

Gibbon Conservation in the Anthropocene

Hylobatids (gibbons and siamangs) are the smallest of the apes, distinguished by their coordinated duets, territorial songs, arm-swinging locomotion and small family group sizes. Although they are the most speciose of the apes, boasting 20 species living in 11 countries, 95 per cent are critically endangered or endangered according to the IUCN's Red List of Threatened Species. Despite this, gibbons are often referred to as being 'forgotten' in the shadow of their great ape cousins because comparably they receive less research, funding and conservation attention. This is only the fourth scientific book since the 1980s devoted to gibbons, and presents cutting-edge research covering a wide variety of topics including hylobatid ecology, conservation, phylogenetics and taxonomy. Written by gibbon researchers and practitioners from across the world, the book discusses conservation challenges in the Anthropocene and presents practice-based approaches and strategies to save these singing, swinging apes from extinction.

Susan M. Cheyne is co-director of Borneo Nature Foundation International and Vice-Chair for the IUCN Primate Specialist Group Section on Small Apes. She received the 2017 Marsh Award for Conservation Biology in partnership with the Zoological Society of London. She is also a Royal Geographical Society Fellow and an IUCN Cat Specialist Group member.

Carolyn Thompson is an early career interdisciplinary researcher with University College London and the Zoological Society of London's Institute of Zoology. She has more than 15 years' experience working in the field of primatology. The majority of her research has focused on Asian primates, with the exception of lemurs in Madagascar. Her research interests include human-primate interactions, ethnoprimate methods, conservation education and primate conservation. Carolyn is the Student Representative for the IUCN Primate Specialist Group Section on Small Apes.

Peng-Fei Fan is a Professor in the School of Life Sciences, Sun Yat-Sen University, Guangzhou, People's Republic of China. He has been studying the behaviour, ecology and conservation of primates, mostly gibbons, in China since 2002. Along with his colleagues, he discovered the white-cheeked macaque (*Macaca leucogenys*) and sky-walker hoolock gibbon (*Hoolock tianxing*). He has published more than 80 peer-reviewed papers and currently serves as Associate Editor or Editorial Board Member for five scientific journals.

Helen J. Chatterjee is Professor of Human and Ecological Health at University College London. Her research is focused on biodiversity conservation and evidencing the links between the health of the environment and the health of people. Helen serves on the Executive Committee for the IUCN Primate Specialist Group Section on Small Apes. In 2015 she received an MBE for services to Higher Education and Culture.

Cambridge University Press & Assessment

978-1-108-47941-7 – Gibbon Conservation in the Anthropocene

Edited by Susan M. Cheyne , Carolyn Thompson , Peng-Fei Fan , Helen J. Chatterjee

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Edited by

SUSAN M. CHEYNE

Borneo Nature Foundation

CAROLYN THOMPSON

University College London

PENG-FEI FAN

Sun Yat-Sen University

HELEN J. CHATTERJEE

University College London



CAMBRIDGE
UNIVERSITY PRESS

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Shaftesbury Road, Cambridge CB2 8EA, United Kingdom
One Liberty Plaza, 20th Floor, New York, NY 10006, USA
477 Williamstown Road, Port Melbourne, VIC 3207, Australia
314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi – 110025, India
103 Penang Road, #05–06/07, Visioncrest Commercial, Singapore 238467

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www.cambridge.org

Information on this title: www.cambridge.org/9781108479417

DOI: 10.1017/9781108785402

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First published 2023

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

Library of Congress Cataloging-in-Publication Data

Names: Cheyne, Susan M., 1976– editor. | Thompson, Carolyn, 1985– editor. | Fan, Peng-Fei, 1981– editor. | Chatterjee, Helen J., editor.

Title: Gibbon conservation in the Anthropocene / edited by Susan M. Cheyne (Borneo Nature Foundation), Carolyn Thompson (University College London), Peng-Fei Fan (Sun Yat-Sen University), Helen J. Chatterjee (University College London).

Description: Cambridge, United Kingdom : Cambridge University Press, 2023. | Includes bibliographical references and index.

Identifiers: LCCN 2022047140 (print) | LCCN 2022047141 (ebook) | ISBN 9781108479417 (hardback) | ISBN 9781108743037 (paperback) | ISBN 9781108785402 (epub)

Subjects: LCSH: Gibbons. | Gibbons–Conservation.

