

## Letter from SER Executive Director Bethanie Walder

Dear SER Members,



Did you know that SER has a [code of ethics](#)? We do, and it's a core part of who we are as an organization. Ecological restoration, by definition, raises numerous ethical issues. SER defines ecological restoration as, "the practice of assisting the recovery of an ecosystem that is damaged, degraded, or destroyed." As soon as we begin to design, let alone implement, ecological restoration, we are faced with numerous ethical questions, for example: what damage, degradation or destruction has occurred; what type of, and how much assistance is appropriate; what goals to define for the project and whether those are aimed at "returning" an area to its natural trajectory, or not; and how the impacts of climate change might affect restoration.

In addition to these questions, the final bullet in our code of ethics raises yet another ethical concern related to ecological restoration projects: "Because ecological restoration sometimes involves causing harm (e.g., removal of invasive species) to achieve greater ecological benefits, we believe difficult choices should be acknowledged, aired and undertaken with care."

As SER members, we know that you deal with these difficult choices and other ethical questions on a regular basis. Thus, the theme of this issue of *SERNews* is focused on ethical issues within the field of ecological restoration. We cannot and do not try to cover every ethical issue in the four featured articles, but they do cover a variety of ethical topics, ranging from the foundations of ecological restoration to SER's recently approved ethical guidelines for corporate sponsorships.

For example, in his article, "Ethics and Restoration: A Fascinating and Vexing Time," SER Board member Dan Spencer does a fabulous job walking readers through some of the complex ethical debates that have challenged restoration ecologists, beginning with philosopher Robert Elliot's "Restoration Thesis." He then moves on to Eric Katz's argument that restoration further illustrates human efforts to dominate nature. As Spencer states in his article, "These critiques did not go unchallenged. Andrew Light drew an important distinction between 'malicious' restorations – those that fit the restoration thesis and are used to justify further degradation of natural places, and 'benevolent' restorations where we take responsibility for previous ecological harms."

Spencer's article continues by providing a very interesting take on the highly controversial question of novel ecosystems and the ethical questions it raises. He clearly and succinctly articulates the differing opinions in the novel ecosystems debates and closes with his personal views on how we should move forward.

Following Spencer's introduction is a thought-provoking article by Colorado College philosopher Marion Hourdequin addressing the uncommon challenges of restoration of former military sites. Among other specialties, Hourdequin has spent several years assessing the reclamation/restoration of such lands to more natural conditions. Hourdequin points out that many former military lands were long off limits to the public and experienced only very limited development, so they provide a paradoxical combination of high quality wildlife habitat alongside/inside severely contaminated landscapes and water sources. This article includes several compelling examples of such landscapes, and asks "how might one approach restoration and ongoing management of a site like this, with its bewildering juxtaposition of contamination and ecological richness?" She also raises the social histories of these places and the important intersection between the social and the ecological, "...it can be helpful to understand these areas as layered landscapes, calling attention to the ways in which their uses, their meanings, and their ecologies have changed over time, and how prior uses, meanings, and ecologies shape possibilities for the future (Hourdequin and Havlick 2016)." SER, as an organization, often struggles to connect the social with the scientific. Hourdequin's examples remind us of how important it is for us to continue to make these important connections. If Hourdequin's article inspires you, you can learn more by reading "Restoring Layered Landscapes," a 2015 book on this topic edited by Hourdequin and David Havlick. In addition, we'd also like to thank Dr. Hourdequin for presenting on this topic at SER's Central Rockies Chapter symposium.

In our third thematic piece, Lillian Pearce and Ella Furness discuss restoration as an act of gift giving. Pearce and Furness claim that by engaging in restoration we are creating a "reciprocal relationship with nature." They argue that "participatory ecological restoration practices... provide alternatives to dominant contemporary narratives of crisis, fear and commodification, and nurture relationships between people and place through change." While we often note that SER has members from many different types of academic and practical backgrounds, this article from Pearce and Furness reminds us of the diversity of thought within the field of restoration. Their article asks us to perceive the relationship between humans and nature –especially as practiced through restoration – through a different set of filters.

