

## Progress on Roads Well Traveled

Author: Beardsley, Timothy M.

Source: BioScience, 57(2) : 99

Published By: American Institute of Biological Sciences

URL: <https://doi.org/10.1641/B570201>

---

The BioOne Digital Library (<https://bioone.org/>) provides worldwide distribution for more than 580 journals and eBooks from BioOne's community of over 150 nonprofit societies, research institutions, and university presses in the biological, ecological, and environmental sciences. The BioOne Digital Library encompasses the flagship aggregation BioOne Complete (<https://bioone.org/subscribe>), the BioOne Complete Archive (<https://bioone.org/archive>), and the BioOne eBooks program offerings ESA eBook Collection (<https://bioone.org/esa-ebooks>) and CSIRO Publishing BioSelect Collection (<https://bioone.org/csiro-ebooks>).

Your use of this PDF, the BioOne Digital Library, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](http://www.bioone.org/terms-of-use).

Usage of BioOne Digital Library content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne is an innovative nonprofit that sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

**PUBLISHER**  
Richard T. O'Grady

**EDITOR IN CHIEF**  
Timothy M. Beardsley

**SENIOR EDITOR**  
Donna Daniels Verdier

**PRODUCTION MANAGER / ART DIRECTOR**  
Herman Marshall

**PUBLICATIONS ASSISTANT**  
Jennifer A. Williams

**Editors:** Eye on Education: Susan Musante (educationoffice@aibs.org); Feature articles: Cathy Lundmark (features@aibs.org); Washington Watch: Robert E. Gropp (publicpolicy@aibs.org).

**Editorial Associate:** Barbara J. Orton.

**Editorial Board:** Agriculture: Sonny Ramaswamy; Animal Behavior: Janice Moore; Animal Development: Paula Mabey; Botany: Gregory J. Anderson; Cell Biology: Randy Wayne; Ecology: Scott Collins, Daniel Simberloff; Ecotoxicology: Judith S. Weis; Education: Gordon E. Uno; Environmental Policy: Gordon Brown, J. Michael Scott; Evolutionary Biology: James Mallet; Genetics and Evolution: Martin Tracey; History and Philosophy: Richard M. Burian; Invertebrate Biology: Kirk Fitzhugh; Landscape Ecology: Monica Turner; Microbiology: Edna S. Kaneshiro; Molecular Biology: David Hillis; Molecular Evolution and Genomics: David Rand; Neurobiology: Cole Gilbert; Plant Development: Cynthia S. Jones; Policy Forum: Eric A. Fischer; Population Biology: Ben Pierce; Professional Biologist: Jean Wyld; Sensing and Computation: Geoffrey M. Henebry; Vertebrate Biology: Harvey B. Lillywhite.

**Editorial Correspondence:** 1444 I Street, NW, Suite 200, Washington, DC 20005; telephone: 202-628-1500; fax: 202-628-1509; e-mail: bioscience@aibs.org. Instructions for preparing a manuscript for *BioScience* can be found at [www.aibs.org/bioscience/resources/Info\\_for\\_contribs.pdf](http://www.aibs.org/bioscience/resources/Info_for_contribs.pdf).

**Advertising:** For information on both display and line classified advertisements and deadlines, contact John Rasanen, American Geological Institute; telephone: 703-379-2480, ext. 224; fax: 703-379-7563; e-mail: jrasanen@aibs.org.

*BioScience* (ISSN 0006-3568) is published monthly except July/August combined by the American Institute of Biological Sciences. To subscribe, call 1-800-992-2427, ext. 29. Individual membership: sustaining, \$90/yr; individual, \$70/yr; family, \$90/yr (includes \$36 for *BioScience*); emeritus, \$50/yr; K-12 teacher/administrator, \$45/yr (includes \$22 for *BioScience*); graduate and postdoctoral students, \$40/yr (includes \$21 for *BioScience*); undergraduate and K-12 students, \$20/yr (includes \$15 for *BioScience*); lifetime, \$1400 (one-time fee). Institutional subscriptions: domestic, \$337/yr; foreign, \$404/yr. Single copies: \$14 plus shipping and handling for up to 20 copies; volume discounts available for more than 20 (call 1-800-992-2427, ext. 29). Subscription renewal month is shown in the four-digit year-month code in the upper right corner of the mailing label.