Classification: LCC QL737.P943 G53 2023 (print) | LCC QL737.P943 (ebook) | DDC 599.88/2–dc23/eng/20221018

LC record available at <https://lcn.loc.gov/2022047140>

LC ebook record available at <https://lcn.loc.gov/2022047141>

ISBN 978-1-108-47941-7 Hardback

Additional resources for this publication at www.cambridge.org/gibbonconservation

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Cambridge University Press & Assessment

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Contributors

Abdulaziz K

Borneo Nature Foundation Indonesia, Palangka Raya, Central Kalimantan, Indonesia

Abdullah Abdullah

Department of Biology, Universitas Syiah Kuala, Banda Aceh, Aceh, Indonesia

Adul

Borneo Nature Foundation Indonesia, Palangka Raya, Central Kalimantan, Indonesia

Anton Ario

Konservasi Indonesia; Javan Gibbon Centre, Bogor, West Java, Indonesia

Richard M. Badge

Department of Genetics and Genome Biology, University of Leicester, Leicester, UK

Parimal Chandra Bhattacharjee

Department of Zoology, Gauhati University, Guwahati, Assam, India

Hélène Birot

Borneo Nature Foundation International, Tremough Innovation Centre, Penryn, UK

Jihosuo Biswas

Primate Research Centre Northeast India, Guwahati, Assam, India

Kristiana Brink

Department of Genetics and Genome Biology, University of Leicester, Leicester, UK

Eka Cahyaningrum

Borneo Nature Foundation Indonesia, Palangka Raya, Central Kalimantan, Indonesia

Lucia Carbone

Knight Cardiovascular Institute, Department of Medicine, Oregon Health and Science University; and Division of Genetics, Oregon National Primate Research Center, Portland, Oregon, USA

Reychell Chadwick

Borneo Nature Foundation International, Tremough Innovation Centre, Penryn, UK

Bosco Pui Lok Chan

Kadoorie Conservation China Department, Kadoorie Farm and Botanic Garden, Hong Kong SAR, People's Republic of China

Helen J. Chatterjee

Genetics, Evolution and Environment, School of Life Sciences, University College London, London, UK

Dilip Chetry

Primate Research and Conservation Division, Aaranyak, Guwahati, Assam, India

Rekha Chetry

Department of Zoology, Jawaharlal Nehru College, Boko, Assam, India

Susan M. Cheyne

School of Social Sciences, Oxford Brookes University, Oxford; and Borneo Nature Foundation International, Tremough Innovation Centre, Penryn, UK

Jae Chun Choe

Division of Ecoscience, Ewha Womans University, Seoul, South Korea

Ahyun Choi

Interdisciplinary Program of EcoCreative, Ewha Womans University, Seoul, South Korea

Diplob Chutia

Barekuri EDC, Dighal Haku Village, Tinsukia, Assam, India

Herbert H. Covert

Department of Anthropology, University of Colorado Boulder, Boulder, Colorado, USA

Jayanta Das

Wildlife Areas Development and Welfare Trust, Guwahati, Assam, India

Katie Dripps

Department of Genetics and Genome Biology, University of Leicester, Leicester, UK

Peng-Fei Fan

School of Life Sciences, Sun Yat-Sen University, Guangzhou, People's Republic of China

Agung Gunawan

Balai Besar Taman Nasional Gunung Gede Pangrango, Cianjur, Jawa Barat, Indonesia

Soojung Ham

Division of Ecoscience, Ewha Womans University, Seoul, South Korea

Emma L. Hankinson

School of Social Sciences, Oxford Brookes University, Oxford, UK

Ross A. Hill

Science and Technology, Bournemouth University, Poole, UK

Chuong Van Hoang

GreenViet, Da Nang City, Vietnam

Duc Minh Hoang

Southern Institute of Ecology, Vietnam Academy of Science and Technology, Ho Chi Minh City, Vietnam

Edward J. Hollox

Department of Genetics and Genome Biology, University of Leicester, Leicester, UK

Haneul Jang

Department of Human Behavior, Ecology and Culture, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

Sanha Kim

Biodiversity Foundation, Seoul, South Korea

Intanon Kolasartsanee

Ecoliteracy and Conservation in Action Group, Department of Biology, Faculty of Science, Mahidol University, Bangkok, Thailand

