

VOLUME 23 No. 1 MARCH 1996

# ENVIRONMENTAL CONSERVATION

EDITOR: Nicholas V. C. Polunin  
*University of Newcastle, UK*

22-JUL-1996 BLDSC BOSTON SPA  
ENVIRONMENTAL CONSERVATION LS23 7BQ

\*ETOC



3791.415000

VOL 23 PART 1

JCP<sup>126</sup>

1/1

PB

**LOAN BAN** EXPIRES

20 JAN 1997

**CAMBRIDGE**  
UNIVERSITY PRESS

**ENVIRONMENTAL CONSERVATION**  
An International Journal of Environmental Science

*Environmental Conservation* aims to embrace all aspects of its field, including issues in: human institutions and attitudes; biodiversity, species losses and introductions; industry, pollution, and habitat degradation; movements and agencies; energy and materials sources; trade and conventions; terrestrial ecosystems and carrying capacity; dynamics of populations and ecosystems; atmospheric and oceanic processes; international environmental law; coastal zone management; and environmental economics.

**EDITOR**

Nicholas V.C. Polunin. Tel: +44 (0) 191 222 6675. E-mail: n.polunin@ncl.ac.uk

**Editorial Assistant**

Hazel Harrison. Tel: +44 (0) 191 222 6661. E-mail: h.harrison@ncl.ac.uk

*Department of Marine Sciences and Coastal Management, Ridley Building, University of Newcastle, Newcastle upon Tyne NE1 7RU, UK.*

**ASSOCIATE EDITORS**

**George M. Branch** (Coastal management)

*Department of Zoology, University of Cape Town, 7700 Rondebosch, South Africa*

**Philip M. Fearnside** (Tropical ecology)

*National Institute for Research in the Amazon – INPA, CP 478, 69.011-970*

*Manaus-Amazonas, Brazil*

**Nicholas J.P. Owens** (Oceans/Atmosphere)

*Department of Marine Sciences and Coastal Management, Ridley Building,*

*University of Newcastle, Newcastle upon Tyne NE1 7RU, UK*

**Nico J. Schrijver** (Law/Institutions)

*Institute of Social Studies, PO Box 29776, 2502 LT The Hague, The Netherlands*

**Garry W. Trompf** (Ethics/Beliefs)

*School of Studies in Religion, Woolley Building, University of Sydney, Sydney, NSW,*

*Australia*

**Arthur H. Westing** (Security/Agencies)

*Westing Associates, RFD 2, Box 330H, Putney VT 05346, USA*

**BOOK REVIEW EDITOR**

Nicholas Polunin Sr, 7 Chemin Taverney, 1218 Grand Saconnex, Geneva, Switzerland Tel: +41 22 7982383. Fax: +41 22 7982344.

**ADVISORY EDITORS**

**Reid A. Bryson** (Climate-land interactions) *Madison, USA*

**Paul R. Ehrlich** (Populations/Biology) *Stanford, USA*

**J. Ronald Engel** (Ethics/Philosophy) *Chicago, USA*

**Congbin Fu** (Climate change) *Beijing, China*

**José Goldemberg** (Energy production/use) *São Paulo, Brazil*

**Martin W. Holdgate** (Development/Environment) *Cambridge, UK*

**Patrick M. Holligan** (Marine biogeochemistry/Plankton) *Southampton, UK*

**Chi Yung Jim** (Biogeography/Urban ecology) *Hong Kong*

**Mohammed Kassas** (Desert ecology) *Giza, Egypt*

**Norman Myers** (Sustainable development) *Oxford, UK*

**Eric O. Odada** (Aquatic geology/Geochemistry) *Nairobi, Kenya*

**Nicholas Polunin Sr** (Biosphere conservation) *Geneva, Switzerland*

**José Sarukhán** (Systems/Population ecology) *Universidad Nacional Autónoma, Mexico*

**S.P. Singh** (Forest/Mountain ecology) *Nainital, India*

**Suresh K. Sinha** (Water resources) *New Delhi, India*

**G. Robin South** (Marine ecology) *Suva, Fiji*

**Christopher D. Stone** (Environmental law) *Los Angeles, USA*

**George M. Woodwell** (Forests/Land use) *Woods Hole, USA*

**SUBMISSION OF MANUSCRIPTS**

Manuscripts should be submitted to Dr N.V.C. Polunin, Department of Marine Sciences and Coastal Management, Ridley Building, University of Newcastle, Newcastle upon Tyne NE1 7RU, UK. Please consult the Instructions for Authors published in this issue of *Environmental Conservation*.

**SUBSCRIPTIONS**

*Environmental Conservation* (ISSN 0376-8929) is published four times a year in March, June, September and December. Four parts form a volume. The subscription price (excluding VAT) of Volume 23 (1996) (which includes postage) is £150 net (US\$260 in the USA, Canada and Mexico) for institutions; £68 net (US\$98 in the USA, Canada and Mexico) for individuals ordering direct from the publisher and certifying that the journal is for their personal use. Single parts are £40 (US\$68 in the USA, Canada and Mexico) plus postage.

Orders, which must be accompanied by payment, may be sent to a bookseller, subscription agent or direct to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, UK; or in the USA, Canada and Mexico: Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211, USA. EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Japanese prices for institutions (including ASP delivery) are available from Kinokuniya Company Ltd, PO Box 55, Chitose, Tokyo 156, Japan.

Copies of the journal for subscribers in the USA, Canada and Mexico are sent by air to New York to arrive with minimum delay. Second class postage paid at New York, NY, and at additional mailing offices.

Postmaster: send address changes in the USA, Canada and Mexico to: *Environmental Conservation*, Cambridge University Press, 110 Midland Avenue, Port Chester, New York, NY 10573-4930, USA.

Claims for missing issues should be made immediately on receipt of the subsequent issue.

**ADVERTISING**

Apply to the publisher. Address enquiries to: Rebecca Symons (UK) or the Advertising Co-ordinator (North America).

© Foundation for Environmental Conservation 1996

**COPYING**

This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA. Organizations in the USA who are also registered with C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of US Copyright law) subject to payment to C.C.C. of the per-copy fee of \$9.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0959-2598/96 \$9.00 + 0.10.

*ISI Tear Sheet Service*, 3501 Market Street, Philadelphia, PA 19104, USA, is authorized to supply single copies of separate articles for private use only.

Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions.

For all other use, permission should be sought from Cambridge or the American Branch of Cambridge University Press.

*Environmental Conservation* is covered by the major abstracting and indexing services including: Biological Abstracts, Current Advances in Ecological Sciences, Current Contents, Ecological Abstracts, Environment Index, Environmental Abstracts, Environmental Periodicals Bibliography, Excerpta Medica/EMBASE, Geographical Abstracts, Science Citation Index, World Agricultural Economics & Rural Sociology Abstracts.

Information on *Environmental Conservation* and all other Cambridge journals is available on <http://www.cup.cam.ac.uk/> and in North America on <http://www.cup.org/>.

This publication is printed on chlorine-free paper made with 75% recycled fibres.

Printed and bound by Bell and Bain Ltd., Glasgow