The final thematic article in this issue of *SERNews* comes from two of Dan Spencer's graduate students from the University of Montana. Tom Sentner and Lindsay Wancour spent the spring 2016 semester working with SER to develop ethical guidelines for SER to use when considering corporate sponsorships for our organization and/or for our conferences. At SER's June 2016 board meeting, the board adopted their proposal as official guidance for the organization. We're delighted to share that guidance here, including the decision tree they developed to help SER and our regional Chapters consider corporate sponsorship opportunities in an ethically responsible way. Their work draws heavily from concepts about "the restoration thesis" and malicious and benevolent restoration addressed by Spencer in his opening article.

Like the field of ecological restoration itself, the environmental ethics of restoration are dynamic and fluid as we face new and more significant challenges to implement our work. As such, we

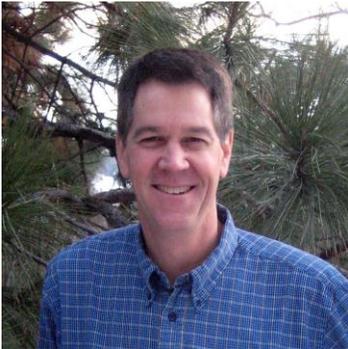
hope you find these articles not only thought-provoking, but applicable to your daily work in restoration. Thanks to all of the authors for their time and energy to put together these articles.

Happy Reading,



## Ethics and Restoration: A Fascinating and Vexing Time

Contributed by Dan Spencer, Professor of Environmental Studies, University of Montana



### *Early debates on ethics and restoration*

Thinking about ethical issues associated with restoration predates the founding of SER in 1987. Some thirty-five years ago, the Australian philosopher Robert Elliot startled the nascent field of restoration by accusing it of being a “Trojan Horse” for industry (Elliot 1982). Calling the issue “the restoration thesis,” Elliot observed how industry was already using the promise of restoration as justification for further exploitation of natural areas. For industry, restoration created a perfect win-win scenario: we can extract valuable natural resources from wild places – from minerals to old growth trees – and restoration then provides a means to restore places to as good as new.

Other philosophers, such as Eric Katz, went even further in their criticism of restoration as antithetical to environmental ethics. Calling restoration “the Big Lie,” Katz argued that restoration was simply the latest manifestation of human domination of nature: “A ‘restored’ nature is an artifact created to meet human satisfaction and interests. Thus, on the most fundamental level, it is an unrecognized manifestation of the insidious dream of the human domination of nature. Once and for all, humanity will demonstrate its mastery of nature by ‘restoring’ and repairing the degraded ecosystems of the biosphere. Cloaked in an environmental consciousness, human power will reign supreme (Katz 1992).”

These critiques did not go unchallenged. Andrew Light drew an important distinction between “malicious” restorations – those that fit the restoration thesis and are used to justify further degradation of natural places, and “benevolent” restorations where we take responsibility for *previous* ecological harms. Here, we restore ecological integrity with fidelity to historical antecedents in order to allow wild or natural places to *return* to their historical trajectories and evolve in the future unimpeded by human interference (Light 2000). Eric Higgs developed a model for *good* restoration that combined the keystone concepts of ecological integrity and historical fidelity with opportunities for community engagement (“focal” restoration) and returning *wildness* to degraded landscapes (Higgs 2003).

Informed by these debates, restoration developed into a robust field, guided for several decades by the standard of using reference ecosystems to restore degraded lands to the historical trajectory these lands presumably would have evolved within had they not experienced human disturbances. Hence ecological integrity, guided by fidelity to historical conditions, largely set the

framework for restoration as the gold standard for land management, and distinguished it from other practices with anthropocentric ends such as reclamation or rehabilitation. Underlying restoration was the implicit belief that ecologically intact landscapes and indigenous ecosystems have value – both value to humans for the ecosystem services they provide, but also value in and of themselves as “natural” places that had evolved free from human manipulation. Whereas practices such as reclamation and rehabilitation were guided by explicitly anthropocentric goals to benefit human communities, restoration implied a deeper, perhaps biocentric or ecocentric orientation that valued indigenous ecosystems for their own sake.

