

The International Journal of Conservation

Oryx

www.oryxthejournal.org

Published for **Fauna & Flora**

September 2024 · Volume 58 · Number 5

**Plant
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

X/Twitter @FaunaFloraInt @OryxTheJournal

Fauna & Flora, The David Attenborough Building, Pembroke St,

Cambridge CB2 3QZ, UK

Tel +44 1223 571000

E-mail info@fauna-flora.org fauna-flora.org

Fauna & Flora Australia, c/o Purpose Accounting, 583 Elizabeth St,

Redfern NSW 2016, Australia. E-mail ffaustalia@fauna-flora.org

Fauna & Flora USA, One Thomas Circle NW, Suite 700, Washington, D.C. 20005, USA. E-mail ffusa@fauna-flora.org

Editor

Dr Martin Fisher *Fauna & Flora, UK*

Managing Editor

Julia Hochbach *Fauna & Flora, UK*

Editorial Officer

Emma Sinnett *Fauna & Flora, 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 *UK*

Professor Jeffrey A. McNeely *Thailand*

Professor Dame E. J. Milner-Gulland *University of Oxford, UK*

Dr John G. Robinson *Wildlife*

Conservation Society, USA

Professor William Sutherland, FRS *University of Cambridge, UK*

International Board of Editors

Dr Elizabeth L. Bennett *USA*

Dr Mar Cabeza *Finland*

Professor Lisa Campbell *USA*

Dr Liana Chua *UK*

Dr Jenny Daltry *USA and UK*

Dr Aparajita Datta *India*

Dr Abigail Entwistle *UK*

Professor Brendan Fisher *USA*

Professor Brendan J. Godley *UK*

Professor Rhys Green *UK*

Professor George Holmes *UK*

Professor Zhigang Jiang *China*

Professor Julia Jones *UK*

Ashish Kothari *India*

Dr David Mallon *UK*

Dr Helen Newing *UK*

Sara Oldfield, OBE *UK*

Dr Kent H. Redford *USA*

Dr Jon Paul Rodríguez *Venezuela*

Dr Anthony B. Rylands *USA*

Professor Chris Sandbrook *UK*

Professor Philip Seddon *New Zealand*

Dr Aby Sene-Harper *USA*

Professor Bob Smith *UK*

Dr Paul Smith *UK*

Dr Matt Walpole *UK*

Fauna & Flora

Patron

HRH The Prince of Wales

President

HRH Princess Laurentien of The Netherlands

Vice President

Sir David Attenborough, OM, FRS

Nature Champions Network

Baroness Valerie Amos, LG, CH, PC

Professor Sir Roy Anderson, FRS, FMedSci

Georgina Bloomberg

The Lord Browne of Madingley, FR Eng

Lindsay Bury

Dee Caffari

Charlene de Carvalho-Heineken

Giles Clark

Dame Judi Dench, CH

Dr Lee Durrell

Hugh Fearnley-Whittingstall

Rupert Goodman

Edward Hoare

Tim Jarvis, AM

Anders Johansson

Rove McManus

Justin Mundy, LVO

Blaine T. Phillips

The Rt Hon the Lord Randall of Uxbridge

Dr Lisbet Rausing

Sir Gareth Rhys Williams, CB

Dr Claudio Segré

The Rt Hon Mark Simmonds

Victoria Stack

Jon L. Stryker

Andrew Sykes

Edward van Cutsem

Antonio Versace

Richard Walker, OBE

Charles Whitbread, DL

Dr Adrian Wilson

Nigel Winsor

The Rt Hon Baroness Young of Old Scone

Council

Chair Stephen Fitzgerald, AO

Vice Chair David Gibson

Treasurer Martin Tyler

Jeffrey Blumberg

Anna Gavazzi

Abshiro Halake

Tony Juniper, CBE

Christine Lloyd

Hernán González Merlani

Miguel Nogales

Dr Liz Rogers

Hugh Sloane

Tola St. Matthew-Daniel

Kimberly Stewart

Dominic Waughray

Professor Joanne Webster, FLS, FRSB

Chief Executive Officer Kristian Teleki

US Board of Directors

President Professor Sandra Knapp, OBE

Secretary Diana van de Kamp

Treasurer Lorenzo Nogales

Diane Alfano

Sara Andersen

Millie Kerr

Tola St. Matthew-Daniel

Rayne Sullivan

Australian Board of Directors

Chairman Michael Forsdick

Dr Chloe Buiting

Dr Angela Dwyer

Liz Ann MacGregor

Kristian Teleki

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 2024 charge is GBP 2,320/USD 3,450 for Articles, Reviews and Forum Articles (GBP 975/USD 1,475 for Short Communications). 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/authors/guidelines-for-authors/#open-access.

Fauna & Flora *Oryx* member subscription *Oryx* membership of Fauna & Flora starts from GBP 45 per year for concessions and GBP 100 for other members (or equivalent price in USD/EUR). For more information about Fauna & Flora *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/oryx.

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 is an independent, nongovernmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see fsc.org for more information.

Printed in the UK by Henry Ling Limited, The Dorset Press, Dorchester, DT1 1HD.