Amanda H. Korstjens

Science and Technology, Bournemouth University, Poole, UK

H.N. Kumara

Sálim Ali Centre for Ornithology and Natural History, Anaikatty, Tamil Nadu, India

Lauren Lansdowne

Department of Genetics and Genome Biology, University of Leicester, Leicester, UK

Susan Lappan

Department of Anthropology, Appalachian State University, Boone, North Carolina, USA; and Malaysian Primatological Society, Kulim, Malaysia

Vivienne Li

Department of Genetics and Genome Biology, University of Leicester, Leicester, UK

Matyas Liptovszky

Perth Zoo, South Perth, WA, Australia

Yik Fui Philip Lo

Kadoorie Conservation China Department, Kadoorie Farm and Botanic Garden, Hong Kong SAR, People's Republic of China

Chang-Yong Ma

College of Life Sciences, Guangxi Normal University, Guilin, Guangxi Province, People's Republic of China

Ani Mardiasuti

Department of Forest Resources Conservation and Ecotourism, Faculty of Forestry and Environment, IPB University, Darmaga Bogor, West Java, Indonesia

Christopher D. Marsh

Department of Life and Environmental Sciences, Bournemouth University, Poole, UK; and Department of Biology, University of New Mexico, Albuquerque, New Mexico, USA

Jayashree Mazumder

Department of Humanities and Social Sciences, Indian Institute of Science Education and Research, Mohali, Punjab, India

Vincent Nijman

School of Social Sciences, Oxford Brookes University, Oxford, UK

Matthew G. Nowak

The PanEco Foundation – Sumatran Orangutan Conservation Programme, Berg am Irchel, Switzerland; Sumatran Orangutan Conservation Programme, Medan Selayang,

North Sumatra, Indonesia; and Department of Anthropology, Southern Illinois University, Carbondale, Illinois, USA

Mariam Okhovat

Knight Cardiovascular Institute, Department of Medicine, Oregon Health and Science University, Portland, Oregon, USA

Rahayu Oktaviani

Javan Gibbon Research and Conservation Project, Bogor; and Yayasan Konservasi Ekosistem Alam Nusantara (KIARA), Kabupaten Bogor, West Java, Indonesia

Stephanie A. Poindexter

Department of Anthropology, State University of New York at Buffalo, Buffalo, New York, USA

Christian Roos

Gene Bank of Primates, Primate Genetics Laboratory, German Primate Center, Leibniz Institute for Primate Research, Göttingen, Germany

Arif Setiawan

SWARAOWA, Kalipenthung, Yogyakarta; and Coffee and Primate Conservation Project, Central Java, Indonesia

Joydeep Shil

Manipal Academy of Higher Education, Manipal, Karnataka; and Sálím Ali Centre for Ornithology and Natural History, Anaikatty, Tamil Nadu, India

Jaima H. Smith

School of Social Sciences, Oxford Brookes University, Oxford, UK

Sompoad Srikosamatara

Ecoliteracy and Conservation in Action Group, Department of Biology, Faculty of Science, Mahidol University, Bangkok, Thailand

Supiansyah

Borneo Nature Foundation Indonesia, Palangka Raya, Central Kalimantan, Indonesia

Damianus Tateburuk

Malinggai Uma Traditional Mentawai, Mentawai, Sumatra, Indonesia

Carolyn Thompson

Genetics, Evolution and Environment, School of Life Sciences, University College London; and Institute of Zoology, Zoological Society of London, London, UK

Claire J.H. Thompson

Borneo Nature Foundation International, Tremough Innovation Centre, Penryn, UK

Lindy Thompson

Borneo Nature Foundation International, Tremough Innovation Centre, Penryn, UK

Bang Van Tran

Southern Institute of Ecology, Vietnam Academy of Science and Technology, Ho Chi Minh City, Vietnam

Samuel T. Turvey

Institute of Zoology, Zoological Society of London, London, UK

Twentinolosa

Borneo Nature Foundation Indonesia, Palangka Raya, Central Kalimantan, Indonesia

Cara H. Wilcox

Borneo Nature Foundation International, Tremough Innovation Centre, Penryn, UK

Yoonjung Yi

Laboratory of Animal Behaviour and Conservation, College of Biology and the Environment, Nanjing Forestry University, Nanjing, People's Republic of China; and Division of Ecoscience, Ewha Womans University, Seoul, South Korea

