

Ecological Restoration

Volume 35 ■ Number 4 | December 2017



Hopes and Heartaches at Native Plant Nurseries

ENVIRONMENTAL ETHICS



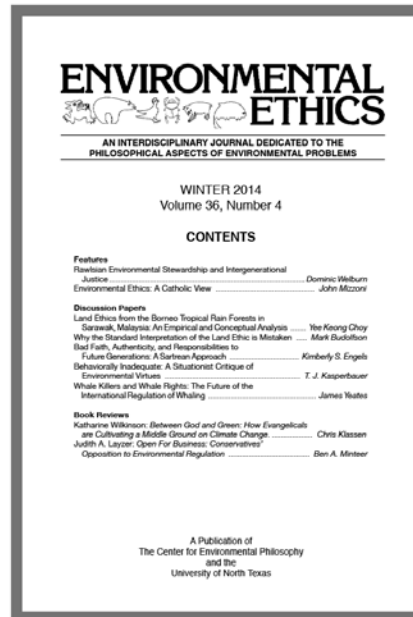
AN INTERDISCIPLINARY JOURNAL DEDICATED TO THE
PHILOSOPHICAL ASPECTS OF ENVIRONMENTAL PROBLEMS

Environmental Ethics is intended as a forum for diverse interests and attitudes, and seeks to bring together the nonprofessional environmental philosophy tradition with the professional interest in the subject.

**AVAILABLE IN
PRINT OR ONLINE!**

The online subscription is searchable and includes all issues from volume 1 (1979) in PDF format from the PHILOSOPHY DOCUMENTATION CENTER.

The print subscription is four-issues (512 pages) from the CENTER FOR ENVIRONMENTAL PHILOSOPHY.



Published by the **Center for Environmental Philosophy**
www.cep.unt.edu

Print subscription price per volume, anywhere in the world:
Individuals, \$40; Institutions, \$80

Subscribe at <http://www.cep.unt.edu/enethics.html> or mail to:
Environmental Ethics, Center for Environmental Ethics
University of North Texas
1155 Union Circle #310980
Denton, TX 76203-5017

Questions? Contact us at:
940-565-2727
FAX 950-565-4439
ee@unt.edu



 **Philosophy
Documentation
Center**
<https://secure.pdcnet.org>

Online Subscriptions:

Individuals
Online only (single user): \$90

Campus-Wide License for Institutions
Online only (5 simultaneous users): \$216

EDITORIAL

Growing Pains: Hopes and Heartaches at Native Plant Nurseries

Steven N. Handel

PERSPECTIVE

Forest Landscape Restoration:

Progress in the Last Decade and Remaining Challenges

Stephanie Mansourian, Nigel Dudley and Daniel Vallauri

RESTORATION NOTES

Furrows as Centers of Restoration in Old Fields of Renosterveld, South Africa

Sheunesu Ruwanza

Regional Genetic Differences in Forest Herbaceous Species

Catherine M. Mabry

Germination Characteristics of a Native Non-Indigenous Prairie Forb
in Prairie Plantings

Alexander C. Rischette and Jack E. Norland

Japanese Knotweed Management in the Riparian Zone of the Bronx River

*Christopher Haight, Sarah Lumban Tobing, Jessica A. Schuler, Marit Larson,
Kathleen McCarthy, Robin Kriesberg, Ferdie Yau and Matthew I. Palmer*

ARTICLES

Weed Establishment and Persistence after Water Pipeline Installation
and Reclamation in the Mixed Grass Prairie of Western North Dakota

Erin K. Espeland and Lora B. Perkins

Soils Determine Early Revegetation Establishment with and without
Cover Crops in Northern Mixed Grass Prairie after Energy Development

*Erin K. Espeland, John Hendrickson, David Toledo, Natalie M. West and
Tatyana A. Rand*

Removing Invasive *Lonicera maackii* and Seeding Native Plants
Alters Riparian Ecosystem Function

Kristine N. Hopfensperger, Richard L. Boyce and Devin Schenk

Short-Term Response of Vegetation and the Riparian Bird Community
to Dam Removal on the Rogue River, Oregon

Jaime L. Stephens

Long-term Outcomes of Natural-Process Riparian Restoration on a Regulated
River Site: The Rio Grande Albuquerque Overbank Project after 16 Years.