### *Emerging ethical issues in restoration*

As our world moves into the Anthropocene, where collectively humankind has become a planetary ecological and geological force, several new circumstances challenge the feasibility of using ecological integrity and historical fidelity to set the baseline for restoration, at least in some circumstances. These circumstances in turn raise difficult and vexing ethical issues about what we *should* be doing.

Climate change and global warming are rapidly shifting local weather patterns and seasons beyond anything seen in the historical record for millennia, if ever, making it difficult if not impossible to use the historical range of variability to establish reference conditions for restoration. The rapidity of climate change means that at least some of the indigenous flora and fauna that characterize the ecosystems that evolved in a place may no longer be viable in the future. Does it make sense, then, to try to reestablish them through restoration when climate trends seem to preclude their long-term viability? Should restorationists rather try to anticipate climate conditions over the next several decades and introduce plant ecotypes and species that seem more likely to adapt? Does restoration then become just another form of ecosystem management and design that reflects human rather than ecological ends?

Or take the emergence of novel ecosystems – ecosystems that through human influence have been altered in structure, composition and function and persist in relatively stable states free from human management. They have passed a threshold that, for social, economic, or ecological reasons make it largely unfeasible to restore them to a pre-disturbance state or trajectory (Hobbs et al. 2009; Hobbs et al. 2013). How then should restorationists work with such sites when, by definition, they are precluded from using reference sites with historical continuity to determine ecological integrity?

One temptation is simply to abandon the gold standard that has distinguished restoration from other forms of ecosystem management: using ecological integrity informed by historical conditions and continuity to guide restoration. Instead, some argue, we should focus on restoring ecological function to a site, and improve the ecosystem services it provides humans, becoming gardeners of a planet that, in science writer Emma Marris’ words, has become a “rambunctious garden” with no remaining wild places (Marris 2011). Restorationists such as Richard Hobbs maintain that in a planet increasingly shaped by novel ecological conditions, trying to restore ecosystems to a semblance of pre-disturbance conditions is futile and a waste of resources. Instead, restoration can give us the tools to manage novel ecosystems to maximize ecosystem services vital for human survival.

Others, such as Daniel Simberloff, Carolina Murcia and James Aronson, see the very concept of novel ecosystems as a new Trojan Horse for conservation and restoration (Simberloff et al. 2015). At a time when restoration is being integrated worldwide into ambitious international programs and treaties, they argue the goal should continue to be “to re-establish as closely as possible the historical trajectories of ecosystems before human actions drastically changed them, so that the restored ecosystems can continue to respond to environmental changes as these arise.” In a new take on Elliot’s restoration thesis, they argue that too much focus on novel ecosystems “can serve as a Get Out of Jail Free card for companies or individuals trying to avoid investing in research, mitigation or restoration by claiming they are producing novel ecosystems that will provide ecosystem services.”

*Where do we go from here?*

Confronted with ever more pervasive anthropogenic effects on ecosystems, what should restorationists do? My own sense is that recognizing novel ecosystems where they exist adds an important tool to the restoration kit, precisely because it can help to identify those cases where efforts at restoration may not be appropriate. There, efforts can shift to rehabilitation, recovery of ecosystem function, or reclamation, and goals should be clearly articulated. In many if not most cases, however, restoration of ecological integrity with some historical continuity is both possible and desirable, and should continue to be the default goal for restoration.

It is true that all ecosystems in the Anthropocene will show the effects of anthropogenic impacts, whether from acid rain, increased carbon, or invasive species, but these may not disrupt all historical continuity in degraded ecosystems, and unintended consequences of human activities are qualitatively different than intentional manipulation of ecosystems. To continue to strive for restoration of ecological integrity with at least some historical continuity puts a check on the growing temptation to create designer landscapes for ecosystem services, and keeps the moral grounding of restoration in an ethic of humility and responsibility for repairing the harms we have caused. As philosopher William Throop has noted, “the main problem with the gardening metaphor [for restoration] is that it is highly anthropocentric. It does emphasize some moral dimensions of our relation to nature, but it tends to elevate ecological services that nature provides for humans, and not the values associated with nonhuman nature (Throop 2012).” Keeping restoration “hinged to history” grounds a restoration ethic of humility, self-restraint, sensitivity and respect for the other.

