap with people.

In general, it appears that there has been an increase in conflict between humans and macaques over the last decade in Southeast Asia, although it still remains unclear all the factors driving this change. Likely factors include, human expansion into previously undisturbed macaque habitats, an increase of macaques moving near human settlement, increases in populations of macaques and/or humans in regions of interface, increased conflict as the result of communities gaining more wealth and resources to defend from macaques, or just increased reports and complaints by disgruntled citizens becoming more accustomed to modern lifestyles. The uncertainty of the causal factors and their degree of impact on increasing conflict are a clear indication that better investigation is needed on this issue. Understanding the causes of conflict will certainly be of high importance in mitigating it. With current trends in the report of human-macaque conflict, it is anticipated that the development of national and international-level wildlife management organizations dedicated solely to monitoring, evaluating, and implementing action to develop sustainable human-macaque communities and/or reduce conflict between the two will become a major focus of wildlife management in Southeast Asia over the next decade. Management efforts will need to be paralleled by similarly extensive research programs that will help to support and guide these programs so that they do not blindly manipulate their macaque populations.

Long-tailed macaques have had a very long history of living in close proximity to human activity and their settlements, and they are well adapted to reproductively succeed in human-influenced environments. For example, long-tailed macaques tend to prefer forest edge habitats and regions altered

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)*Preface* xv

by human activity hence, they are often found along the edges of human-landscaped environments. They also are generalist feeders and are attracted and adjust well to human-based food resources, such as contained refuse, litter, and food directly given to them. Macaques are also attractive to people, and humans keep them for recreational use (i.e., pets and performance), and this has led to humans manipulating and moving macaques around. This close relationship to humankind, as well as their high level of flexibility and generalist dietary habits, has allowed long-tailed macaques to colonize new island environments after being transported by humans to a few islands beyond their core range in Southeast Asia. The level of impact of these exotic macaques varies from highly invasive to little impact in their new insular environment. Accordingly, the impact of long-tailed macaques is not restricted to only Southeast Asia, and wildlife managers now have to consider efforts to control future introductions of macaques to new islands, as well as managing the impact they have had on the flora and fauna of islands already colonized. Moreover, understanding how long-tailed macaques adjust to such a wide variety of environmental circumstance should be of immense interest to evolutionary scientists interested in the natural selection of variability and flexible behavior.

In this volume, we have attempted to compile what is currently known about the long-tailed macaque population and its overlap with human communities in response to the current needs we have highlighted above. This is a highly needed compilation of information because, although this species is a commonly occurring monkey of Southeast Asia and one of the world's most widely geographically distributed, there is a striking gap in our understanding of its population distribution and abundance. Moreover, this volume will be a useful guide as attention toward this species continues to increase over the coming years. More and more organizations are attempting manipulations of long-tailed macaque populations in an effort to lessen the extent of human-macaque overlap, and therefore it will be imperative to have information readily available about the population-level characteristics of *M. fascicularis*. Furthermore, systematic assessments of the impact and consequences of human-macaque sympatry are needed to guide future actions towards macaques. This volume is an attempt to compile information from experts around the world currently researching wild populations of *M. fascicularis* to gather and to impart what is known about the present population of long-tailed macaques. The volume is intended to be a resource for scientists and researchers interested in the biology of primate populations and the effects of human-wildlife interaction. Moreover, it should become a key source of information for organizations and policy-makers struggling to develop strategies and legislation for developing peaceful human-macaque communities and managing their interface between humans and long-tailed macaques.