*Esteban H. Muldavin, Elizabeth R. Milford, Nancy E. Umbreit and
Yvonne D. Chauvin*

Techniques to Restore Coastal Scrub at a Reclaimed Quarry
in Central California

*Max J. Busnardo, Charles D. McClain, Kaitlin M. Schott, Matt B. Quinn and
Matt J. Pollock*



Ecological Restoration

Volume 35, Number 4



December 2017

Editorial	279
Growing Pains: Hopes and Heartaches at Native Plant Nurseries <i>Steven N. Handel</i>	
Perspective	281
Forest Landscape Restoration: Progress in the Last Decade and Remaining Challenges <i>Stephanie Mansourian, Nigel Dudley and Daniel Vallauri</i>	
RESTORATION NOTES	
Furrows as Centers of Restoration in Old Fields of Renosterveld, South Africa <i>Sheunesu Ruwanza</i>	289
Regional Genetic Differences in Forest Herbaceous Species <i>Catherine M. Mabry</i>	291
Germination Characteristics of a Native Non-Indigenous Prairie Forb in Prairie Plantings <i>Alexander C. Rischette and Jack E. Norland</i>	296
Japanese Knotweed Management in the Riparian Zone of the Bronx River <i>Christopher Haight, Sarah Lumban Tobing, Jessica A. Schuler, Marit Larson, Kathleen McCarthy, Robin Kriesberg, Ferdie Yau and Matthew I. Palmer</i>	298
ARTICLES	
Weed Establishment and Persistence after Water Pipeline Installation and Reclamation in the Mixed Grass Prairie of Western North Dakota <i>Erin K. Espeland and Lora B. Perkins</i>	303
Soils Determine Early Revegetation Establishment with and without Cover Crops in Northern Mixed Grass Prairie after Energy Development <i>Erin K. Espeland, John Hendrickson, David Toledo, Natalie M. West and Tatyana A. Rand</i>	311
Removing Invasive <i>Lonicera maackii</i> and Seeding Native Plants Alters Riparian Ecosystem Function <i>Kristine N. Hopfensperger, Richard L. Boyce and Devin Schenk</i>	320
Short-Term Response of Vegetation and the Riparian Bird Community to Dam Removal on the Rogue River, Oregon <i>Jaime L. Stephens</i>	328
Long-term Outcomes of Natural-Process Riparian Restoration on a Regulated River Site: The Rio Grande Albuquerque Overbank Project after 16 Years. <i>Esteban H. Muldavin, Elizabeth R. Milford, Nancy E. Umbreit and Yvonne D. Chauvin</i>	341
Techniques to Restore Coastal Scrub at a Reclaimed Quarry in Central California <i>Max J. Busnardo, Charles D. McClain, Kaitlin M. Schott, Matt B. Quinn and Matt J. Pollock</i>	354

ABSTRACTS

Climate Change	362	Reclamation, Rehabilitation & Remediation	365
Coastal & Marine Communities	362	Species at Risk	366
Ecological Literacy	363	Technology & Tools	366
Economics & Ecosystem Services	363	Traditional & Local Knowledge	366
Grasslands	364	Urban Restoration	367
Invasive & Pest Species	364	Wetlands	368
Lakes, Rivers & Streams	365	Wildlife Habitat Restoration	368
Monitoring & Adaptive Management	365	Woodlands	368
Outreach	365		

MEETINGS

369



Front Cover Feature: The need for abundant and appropriate seeds of native plants has encouraged some native plant nurseries to develop their own populations of wildflower and grass species that are regularly requested by clients. These fields in central New Jersey have been developed by Pinelands Nursery & Supply, Columbus, NJ, to provide local genotypes to restoration projects in the region. Irregular ordering, changing preferences, and the challenges of knowing the reproductive ecology of many species all challenge the ability of these nurseries to quickly expand supplies to meet fluctuating demands. These expansive fields are open-pollinated and were started with accessions from several local populations to build genetic diversity. Special seed collection and cleaning facilities are then needed to meet the needs of restoration practitioners. Photo credit: Steven N. Handel.

Back Cover Features:

Top: To effectively restore degradation of the landscape due to the rapid boom in energy development, an understanding of both the role of soils and weed invasion is necessary. In this issue, Espeland and colleagues test the role of cover crops in ecosystem recovery after energy development and the potential for dispersed reclamation activities to facilitate weed invasion and spread. Photo credit: Erin K. Espeland.

Middle: Understanding the appropriate collection zones for native plants used in restoration activities is a key concept for successful restoration. Pictured here, thimbleweed, cup plant, downy wild rye, and American bellflower growing in greenhouses at Iowa State University. Photo credit: Catherine M. Mabry.

Bottom: To restore coastal scrub communities on mined sites, Busnardo and colleagues found that seeding these communities on amended soils was more successful than container plantings. Pictured here, Leona Quarry reclamation and coastal scrub restoration project site, central California, USA, after completion of mass grading and topsoil preparation. Photo Credit: Karen Verpeet.