It also places restoration within a context of *resistance* to the ever more pervasive utilitarian paradigm that characterizes our technology-dominated world with its fantasies of geoengineering the planet to prevent climate disaster, rather than address the root causes of human behaviors driving the Anthropocene (for further analysis, see Preston 2016). To abandon the moral imperative of restoration in favor of manipulating ecosystems to provide human-favored ecosystem services makes restoration complicit with the utilitarian paradigm, moving us closer to Katz’s “insidious dream of the human domination of nature.” Let’s keep the restorative dimension central to restoration.

## References

Elliot R (1982) Faking Nature. *Inquiry* 3: 81-93.

- Higgs E (2003) *Nature by Design: People, Natural Process, and Ecological Restoration*. MIT Press, Cambridge, MA.
- Hobbs R, Higgs E, Harris J (2009) Novel Ecosystems: Implications for Conservation and Restoration. *Trends in Ecology and Evolution* 24: 599-605.
- Hobbs R, Higgs E, Hall C (2013) Defining Novel Ecosystems. Pages 50-60 In: Hobbs, Eric Higgs R, Hall C (eds) *Novel Ecosystems: Intervening in the New Ecological World Order*. Wiley-Blackwell, Hoboken, NJ.
- Katz E (1992) The Big Lie: Human Restoration of Nature. *Research in Philosophy and Technology* 12: 232.
- Marris E (2011) *Rambunctious Garden: Saving Nature in a Post-Wild World*. Bloomsbury, New York, NY.
- Preston CJ, ed. (2016) *Climate Justice and Geoengineering: Ethics and Policy in the Atmospheric Anthropocene*. Rowman & Littlefield.
- Simberloff D, Murcia C, Aronson J (2015) Novel Ecosystems" are a Trojan Horse for Conservation. *Ensaia* <http://ensia.com/voices/novel-ecosystems-are-a-trojan-horse-for-conservation/>.
- Throop W (2012) Environmental Virtues and the Aims of Restoration. Pages 52-53 In: Thompson A, Bendik-Keymer J (eds) *Ethical adaptation to climate change: Human virtues of the future*. MIT Press, Cambridge, MA.

## Ecological Restoration in Layered Landscapes

*Contributed by Marion Hourdequin, Associate Professor of Philosophy, Colorado College*

Many years ago, I was researching wildland fire management when I came across an unusual document. It was a fire management plan for Big Oaks National Wildlife Refuge in Indiana, and in addition to familiar considerations regarding the use of fire to manage vegetation and maintain wildlife habitat, this plan included a discussion of prescribed burning in areas with unexploded ordnance and depleted uranium contamination (USFWS 2001). Unexploded ordnance? Depleted uranium? In a wildlife refuge? I was surprised, and intrigued.

I soon learned that Big Oaks National Wildlife Refuge is one of many U.S. wildlife refuges established on former military lands. Before its renaming and designation as a refuge, Big Oaks was Jefferson Proving Ground (JPG), a site where the United States tested munitions to ensure their reliability for wartime use. JPG hosted the testing of more than 24 million rounds of ammunition from its establishment in 1940 until its closure in 1995 (U.S. NRC 2015). Bombs, grenades, and tank-penetrating ammunition littered the site, which – after limited cleanup –



