# The International Journal of Conservation





# The International Journal of Conservation

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, c/o Purpose Accounting, 583 Elizabeth St, Redfern NSW 2016, 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 Officer**

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 Cambridge Conservation

Initiative, 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 USA and 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 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

HRH The Duke of Cambridge

### President

HRH Princess Laurentien of The Netherlands

### Vice Presidents

Baroness Valerie Amos, LC, CH, PC Professor Sir Roy Anderson, FRS, FMedSci Sir David Attenborough, OM, FRS The Lord Browne of Madingley, FR Eng

Lindsay Bury Dee Caffari

Charlene de Carvalho-Heineken

Field Marshal Sir John Chapple, GCB, CBE, DL

Giles Clark

Viscount Philippe de Spoelberch

Dame Judi Dench, CH

Dr Lee Durrell

Hugh Fearnley-Whittingstall

Stephen Fry Rupert Goodman Edward Hoare Tim Jarvis, AM

Anders Johansson The Lady Emma Kitchener, LVO

Rove McManus Iustin Mundy, LVO Blaine T. Phillips

The Rt Hon the Lord Randall of Uxbridge

Dr Lisbet Rausing Gareth Rhys Williams Dr Claudio Segré

The Rt Hon Mark Simmonds

Victoria Stack Jon L. Stryker Andrew Sykes

Edward van Cutsem

Antonio Versace Charles Whitbread, DL

Dr Adrian Wilson

James Wong

The Rt Hon Baroness Young of Old Scone Jochen Zeitz

### Council

Chair Hugo van Vredenburch Vice Chair Annette Lanjouw Treasurer Paul Baldwin

Jeffrey Blumberg Anna Gavazzi David Gibson

Senator Abshiro Halake Benjamin Khalili

Richard Plackett Dr Liz Rogers

Hugh Sloane Kimberly Stewart

Diana van de Kamp Richard Walker

Professor Joanne Webster, FLS, FRSB

# **Chief Executive Officer Mark Rose**

**US Board of Directors** 

President Professor Sandra Knapp Secretary Diana van de Kamp

Diane Alfano Millie Kerr

**Australian Board of Directors** Chairman Michael Forsdick

Nick Bubb Dr Angela Dwyer Jonny Wright

**Open access and publication charges** *Oryx* (ISSN 0030-6053) is published six times per year (one volume per annum) in January, March, May, July, September and November. As a gold open access journal, Oryx is published without access restrictions and receives no subscription revenue. The costs of publication are partially covered by an article processing charge levied upon authors, their funding bodies or institutions. The 2022 charge is GBP 1,950/USD 2,950 for peer-reviewed contributions. No charge is payable for Conservation News items, Letters, Letter Responses, Book Reviews or Editorials. Members of Fauna & Flora International receive a 15% discount on the article processing charge. Oryx is committed to supporting all conservationists, and discounts and waivers are available to authors unable to pay the full article processing charge. For full details visit oryxthejournal.org/about/open-access.

FFI Oryx member subscription Oryx membership of Fauna & Flora International starts from GBP 45 per year for concessions and GBP 85 for other members (or equivalent price in USD/EUR). For more information about FFI Oryx membership visit fauna-flora.org/appeals/oryx.

Internet access This journal is freely available to read on Cambridge Core at cambridge.org/oryx. For other Press titles access cambridge.org.

Submission of manuscripts Guidelines for authors are available online at oryxthejournal.org/authors/guidelines-for-authors. Manuscripts should be submitted at mc.manuscriptcentral.com/orvx.

**Back volumes** Print copies of the current volume and two previous volumes can be obtained from Cambridge University Press at Cambridge University Press, Journals Fulfilment Department, University Printing House, Shaftesbury Road, Cambridge, CB2 8BS, UK; or in the USA, Canada and Mexico: Journals Fulfilment Department, Cambridge University Press, 1 Liberty Plaza, Floor 20, New York, NY, 10006, USA. Requests for previous volumes should be directed to the editorial office at oryx@fauna-flora.org.

**Paper and printing** *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. Printed in Great Britain by Bell & Bain Ltd, Glasgow.