EDITORIAL BOARD

Scott Abella

Natural Resource Conservation LLC,
Boulder City, USA.

Steven I Apfelbaum

Applied Ecological Services, Wisconsin, USA.

James Aronson

Centre for Evolutionary and Functional Ecology
Lab, Montpellier, France.

Paulette Bierzychudek

Department of Biology, Lewis & Clark College,
Portland OR, USA.

Peter Bowler

Department of Ecology and Evolutionary
Biology, University of California, Irvine, USA.

Lindsay Campbell

USDA Forest Service Northern Research Station,
NY, USA.

Robin L. Chazdon

Department of Ecology and Evolutionary
Biology, University of Connecticut, USA.

Francisco A. Comín Sebastián

Pyrenean Institute of Ecology-CSIC, Spain.

David Drake

Department of Forest and Wildlife Ecology,
University of Wisconsin–Madison, USA.

Erin Espeland

USDA-ARS Pest Management Research Unit,
Sidney MT, USA.

Bram Gunther

New York City Urban Field Station, New York
City Department of Parks & Recreation, Bayside,
New York, USA.

Jason Hall

National Oceanic and Atmospheric Administration's
Northwest Fisheries Science Center Mukilteo
Research Station, Seattle WA, USA.

Emily Huff

Department of Forestry, Michigan State
University East Lansing MI, USA.

Francine Hughes

Department of Life Sciences,
Anglia Ruskin University, Cambridge, UK.

Basil Iannone

School of Forest Resources and Conservation,
University of Florida, Gainesville FL, USA.

Michelle Johnson

New York City Urban Field Station, USDA Forest
Service, Bayside, New York, USA.

Holly Jones

Department of Biological Sciences,
Northern Illinois University, USA.

Kristen Kaczynski

Department of Geological and Environmental
Sciences at California State University, Chico
CA, USA.

Kristy King

Natural Areas Restoration & Management
Forestry, Horticulture & Natural Resources,
New York City Department of Parks &
Recreation, Long Island City, New York, USA.

Roger Mann

Virginia Institute of Marine Science, USA.

Márcia C.M. Marques

Department of Botany, Universidade Federal do
Paraná, Curitiba, Brazil.

Jill McGrady

Great Ecology Inc., La Jolla CA, USA.

David Moreno-Mateos

Basque Center for Climate change–BC3,
Basque Country, Spain.

Andrew Rayburn

Independent Consulting Ecologist, Davis, USA.

Carrie Reinhardt Adams

Environmental Horticulture Department,
University of Florida, Gainesville, USA.

David J. Robertson

Pennypack Ecological Restoration Trust,
Philadelphia PA, USA

Ted Shear

Department of Forestry and Environmental
Resources, North Carolina State University,
Raleigh, North Carolina, USA.

Greg Spyreas

Illinois Natural History Survey, USA.

Katharine Suding

Department of Ecology & Evolutionary Biology,
University of Colorado Boulder, Boulder, USA.

Alan Unwin

School of Environmental and Horticultural
Studies, Niagara College, Canada.

Dennis Whigham

Smithsonian Environmental Research Center,
USA.

Ken Yocom

Department of Landscape Architecture,
University of Washington, USA.

Kathryn Yurkonis

Department of Biology, University of North
Dakota, Grand Forks, North Dakota, USA.

Luis Zambrano González

Biology Institute, National Autonomous
University of Mexico (UNAM), Mexico.

JOURNAL STAFF

Editor: Steven N. Handel

Associate Editor: Myla F.J. Aronson

Editorial Assistant: Paulina A. Arancibia

Abstracts Editors: Elena S. Tartaglia

Abstracts Authors: Elena S. Tartaglia, Paulina A.
Arancibia and Max R. Piana

Copy Editor: Kate D. Douthat

Rutgers, The State University of New Jersey

School of Environmental and Biological
Sciences: Robert M. Goodman, Executive Dean

Society for Ecological Restoration International:
Alan Unwin, Chair



Printed on 30% recycled text paper.

Ecological Restoration is published quarterly by the University of Wisconsin Press. © by the Board of Regents of the University of Wisconsin System. No part of this publication may be reproduced without the written consent of the publisher, University of Wisconsin Press. Requests for permission to reprint an article or illustration should be made directly to UW Press, 1930 Monroe St, 3rd Floor, Madison, WI 53711-2059, permissions@uwpress.wisc.edu, er.uwpress.org.

Contributions are welcome. Authors should upload their materials through *Ecological Restoration's* submission website, which can be found at er.uwpress.org. Submission guidelines can be found at uwpress.wisc.edu/journals/journals/er_submissions.html.