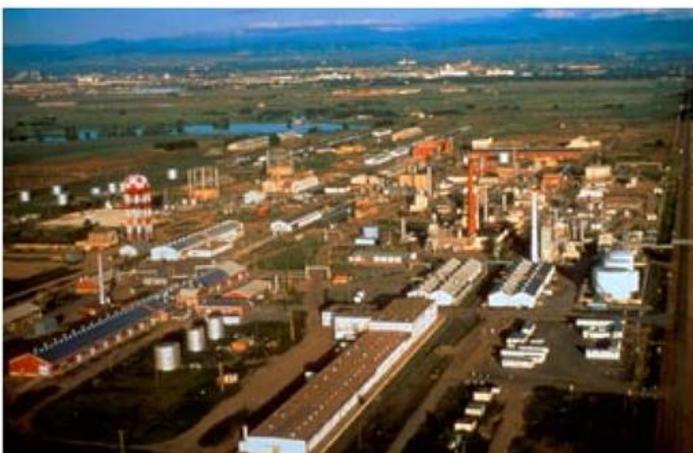
An old sign outside Big Oaks National Wildlife Refuge acknowledges the former identity of the site as a munitions testing area during wartime (photo by David Havlick).

remains contaminated with over 150,000 pounds of depleted uranium and 1.5 million rounds of unexploded ordinance (U.S. NRC 2015).

Clearly, these conditions complicate fire management, as well as management of the refuge more generally. Yet despite years of military use and decades of shelling, Big Oaks today provides valuable habitat for numerous plant and animal species, including Henslow's sparrows, cerulean warblers, river otters, and the endangered Indiana bat (USFWS 2013). Big Oaks includes a mix of woodlands, riparian areas, and grasslands – the last of which are now rare in Indiana and support diverse species of birds as well as a significant population of threatened crawfish frogs (USFWS 2013).

How might one approach restoration and ongoing management of a site like this, with its bewildering juxtaposition of contamination and ecological richness? Refuge managers across the country find themselves asking this question, from Big Oaks in Indiana to Rocky Mountain Arsenal National Wildlife Refuge in Colorado (a former chemical weapons plant) to Aroostook National Wildlife Refuge in Maine (once Loring Air Force Base). Many of these refuges have complex socio-political histories as well as complex ecological ones: at Rocky Mountain Arsenal, for example, the federal government claimed land from more than 200 farm families in 1942, giving them 30 days notice to vacate the site (U.S. Army Rocky Mountain Arsenal Public Affairs Office 1992; Havlick 2007). Construction of the arsenal began while crops still grew in the fields (Havlick 2007). Although in recent years, visitors have described the Rocky Mountain Arsenal refuge as "natural," "wild," and even "untouched" (see Havlick et al. 2014; Havlick and Hourdequin, unpublished survey data), these characterizations overlook decades of intensive human use.

Sites such as these have been described as *hybrid landscapes* (see White 2004; Whatmore 2002), where human and natural processes intermingle, confounding our propensity to neatly classify landscapes as natural or cultural. The characterization is apt. However, these sites not only mix nature and culture in the present; they also have complex socio-ecological histories that have shaped them over time. For this reason, it can be helpful to understand these areas as *layered landscapes*, calling attention to the ways in which their uses, their meanings, and their ecologies have changed over time, and how prior uses, meanings, and ecologies shape possibilities for the future (Hourdequin and Havlick 2016).



Left photo shows the former Rocky Mountain Arsenal South Plant manufacturing complex in 1992. Today, the site is Rocky Mountain Arsenal National Wildlife Refuge and has one of the largest populations of burrowing owls in the state of Colorado (right photo; photos from US Army).

The concept of layered landscapes illuminates key considerations for ecological restoration. The complex, layered histories of these places call attention to the importance of social and ecological contexts for restoration, and their interrelationships (see Hourdequin and Havlick 2011). For example, restoration at a former military site like the Rocky Mountain Arsenal National Wildlife Refuge outside of Denver, Colorado has been both constrained and facilitated by its military history. The constraints arose because the site was highly contaminated with toxic residues associated with chemical weapons and pesticide production – millions of cubic yards of topsoil had to be removed as part of the cleanup there (Natural Resource Trustees for the State of Colorado 2007). On the other hand, restoration was facilitated by the site's military ties, because the cleanup agreement prompted the Army and Shell Chemical Corporation to contribute substantially to the costs of restoring native prairie after remediation of environmental hazards was complete (pers. comm. with refuge staff). Refuge managers have continued restoration efforts, and in recent years, both bison and black-footed ferrets have been reintroduced. Public access to the site has expanded, though visitors are confined to clearly defined areas and two hazardous waste landfills at the site are strictly off-limits.

