

BOARD OF EDITORS

DAVID DUFFY, Editor
School of Life Sciences, University of Hawai'i

ALLEN ALLISON
Bishop Museum

KENNETH Y. KANESHIRO
Department of Entomology
University of Hawai'i

DAVID R. CLEMENTS
Department of Biology
Western Trinity University
(British Columbia, Canada)

JOSEPH R. MOBLEY
Professor of Psychology
University of Hawai'i

SHEILA CONANT
School of Life Sciences
University of Hawai'i

CELIA M. SMITH
School of Life Sciences
University of Hawai'i

ROBERT H. COWIE
Center for Conservation
Research and Training
University of Hawai'i

ROBERT J. TOONEN
Hawai'i Institute of Marine Biology

LES WATLING
School of Life Sciences
University of Hawai'i

CURTIS C. DAEHLER
School of Life Sciences
University of Hawai'i

EDWARD WEBB
Department of Biological Science
National University of Singapore

© 2022 by University of Hawai'i Press

Pacific Science is a peer-reviewed journal that is published quarterly by University of Hawai'i Press in January, April, July, and October. It is the official journal of the Pacific Science Association.


Pacific Science is available in the BioOne.2 database of biology journals. For more details, contact BioOne or visit www.bioone.org. *Pacific Science* is also available through the Project MUSE collections at http://muse.jhu.edu/journals/pacific_science.

Annual subscription rates (2022) for institutions are \$110; for individuals, \$55. Single copies are \$30 for institutions, \$18 for individuals. Airmail delivery to non-U.S. addresses is \$48 per volume, \$12 for a single issue. Online subscriptions (all countries) \$55/individuals and \$110/institutions. Subscribe online at <https://www.uhpress.hawaii.edu/title/ps/>

Check or money order in U.S. funds drawn on a U.S. bank should be made payable to University of Hawai'i Press and sent to University of Hawai'i Press, Journals Department, 2840 Kolowalu St., Honolulu, Hawai'i 96822, USA. Claims for issues not received will be honored for 180 days from the date of publication; thereafter, the single-copy rate will be charged.

Back volumes of *Pacific Science* in 35 mm microfilm format may be purchased from Bell & Howell Information and Learning, 300 North Zeeb Rd., Ann Arbor, Michigan 48106, USA.

Postmaster: Send address changes to *Pacific Science*, 2840 Kolowalu St., Honolulu, Hawai'i 96822, USA.

 The paper used in this publication meets the minimum requirements of the American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

Visit the University of Hawai'i Press Journals website at www.uhpress.hawaii.edu/journals.

Cover: Adult Tinian Monarch in bamboo stand in north central Tinian on 15 August 2020. (Photo Copyright: N. Johnson)