

The International Journal of Conservation

Oryx

Published for
Fauna & Flora International

www.oryxthejournal.org

May 2021 · Volume 55 · Number 3



Reptile & amphibian conservation

EditorDr 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

Lisel Alamilla

Baroness Valerie Amos, *CH*

Sir Roy Anderson

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

Dorette Louise (Dielle) Fleischmann

Stephen Fry

Rupert Goodman

Edward Hoare

Tim Jarvis

Anders Johansson

The Lady Emma Kitchener, *LVO*

Rove McManus

Justin Mundy, *LVO*

Blaine T. Phillips

The Rt Hon the Lord Randall of Uxbridge

Dr Lisbet Rausing

Dr Claudio Segré

The Rt Hon Mark Simmonds

Hugh Sloane

Victoria Stack

Jon L. Stryker

Andrew Sykes

Antonio Versace

Charles Whitbread, *DL*

Dr Adrian Wilson

James Wong

The Rt Hon Baroness Young of Old Scone

Jochen Zeitz

Council**Chair** Hugo van Vredenburg**Vice Chair** Annette Lanjouw**Treasurer** Paul Baldwin

Jeffrey Blumberg

Anna Gavazzi

David Gibson

Andrew Joy

Benjamin Khalili

Professor Sandra Knapp

Richard Plackett

Diana van de Kamp

Kimberly Stewart

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

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 2021 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 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 (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.