From an ethical perspective, sites like this reveal the complexities of restoration and the need to consider not only the traditional goal of ecological recovery, but also human health, future land use and public access, relationships with surrounding communities, how restored sites convey or fail to convey socio-political histories, including histories of environmental damage and injustice, and so on. Wildlife managers have a clear mission to protect and restore native plants and animals at the Arsenal, a goal that many visitors and local residents share, but many locals also want to ensure that the layered history of the site remains visible to the public (Havlick et al. 2014). A well-designed visitor center highlights this layered past, but might various historical layers be revealed or memorialized in the landscape itself? Philosopher Martin Drenthen (2016) has suggested that landscape art might help accomplish this goal.

Because restoration goals in layered landscapes so often clearly intertwine with social, political, and economic considerations, restoration planning at these sites engages diverse values and visions. While ecological restoration has developed a vibrant tradition of community engagement in many projects on the ground – planting trees, bringing back native prairie, and restoring streams and riparian zones – layered landscapes highlight the value of an equally vibrant practice of engagement in the establishment of restoration goals and objectives. Community-engaged restoration planning is challenging, as it can bring forward competing visions for a site and stark disagreements about its future. We see this in another of Colorado's layered landscapes, the Rocky Flats National Wildlife Refuge, a former nuclear weapons plant south of Boulder, Colorado. Here, conflict has flared over Fish and Wildlife Service plans to engage in prescribed burning to manage invasive plants and restore native vegetation, and visions for the site as a whole sharply diverge, with some viewing it as a natural area and haven for wildlife, and others advocating that it be memorialized as a contaminated national sacrifice zone, emblematic of the social and environmental costs of the Cold War (for further discussion, see Hourdequin 2016).

Although contextual and participatory approaches to restoration bring challenges, they can also generate creative and fruitful restoration projects that accomplish both social and ecological goals – and that challenge a neat separation between such goals. Managers at Aroostook National Wildlife Refuge in Maine, for example, have adapted large, concrete storage bunkers at

the site as bat hibernacula (USFWS 2013b). These prominent remnants of military use now both exemplify the site's past and its future, providing both historical context and ongoing ecological value.



Cold War era bunkers at Aroostook National Wildlife Refuge have been repurposed for use as "bat bunkers," that provide habitat for overwintering bats. Left photo shows external view of one bunker being fitted with a thermal mat. Right photo shows the interior of a bunker with substrate installed to promote bat roosting (photos from USFWS).

Looking around, we see that layered landscapes exist almost everywhere. Where human and natural histories interweave over time, contextually-sensitive, participatory restoration can generate a fruitful "negotiation between the land and human culture" (Norton 2005, p. 94). Such negotiation takes seriously complex and sometimes conflicting narratives to generate creative possibilities for ecological recovery that can do justice to both the natural and social histories of a place.

## References

- Drenthen M (2016) Layered landscapes, conflicting narratives, and environmental art. Pages 239-262 In: Hourdequin M, Havlick D (eds) *Restoring Layered Landscapes: History, Ecology, and Culture*. Oxford, New York, New York.
- Havlick DG (2007) Logics of change for military-to-wildlife conversions in the United States. *GeoJournal* 69: 151-164.
- Havlick DG, Hourdequin M, John M (2014) Examining restoration goals at a former military site: Rocky Mountain Arsenal, Colorado. *Nature and Culture* 9: 288-315.
- Hourdequin M, Havlick DG (2011) Ecological restoration in context: ethics and the naturalization of former military lands. *Ethics, Policy and Environment* 14: 69-89.
- Hourdequin M (2016) Ecological restoration, continuity, and change. Pages 13-33 In: Hourdequin M, Havlick DG (eds) *Restoring Layered Landscapes: History, Ecology, and Culture*. Oxford, New York, New York.
- Natural Resource Trustees for the State of Colorado (2007) *Natural Resource Damage Assessment Plan for the Rocky Mountain Arsenal, Commerce City, Colorado*. Denver, CO: Natural Resource Trustees for

the State of Colorado. Available at: <https://www.colorado.gov/pacific/cdphe/rocky-mountain-arsenal> [scroll down to "assessment plan"; accessed July 12, 2016].

