The International Journal of Conservation

Oryx

www.oryxthejournal.org

Published for
Fauna & Flora International

October 2019 · Volume 53 · Number 4



Carnivore conservation

https://doi.org/10.1017/S0030605319001054

Oryx The International Journal of Conservation

ISSN 0030-6053 Fauna & Flora International
A company limited by guarantee registered in England 2677068
Registered Charity 1011102
A non-profit charitable institution ABN 75132715783 in Australia
A non-profit organization EIN #81-3967095 in the USA
Twitter @FaunaFloraInt @OryxTheJournal

FFI, The David Attenborough Building, Pembroke St, Cambridge CB2 3QZ, UK
Tel: +44 1223 571000; Fax: +44 1223 461481
E-mail info@fauna-flora.org fauna-flora.org

FFI Australia, PO Box R697, Royal Exchange, NSW 1225, Australia
E-mail ffiaustralia@fauna-flora.org
FFI USA, 1720 N Street NW, Fourth Floor, Washington, D.C. 20036, USA. E-mail ffiusa@fauna-flora.org

Editor
Dr Martin Fisher *FFI, UK*

Managing Editor
Julia Hochbach *FFI, UK*

Editorial Assistant
Emma Muench *FFI, UK*

Senior Editors
Professor Bill Adams *University of Cambridge, UK*
Professor Andrew Balmford, FRS *University of Cambridge, UK*
Dr Porter P. Lowry II *Missouri Botanical Garden, USA and France*
Dr Mike Maunder *Eden Project, UK*
Professor Jeffrey A. McNeely *Thailand*
Professor E. J. Milner-Gulland *University of Oxford, UK*
Dr John G. Robinson *Wildlife Conservation Society, USA*
Professor William Sutherland *University of Cambridge, UK*

International Board of Editors
Dr Elizabeth L. Bennett *USA*
Professor Neil Burgess *Denmark*
Professor Lisa Campbell *USA*
Dr Liana Chua *UK*
Dr Jenny Daltry *UK*
Dr Aparajita Datta *India*
Dr Abigail Entwistle *UK*
Dr Joice Ferreira *Brazil*
Dr Brendan Fisher *USA*
Professor Brendan J. Godley *UK*
Professor Rhys Green *UK*
Dr George Holmes *UK*
Professor Zhigang Jiang *China*
Professor Julia Jones *UK*
Dr K. Ullas Karanth *India*
Professor Gustavo Kattan *Colombia*
Professor Sandra Knapp *UK*
Ashish Kothari *India*
Professor Sarah Legge *Australia*
Dr David Mallon *UK*
Sara Oldfield, OBE *UK*
Dr Kent H. Redford *USA*
Dr Jon Paul Rodriguez *Venezuela*
Dr Anthony B. Rylands *USA*
Professor Philip Seddon *New Zealand*
Dr Noah Sitati *Kenya*
Dr Bob Smith *UK*
Dr Paul Smith *UK*
Professor Rashid Sumaila *Canada*
Dr Matt Walpole *UK*

Fauna & Flora International
Patron
Her Majesty The Queen

President
HRH Princess Laurentien of The Netherlands

Vice Presidents
Lisel Alamilla
Baroness Amos
Sir David Attenborough, OM, FRS
Professor David Bellamy, OBE
The Lord Browne of Madingley, FR Eng
Lindsay Bury
Dee Caffari
Charlene de Carvalho-Heineken
Field Marshal Sir John Chapple, GCB, CBE, DL
Viscount Philippe de Spoelberch
Giles Clark
Dame Judi Dench
Dr Lee Durrell
Hugh Fearnley-Whittingstall
Dorette Louise (Dielle) Fleischmann
Stephen Fry
Rupert Goodman
Edward Hoare
Anders Johansson
The Lady Emma Kitchener LVO
Rove McManus
Justin Mundy
Blaine T. Phillips
Sir John Randall
Dr Lisbet Rausing
Dr Claudio Segré
The Rt Hon Mark Simmonds
Hugh Sloane
Victoria Stack
Jon L. Stryker
Charles Whitbread
Dr Adrian Wilson
James Wong
The Rt Hon Baroness Young of Old Scone
Jochen Zeitz

Council
Chair Andrew Sykes
Vice Chair
Dr Mike Maunder
Treasurer Paul Baldwin

Anna Gavazzi
David Gibson
Andrew Joy
Professor Sandra Knapp
Annette Lanjouw
Richard Plackett
Sir Gareth Rhys-Williams
Edward van Cutsem
Diana van de Kamp
Professor Bhaskar Vira
Hugo van Vredenburch
Richard Walker

Chief Executive Officer Mark Rose

US Board of Directors
President Professor Sandra Knapp
Secretary Diana van de Kamp

Diane Alfano
Dorette Louise (Dielle) Fleischmann

Australian Board of Directors
Chairman Michael Forsdick

Nick Bubb
Dr Angela Dwyer
Mark Rose

Institutional subscription *Oryx* (ISSN 0030-6053) is published four times per year (one volume per annum) in January, April, July, and October. The 2019 sub-scription price (excluding VAT) of a volume, which includes print and electronic access, is £784.00 (US $1411.00 in USA, Canada and Mexico). The electronic-only price available to institutional subscribers is £622.00 (US $1115.00 in USA, Canada and Mexico). Orders, which must be accompanied by payment, may be sent to any book seller, subscription agent or direct to the publisher: Cambridge University Press, Journals Fulfillment Department, UPH, Shaftesbury Road, Cambridge CB2 8BS, UK; or in the USA, Canada and Mexico: Journals Fulfillment Department, Cambridge University Press, 1 Liberty Plaza, Floor 20, New York, NY, 10006, USA. EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered members should provide their VAT registration number. Japanese prices for institutions (including ASP delivery) are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo 156, Japan. Prices include delivery by air. Periodicals postage paid at New York, NY, and at additional mailing offices. *Postmaster*: send address changes in USA, Canada and Mexico to: *Oryx*, Cambridge University Press, 1 Liberty Plaza, Floor 20, New York, NY, 10006, USA. Claims for missing issues should be made immediately on receipt of the subsequent issues.

FFI member subscription Membership of Fauna & Flora International starts from £45 a year for concessions and £85 for other members (or equivalent price in dollars/euros). For more information about FFI membership visit fauna-flora.org/membership. Enquiries about back issues for members should be addressed to the Membership Secretary at FFI (members@fauna-flora.org).

Back volumes Copies of the current volume and two previous volumes can be obtained from Cambridge University Press at the above address. Requests for previous volumes should be directed to the Membership Secretary at FFI (members@fauna-flora.org).

Copyright and permissions Permission to copy (for users in the USA) is available from Copyright Clearance Center (copyright.com), email: info@copyright.com. Organizations authorized by the UK Copyright Licensing Agency may also copy material subject to the usual conditions. For all other use, permission should be sought from Cambridge University Press. No part of this publication may otherwise be reproduced, stored or distributed by any means without permission in writing from Cambridge University Press, acting for the copyright holder.

Internet access This journal is included in *Cambridge Core*, which can be found at cambridge.org/oryx. For further information on other Press titles access cambridge.org.

Paper *Oryx* is printed on FSC-certified paper and cover board. FSC (fsc.org) is an independent, non-government, not-for-profit organization established to promote the responsible management of the world's forests.

.

https://doi.org/10.1017/S0030605319001054 Published online by Cambridge University Press