Cambridge University Press & Assessment

978-1-108-47941-7 – Gibbon Conservation in the Anthropocene

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Foreword

I first set foot in the jungles of Southeast Asia 64 years ago, following in the footsteps of the great pioneer of primate field studies, Clarence Ray Carpenter, whom I had first followed to study the howler monkeys of Barro Colorado Island in the Panama Canal Zone in 1967 with the Smithsonian Tropical Research Institute. I first met him in September 1967 while on my way back to the UK. I had detoured to visit most of the howler monkey and gibbon researchers based in the USA. He was a really charming and modest man, very supportive of my research, and was living in a house on the campus of Pennsylvania State University.

That was an auspicious month because my first contact in the USA was at Berkeley, California, with Colin Groves, that great gibbon taxonomist, with whom I maintained close contact until his sad death a few years ago. Then I went down to the redwoods of La Honda, California, to meet John Ellefson, the second gibbon field worker, who studied lar gibbons (*Hylobates lar*) on the coast of the Malay Peninsula, while his wife Judy studied long-tailed macaques (*Macaca fascicularis*) in the Singapore Botanic Garden.

Carpenter had studied lar gibbons in Thailand as part of the Asian Primate Expedition in 1937 with the great primate anatomist Adolf Schultz and the anthropologist Sherry Washburn, at the invitation of that famous zoologist with an interest in gorillas, Harold Jefferson Coolidge, Founding Director of the International Union for Conservation of Nature (IUCN) and then World Wildlife Fund. Sadly, as this was still the age of collectors, they collected 233 gibbons and then, while Carpenter continued his seminal field study, they went on to Sabah, Malaysia, to collect 47 more, and seven orangutans. If there is any good news about this, Schultz's meticulous studies provided the substantial basis of gibbon skeletal anatomy that has been invaluable to many, including Colin Groves.

I met Carpenter and Schultz again in 1970 at the Third Congress of the International Primatological Society (IPS) in Zurich, Switzerland, where I gave my first paper on gibbons. While Carpenter was a generous chairman, the co-chairman, Helmut Hofer, rudely told me to conclude as soon as I overran!

And so I started my two-year field study of the siamang (*Symphalangus syndactylus*) in May 1968 with seven months of surveys all over the Malay Peninsula, and then 17 months in two sites in Pahang (Ulu Sempam in the Main Range in the west, and Kuala Lompat in the Krau Game Reserve, lowland forest at the foot of the central massif of Gunung Benom).

Within 15 years sufficient data had been generated on gibbons – the ‘small’ rather than ‘lesser’ apes – to hold a conference in 1980 at Schloss Reisingen, near Ulm, on the German Danube, hosted by Holger Preuschoft, on all aspects of gibbon biology. It was here that I learnt about ‘round-table discussions’, which were even more productive than the day-time sessions, lasting well into the night. We gathered in round turrets with round tables within falling distance of fridges full of German beer and wine. There were 48 contributors to 46 chapters covering over 709 pages, edited by Preuschoft, Chivers, Brockelman and Creel, published in 1984, with sections on conservation; functional morphology; ecology, feeding and ranging; social behaviour; and evolutionary biology.

The University of Cambridge field input was made by myself, Jeremy Raemaekers, Paul Gittins and Tony Whitten, all of whom are sadly deceased, with the involvement of John Fleagle from Harvard University, and John and Kathy MacKinnon from the University of Oxford. From overseas, the players included Rich Tenaza and Ron Tilson, Dede Leighton, Markus Kappeler, Warren Brockelman and Sompoad Srikosamatara.

Following on 25 years later, the second major synthesis was initiated at the 2002 IPS Congress at a symposium organised by Thomas Geissmann, and published in 2009 by Susan Lappan and Danielle Whitaker, entitled *The Gibbons: New Perspectives on Small Ape Socio-ecology and Population Biology*. There were 45 contributors to 24 chapters covering over 523 pages, with sections on biogeography, diet and community ecology, relationship between ecology and social organisation, mating systems and reproduction, and conservation biology. The University of Cambridge contribution came from Susan Cheyne, Kim McConkey and Achmad Yanuar in Indonesia.