Norton B (2005) Sustainability: A Philosophy of Adaptive Ecosystem Management. University of Chicago Press, Chicago, Illinois.

USFWS [U.S. Fish and Wildlife Service] (2001) Big Oaks National Wildlife Refuge, Jefferson, Jennings, & Ripley counties, Indiana: Fire Management Plan. U.S. Fish and Wildlife Service, Madison, Indiana.

USFWS [U.S. Fish and Wildlife Service] (2013a) Big Oaks National Wildlife Refuge: wildlife and habitat [https://www.fws.gov/refuge/Big\\_Oaks/wildlife\\_and\\_habitat/index.html](https://www.fws.gov/refuge/Big_Oaks/wildlife_and_habitat/index.html) (accessed 12 July 2016).

USFWS [U.S. Fish and Wildlife Service] (2013b) News release: retired military bunkers used as artificial bat hibernacula at Aroostook National Wildlife Refuge in Maine <https://www.fws.gov/news/ShowNews.cfm?ID=0DA476C9-AE33-F4D0-2BE4EF9E2ECBF61B> (accessed 12 July 2016).

U.S. NRC [United States Nuclear Regulatory Commission] (2015) Jefferson Proving Ground <http://www.nrc.gov/info-finder/decommissioning/complex/jefferson-proving-ground-facility.html> (accessed 11 July 2016).

U.S. Army Rocky Mountain Arsenal Public Affairs Office (1992) Eagle Watch 4(8). Commerce City, CO.

Whatmore S (2002) Hybrid Geographies: Natures Cultures Spaces. Sage, London, United Kingdom.

White R (2004) From wilderness to hybrid landscapes: The cultural turn in environmental history. *Historian* 66: 557-564.

## **Restoring for an Uncertain Future: Cultivating Reciprocal Relationships in the Face of Global Change**

*Contributed by Lilian Pearce and Ella Furness*

*Lilian is a PhD candidate with the Fenner School of Environment & Society, The Australian National University. Ella is a PhD student with the Sustainable Places Research Institute, Cardiff University.*

Today's tempestuous social and ecological environment raises ethical considerations that ask us to question how we think about and approach ecological restoration. Ethics become critically important as we recognize that our actions are ephemeral and that we restore in the context of an always-changing world. Indeed, as the role of historical references in ecological restoration is questioned alongside the morality of restoration on a changing planet, (Higgs et al. 2014; Rowher and Marris 2016) it becomes increasingly important to explain the goals and motivations behind restoration. The inherently uncertain future that accompanies every restoration project encourages restorationists to examine their reasons for engaging in this work.

In the industrialized western world, humans are easily cast as the 'bad guys' in their relationship with nature. We clear, farm, and extract what we want without giving back, thereby establishing a semblance of control over the natural environment. However, our relationship with nature is

not inherently destructive, nor are we ever capable of being fully in control. Restoration provides an alternative way of being in world that nurtures constructive relationships with nature: we plant trees, remove roads and reintroduce species, all with the intention of undoing damage and caring for non-human species and landscapes. When executed properly, ecological restoration can be inclusive, healing, dynamic and humbling (Spencer 2011; Hourdequin 2015).

There are many examples of human-ecosystem relationships now and throughout history that are positive and reciprocal. For example, Robin Wall Kimmerer has documented the intimate relationship between indigenous peoples and sweetgrass – a relationship that has been maintained for many years through an ethic of reciprocity, with both parties thriving as a result of the relationship (Kimmerer 2011). For many anthropologists, this type of reciprocity, attention or 'gift giving' (Mauss 1954) is thought to be central to the development and maintenance of human communities. William Jordan (2003) argues that restorationists can also enter into a reciprocal relationship with nature through the act of giving. He emphasizes that though we can never be sure of fully reciprocating the services an ecosystem or place provides, the act of giving (restoring) itself can enable us to live with this uncertainty.

