

Ecological Restoration

Volume 37, Number 3



September 2019

In Memory of Erin K. Espeland 139
Myla F.J. Aronson

Editorial 140
The Living Dead and the Practice of Landscape Restoration
Steven N. Handel

RESTORATION NOTES

Caloric Values of Selected Wetland and Coastal Sage Scrub Vascular Plant Seeds 142
Peter A. Bowler, Jenny Liou and Jocelyn Moon

Promoting Change in Common Tern (*Sterna hirundo*) Nest Site Selection 143
to Minimize Construction Related Disturbance
Peter C. McGowan, Jeffery D. Sullivan, Carl R. Callahan, William Schultz, Jennifer L. Wall and Diann J. Prosser

Mycorrhizae and Root Morphology in Potted and Wild *Artemisia californica* and *Eriogonum fasciculatum* 148
Christopher.M. Gunawan and Peter A. Bowler

ARTICLES

Arbuscular Mycorrhizal Fungi in the Rhizosphere of Saplings Used 152
in the Restoration of the Rupestris Grassland
Etiene Silva Coutinho, Wallace Beiroz, Milton Barbosa, João Henrique de Azevedo Xavier and G. Wilson Fernandes

Five Decades of Wetland Soil Development of a Constructed Tidal Salt Marsh, North Carolina, USA 163
Aaron Noll, Courtney Mobilian, and Christopher Craft

An Adaptive Managed Retreat Approach to Address Shoreline Erosion 171
at the Kennedy Space Center, Florida
M. Rebecca Bolt, Mark A. Mercadante, Timothy J. Kozusko, Stephanie K. Weiss, Carlton R. Hall, Jane A. Provanha, Naresa R. Cancro, Tammy E. Foster, Eric D. Stolen and Scott A. Martin

Restoration of Society-Nature Relationship Based on Education: 182
A Model and Progress in Patagonian Drylands
Daniel Roberto Pérez, Florencia del Mar González, María Emilia Rodríguez Araujo, Daniela Ailín Paredes and Elsa Meinardi

Biocultural Species Enhancement in the Archaeological Site of Tzintzuntzan, 192
the “Place of Hummingbirds”
Marina Barajas-Arroyo, Brenda Brown, José Luis Punzo, Jorge E. Schondube, Ian MacGregor-Fors and Roberto Lindig-Cisneros

ABSTRACTS

Climate Change	199	Propagation & Introduction	202
Coastal & Marine Communities	199	Reclamation, Rehabilitation, & Remediation	203
Ecological Design	200	Species at Risk	203
Economics & Ecosystem Services	200	Technology & Tools	203
Grasslands	201	Traditional and Local Knowledge	204
Invasive & Pest Species	201	Urban Restoration	204
Lakes, Rivers, & Streams	201	Wetlands	204
Monitoring & Adaptive Management	202	Wildlife Habitat Restoration	204
Planning and Policy	202	Woodlands	205

MEETINGS 206



Erratum for Vol. 37, No. 1, 2019

For the front cover image, the photo was incorrectly labeled as being located in Minnesota, but should have been labeled as a site in Illinois. We apologize for any inconvenience.

Front Cover Feature: Since 1999, erosion along the Kennedy Space Center coastline in Florida has increased as a result of frequent storm surges. To protect valuable national assets and infrastructure at the site, a system of created dunes has been installed. In a case study, Bolt et al. document how these created dunes have benefitted two protected wildlife species: *Gopherus polyphemus* (gopher tortoise, whose footprints are pictured here) and *Peromyscus polionotus niveiventris* (southeastern beach mouse). Image credit: Rebecca Bolt

Back Cover Features:

Top: Marshes are often nitrogen limited even though sufficient nitrogen (N) and carbon (C) are critical to sustain plant productivity and support biogeochemical processes such as decomposition and denitrification in these systems. Noll et al. examined the development of wetland soils over five decades in a constructed salt marsh. Their findings help restoration ecologists identify target soil properties such as bulk density, C, N, and C:N, for gauging wetland restoration success and estimating the time frame necessary for recovery. Image credit: Christopher Craft.

Middle: In the arid and semiarid regions of Patagonia, Argentina, millions of hectares have been desertified by cattle ranching and hydrocarbon extraction activities. Restoring habitat in this region is a large undertaking that requires cooperation among diverse landholders. Through a case study, Pérez et al. present a multi-step and multi-year model for Environmental Education (EE) developed to engage stakeholders in ecological restoration. As a result of the EE process, residents worked cooperatively with government and industry to establish native species nurseries and revegetate degraded lands. Image credit: Daniel Pérez.

Bottom: Biocultural restoration aims to reestablish both the ecological and cultural components at a site. Hummingbirds have been a culturally relevant wildlife group in Mexico since pre-Columbian times but are absent from many cultural heritage sites due to ecological degradation. To help re-establish a connection between people and their cultural and natural heritage, Barajas-Arroyo et al. conducted biocultural species enhancement at an archaeological site. They report on vegetation parameters necessary to attract target hummingbird species, and document how this enhancement has impacted visitor experiences at the site. Image credit: Roberto Lindig-Cisneros