Authorization to reproduce material from this journal, beyond one copy for personal use or that permitted by Sections 107 and 108 of U.S. Copyright Law, is granted for a fee. For fee schedule and payment information, contact www.copyright.com; The Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, 978/750-8400, Fax: 978/750-4470.

Ecological Restoration is indexed in Elsevier BIOBASE, AGRICOLA, and in CSA's Ecology databases.

Ecological Restoration is affiliated with the Society for Ecological Restoration, 1017 O St. NW, Washington, DC 20001, 202/299-9518, ser.org. Members of the Society for Ecological Restoration receive *Ecological Restoration* at a discounted rate. Please visit the UW Press Web site at uwpress.wisc.edu/journals for more information.

Ecological Restoration was founded at the University of Wisconsin–Madison Arboretum.

Advertising: Call 608/263-0534 for current rates. Advertisements or references to products by brandname or trademark do not imply an endorsement by the editors or publishers of this journal.

Ecological Restoration (ISSN 1522-4740, E-ISSN 1543-4079) is published quarterly by the University of Wisconsin Press, 1930 Monroe Street, 3rd Floor, Madison, WI 53711-2059. Periodicals postage paid at Madison WI and at additional mailing offices.

Subscriptions: Individual (please pre-pay), \$75 print and electronic, \$64 electronic only; \$45 students; \$165 businesses and nongovernmental organizations; libraries and government agencies, \$289 print and electronic, \$254 electronic only. Non-U.S. subscribers please add \$40 for foreign shipping. All correspondence regarding subscriptions, advertising, and related matters should be sent to Journals Division, 1930 Monroe Street, 3rd Floor, Madison, WI 53711-2059, USA; uwpress.wisc.edu/journals. Members of the Society for Ecological Restoration receive *Ecological Restoration* at a discounted rate.

Please visit our Web site at uwpress.wisc.edu/journals for more information.

POSTMASTER: Send address changes to *Ecological Restoration*, 1930 Monroe Street, 3rd Floor, Madison, WI 53711-2059.

Submissions

We welcome submissions to *Ecological Restoration* from any part of the world. Submissions should relate to the restoration of plants, animals, ecological communities, or landscapes. We understand ecological restoration to be a multidisciplinary and diverse effort and welcome manuscripts considering ecological, and social aspects of restoration, as well as political, economic, legal, and regulatory issues, and other subjects related to ecological restoration. Relevant topics also include techniques and tools for planning, site preparation, species introduction, undesired species control, and monitoring. Manuscripts dealing with plant or animal community composition or general ecology must relate the work explicitly to ecological restoration practice and theory. Similarly, material dealing with reclamation or rehabilitation in a broader sense, or with restoration for economic purposes—economic forestry, range management, waste disposal—must be connected to ecological restoration.

Material may be submitted for the following categories (listed as they are encountered in the Journal):

1. Perspectives
2. Restoration Notes (shorter items, < 1500 words describing project updates, events, innovative technologies, preliminary or unusual findings, thought-provoking concepts, imaginative solutions, commentary, policy reports, etc.)
3. Research articles or reviews on ecological restoration theory, experiments, socio-ecological linkages, education, restoration history, practice
4. Case studies (full length articles describing a particular restoration project or location and lesson learned)
5. Book, journal, website, or movie reviews

Authors of full-length articles or reviews should submit their material online at er.msubmit.net. Manuscripts must be submitted with a cover letter stating that the material has not been previously published, and has not been submitted elsewhere and will not be until a final decision has been reached by the editor. Questions about the online submission site, or general inquiries may be emailed to ERjournal@aesop.rutgers.edu.

Review and Editing Process

Manuscripts are reviewed externally by experts in the field. The process requires approximately four to six months. Restoration Notes are reviewed and edited in-house unless additional expertise is required to evaluate the submission.

Style

Practitioners of ecological restoration are both a core audience and source of contributions to *ER*. Contributors should use a straightforward style free of unnecessary technical terms and jargon. We prefer the active voice (for example, “We measured three trees” instead of “Three trees were measured”). Please see our Submission Guidelines at er.uwpress.org for more information.

Tables, Photos, and Illustrations

Table and Figure captions should include useful and detailed information, and should be independent of the text. Figures will be reproduced in black and white in the print version of *Ecological Restoration* (usually requiring higher contrast) and can be reproduced in color in the online version. We use color photos on the front and back covers of the journal and welcome submissions of eye-catching, informative, high-quality photographs.

Page Charges

Payment of \$50 per page is requested from authors with research grant or other institutional funds available to underwrite publication costs. Invoices will be sent after composition of pages. Authors with no grant or institutional funds do not need to pay publication costs. Ability to pay page charges is not a condition for acceptance of a manuscript.