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)xvi      *Preface*

The volume is broken into five major parts. Part I deals with the population of long-tailed macaques. Chapter 1 describes the basic population-level characteristics of long-tailed macaques, as well as explaining the features of the human–macaque interface. Chapters 2 and 3 focus on work from a group led by Dr Yuzuru Hamada from Kyoto University and Dr Aye Mi San from Myeik University, which has been doing extensive work throughout mainland Southeast Asia assessing the distribution and evolution of macaque species. These two chapters look at the first reports generated on the long-tailed macaque populations in Myanmar and the Peoples Republic of Laos. Part II looks in more detail at the human–macaque interface, and in this section we are introduced to situations in Malaysia, Thailand, Singapore and Bali, Indonesia. Chapter 7 closes the section on the human–macaque interface by detailing the concerns of transmission of infectious agents between humans and macaques. Part III focuses attention on the colonization of long-tailed macaques beyond their natural range, and Chapters 8–10 are focused on the exotic populations in Mauritius and Palau. Part IV is a short section looking at the closest relative of long-tailed macaques, the rhesus macaque (*M. mulatta*), and in Chapter 11, Dr Charles Southwick's 50 plus years of research in India is summarized to show how rhesus populations and human–macaque contact have changed over that time. Part V brings the volume to a close by providing various approaches and needs for studying and managing long-tailed macaques and their interface with humans. In Chapter 12, we discuss potential resolutions to lessen human–macaque conflict and develop sustainable human–macaque communities (i.e., communities where macaques and humans can coexist without major conflict and without serious threats to each other's health, wellbeing, or existence). Chapter 13 outlines the future directions for researching macaque populations, provides a discussion on approaches to studying macaque synanthropy, and questions the need for conservation programs for some parts of the population. Throughout the volume, boxes are presented from separate authors to supplement the chapters. These short excerpts provide detailed information of specific activities being carried out in the field to better understand the population or to help resolve human–macaque conflict.



Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

---

## Acknowledgements

This volume is the result of two international workshops on the relationship between humans and long-tailed macaques. In 2007, we held the *Macaca fascicularis Workshop: Resolving Macaque-Human Conflicts* at the 30th meeting of the American Society of Primatologists in Wake Forest, North Carolina. Later, in 2008, we continued our discussions by holding the *Macaca fascicularis Workshop: Understanding and Managing Macaque-Human Commensalism* and an associated roundtable discussion at the XXII Congress of the International Primatological Society in Edinburgh, UK. The products of these gatherings eventually became this volume.

We would like to express our gratitude to the invited panel members and speakers that attended these programs: Nantiya Aggimarangsee, Irwin Bernstein, Antje Engelhardt, Joseph Erwin, Ardith A. Eudey, Yuzuru Hamada, Entang Iskandar, Randall C. Kyes, Badrul Munir Md-Zain, Benjamin P. Y-H. Lee, Suchinda Malaivijitnond, Stephen J. Schapiro, Charles Southwick, Robert Sussman, and Bruce B. Wheatley. We would also like to thank Mathew F. S. X. Novak, Allyson Bennett, Paul Honess, Phyllis Lee, and Alexander Weiss for their assistance in organizing and advertising these events at the conferences. We further extend great thanks to the many others who attended and participated in the open workshops and discussions.

Special thanks are given to Regina Liszanckie and Nurul Haiyu Binti Rosli for providing helpful administrative support during the preparation of this volume. We finally would like to thank Lynette Talbot, Martin Griffiths, Sally Philip, Zewdi Tsegai, Jo Bottrill, Matt Davies, and John Normansell for their assistance and guidance during editing and production. Grant RG95/07 from the Academic Research Fund of Nanyang Technological University, provided by the Ministry of Education, Singapore supported parts of the production of this book.

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed Macaques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)



A stone statue at Sangeh Monkey Forest, Bali, Indonesia depicts an evil giant from the Ramayana, Kumbakarna, being attacked by an army of long-tailed macaques. Kumbakarna is the brother of the epic's evil antagonist, Rawana, and was convinced by him to fight against the hero, Rama. Kumbakarna tried to convince Rawana to stop the unnecessary war, but out of loyalty to his own kind, agreed to fight. In the Ramayana, macaques represented an army of warriors that assisted Rama to fight against a powerful evil and save his true love, Sita. In the real world, macaques live on the edge of our own war to conquer and control our global environment. As in the Ramayana, the macaques fight against a powerful force; and like Kumbakarna, maybe we too are knowingly fighting an unworthy war. Photograph by Michael D. Gumert.

Cambridge University Press

978-0-521-76433-9 - Monkeys on the Edge: Ecology and Management of Long-Tailed  
Macques and their Interface with Humans

Edited by Michael D. Gumert, Agustin Fuentes and Lisa Jones-Engel

Frontmatter

[More information](#)

---

“Ramadewa looked at the numerous troops of monkeys. They were at ease and happy and showed their liveliness. All their movements, their noisy voices, their way of sleeping on branches made him happy just to look at them.”

Verse 151:VI from the Ramayana Kakawin,  
as translated from Javanese by  
Soewito Santoso, 1980.