And so to 2022, another 13 years on, with this third synthetic volume, *Gibbon Conservation in the Anthropocene*, edited by Helen Chatterjee, Susan Cheyne, Peng-Fei Fan and Carolyn Thompson. What I find incredible is that, nearly 40 years on from the first volume, there is apparently just one contributor still researching gibbons: Sompoad Srikosamatara in Thailand (with Warren Brockelman lurking in the background). Again, the scope is more restricted, with the focus on ecology and, especially, conservation, but there are 65 (the most yet) contributors to the 18 chapters. The initial emphasis is on the endangered crested gibbons of China and Vietnam (*Nomascus* spp.), as well as on the moloch gibbon of Java (*Hylobates moloch*), the Kloss’s gibbon (*Hylobates klossii*) of the Mentawai Islands, the pileated gibbon (*Hylobates pileatus*) of Thailand and the hoolock gibbons (*Hoolock* spp.) of Assam, India. Sadly, there is nothing from Myanmar, Cambodia and Laos.

There is an emphasis on cultural and historical perspectives, with a final reference to genetics and phylogenetics. The diversity and intensity of threats to gibbons are alarming. The coronavirus pandemic has led to an increase in the significance of local researchers, well reflected in this volume in relation to international collaboration. The 2020 survey of members of the IUCN Primate Specialist Group Section on Small Apes identifies 22 priority areas for future gibbon research and conservation, with eight main recommendations emerging.

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It was a privilege to be in the first generation of gibbonologists, to supervise the doctoral theses of a dozen of them that followed, and it is an honour to welcome this new, dynamic and very productive volume.

Professor David J. Chivers
Professor Emeritus in Primate Biology and Conservation
University of Cambridge
March 2022

Abbreviations

ANOVA	analysis of variance
APFD	Arunachal Pradesh Forest Department
ASCR	acoustic spatial capture–recapture
a.s.l.	above sea level
AUC	area under the receiver operating curve
BCE	Before Common Era
BNF	Borneo Nature Foundation
bp	base pair
CALS	Cagar Alam Leuweung Sancang
CE	Common Era
CIMTROP	Centre for International Cooperation in Management of Tropical Peatland
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CVGCA	Cao Vit Gibbon Conservation Area
CWRC	Centre for Wildlife Rehabilitation and Conservation
DBH	diameter at breast height
DEM	digital elevation model
DSM	digital surface model
EAZA	European Association of Zoos and Aquaria
ENM	environmental niche modelling
FFI	Fauna and Flora International
GGPNP	Gunung Gede-Pangrango National Park
GHSNP	Gunung Halimun-Salak National Park
GPS	Global Positioning System
HGWS	Hoollongapar Gibbon Wildlife Sanctuary
HR	home range
IBI	inter-birth interval
ICU	intensive care unit
IFAW	International Fund for Animal Welfare
IUCN	International Union for Conservation of Nature
JGC	Javan Gibbon Rescue and Rehabilitation Centre
kb	kilobase
KFBG	Kadoorie Farm and Botanic Garden
KSD	Khao Soi Dao Wildlife Sanctuary

KY	Khao Yai National Park
LEK	local ecological knowledge
LiDAR	light detection and ranging
MSF	mixed swamp forest
MU	Mahidol University
NGO(s)	non-governmental organisation(s)
NLPSF	National Laboratory of Peat-Swamp Forest
NP	national park
NR	nature reserve
NSF	National Science Foundation
NTFPs	non-timber forest products
PCR	polymerase chain reaction
PHVA	population and habitat viability analysis
PPKAB	Pusat Pendidikan Konservasi Alam Bodogol
SD	standard deviation
SDM	species distribution modelling
SfM	structure from motion software
SINE	short interspersed nuclear element
SMART	Spatial Monitoring and Reporting Tool
SNPs	single nucleotide polymorphisms
SOCP	Sumatran Orangutan Conservation Programme
SRTM	Shuttle Radar Topography Mission
SSA	IUCN's Primate Specialist Group's Section on Small Apes
SSP	Species Survival Plan
STRs	short tandem repeats
SVAA	Sauvegarde de la Vie Animale Arboricole
TEK	traditional ecological knowledge
TEs	transposable elements
TNGL	Taman Nasional Gunung Leuser
UAVs	unmanned aerial vehicles
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VNTR	variable number tandem repeat
WTI	Wildlife Trust of India

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