© 2007 American Institute of Biological Sciences. All rights reserved. Periodical postage paid at Washington, DC, and additional mailing offices.

**POSTMASTER:** Send address changes to *BioScience* Circulation, AIBS, 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101. Printed in USA. AIBS authorizes photocopying for internal or personal use, provided the appropriate fee is paid directly to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923; telephone: 978-750-8400; fax: 978-750-4744; Web site: [www.copyright.com](http://www.copyright.com).

To photocopy articles for classroom use, request authorization, subject to conditions thereof, from the Academic Permissions Service at CCC. Each copy must say "© [year] by the American Institute of Biological Sciences." Statements and opinions expressed in *BioScience* are those of the author(s) and do not necessarily reflect the official positions of the American Institute of Biological Sciences, the editors, the publisher, or the institutions with which the authors are affiliated. The editors, publisher, and AIBS disclaim any responsibility or liability for such material.

# BioScience

## Organisms from Molecules to the Environment

American Institute of Biological Sciences

### Progress on Roads Well Traveled

**A**nimal migration fascinated the ancients and continues to fascinate researchers today. An often highly complex, synchronized suite of changes in behavior, morphology, and physiology enables journeys that may be epic in scale. These feats of endurance and navigation, which often beggar belief, are widely—and correctly—regarded as some of the most astonishing of nature's spectacles. Researchers have gained some important insights into the evolution of migration, yet very much remains unknown about the multiple mechanisms that animals call on when they migrate.

These facts are reason enough to devote much of this issue of *BioScience* to a special section on animal migration. But there are at least three additional reasons. One is that as new capabilities resulting from the revolution in molecular biology diffuse outward, phenomena such as migration are becoming increasingly susceptible to analysis in genetic and even molecular terms. A second is recent advances in tracking technologies, ranging from isotope analysis for identifying locations an animal has visited to miniaturization of transmitters and receivers.

Another reason for a special section on migration is perhaps more urgent. Global warming is changing the timing of bud bursts and myriad other cyclical processes that provide food for wildlife, and driving many birds and insects to move their ranges. In some birds, warming may favor shorter migration distances, but the complexity of migration is such that trying to predict the consequences for species in general borders on the impossible. Yet try we must, because only by obtaining a clearer picture of how migration really works will we be able to plan strategies for mitigating the effects of warming.

*BioScience's* special section on animal migration was coordinated by Hugh Dingle and V. Alistair Drake. They have brought together a distinguished group of authors. Dingle and Drake (p. 113) provide the broadest generalizations about the nature of migration, which can be seen as an adaptation to fluctuating resources. Åkesson and Hedenström (p. 123) describe experimental approaches to the question of how migrants achieve their navigations, and suggest that future research will need to investigate a range of natural cues. Ramenofsky and Wingfield (p. 135) describe morphological and physiological adaptations involved in seasonal migrations. They note that the control mechanisms that regulate migration and coordinate it with local conditions are largely unknown, and that the potential for disruption by climate change is great. Cheke and Tratalos discuss some of the complexities of migration for two African pest species (red-billed queleas and desert locusts) in the article that begins on p. 145: They argue that predicting the details of future ecological changes will call for greater understanding of the population dynamics and genetic composition of many organisms. Roff and Fairbairn (p. 155) describe the genetic architecture of several components of the migratory syndrome in the sand cricket, *Gryllus firmus*. And Pulido, in the article that starts on p. 165, shows how genetic correlations among migratory traits and with other traits are likely to play a major role in determining evolutionary change. The section thus provides a valuable survey of expert views on a range of aspects of this pervasive and vital syndrome.

TIMOTHY M. BEARDSLEY  
Editor in Chief

doi:10.1641/B570201  
Include this information when citing this material.