In our research, we are exploring how restorationists emotionally and intellectually navigate their work. Operating on opposite ends of the world, we use the social research methods of participant observation (where we take part in restoration practice while observing the practice itself), as well as in-depth interviewing and group discussion to record people's motivations, experiences, and responses to restoration. Through these techniques, we aim to understand what people bring to restoration practice and the potential social outcomes. Our present research builds on work that suggests that restoration can strengthen respectful relationships between people and the environment (Higgs 2003), and argues that place-based practices that accept unpredictability and operate with generosity can cultivate an ethic of care. Here, we briefly report on two examples from our work where the practice of restoration is fostering reciprocal relationships between humans and their environments: the first, through the intentional practice of gift-giving; the second, through committed restoration in the direct face of climate change.

In Scotland, an organization called Trees for Life is using tree planting to engage people in restoration of the Caledonian forest. The sites are treeless and barren, degraded following hundreds of years of deforestation, extirpation and overgrazing. Through Trees for Life's [website](#), people can buy trees and dedicate them to a loved one's memory or a special event. As volunteers plant the trees, they recite quotations and memories and focus on the dedication. After a solitary tree planting, the volunteers regroup to be present on the mountain, often imagining together the landscape changing over time as the trees grow. These dedications are symbolic gifts: gifts to the departed, the newly born or recently married, and of course, gifts to the restoring of the Caledonian forest. In interviews, volunteers talk about planting trees as an act of hope and humility. The volunteers know that



Volunteers walking into the mountains to plant birch (*Betula pubescens*) and hazel (*Corylus avellana*) at Corrimony in the Scottish Highlands

not all the trees will grow to maturity – some may get eaten by deer before the year is out, but some may live for hundreds of years. For many volunteers, the opportunity to contribute something positive in the face of overwhelmingly complex global problems is hugely valued. Of all of the many restoration tasks that the volunteers do, planting trees is by far the most satisfying and healing. As Gretel Van Wieren (2008) has demonstrated, through attributing gift-giving significance to everyday acts of restoration, these actions are elevated to a more meaningful status.

Far away, on the south east coast of Australia a small group of volunteers restores a freshwater lagoon poised on the turbulent edge of land and sea. This place has come a long way from its cleared, overgrazed and overfertilized colonial history. Today, a fragile dune system, and the crumbling disused coastal road built upon it, isolate the ecologically significant freshwater ecosystem from the saline ocean. Here, rising sea levels and increasing frequency and intensity of storms that bring unpredictable and exceptionally high tides threaten its future. This is just one of many examples of a community consciously restoring in the face of impending change. When asked about the future of this place, participants emphasized the importance of care in the present. One volunteer said ‘anything could happen in twenty years, I just try and live in the moment and appreciate it for how it is right now.’ Such a practice of restoration requires people to labor for the places and species that they care about, while acknowledging the inherently transitory nature of these systems. This community restores as an offering in spite of what the future holds and with gratitude for the personal healing that they experience along the way.



The successful restoration efforts on the New South Wales south coast are enhancing diversity and resilience, yet king tides and rising sea levels threaten the future of this freshwater lagoon.

In these two very different contexts, we find individuals who are participating in meaningful relationships with each other, and with their non-human communities, through restoration work. In both cases, committed and generous activities are carried out with a focus on engagement in the present, while accepting the impossibility of controlling the future. We find examples of often unrecognized and uncelebrated efforts. We find caring individuals, some of whom are plagued by the state of the environment and the threats of climate change, engaging with ecological restoration as a practical way to have positive relationships with the places that they care for. We consider such forms of restoration helpful for cultivating ways of being in the world that allow for humility, vulnerability and courage to take the fore. Participatory ecological restoration practices provide opportunities for people to enter into caring relationships with their human and non-human communities in tactile, multi-sensory ways. In doing so, they provide alternatives to dominant contemporary narratives of crisis, fear and commodification, and nurture relationships between people and place through change.

## References

- Higgs E (2003) *Nature by Design: People, Natural Process, and Ecological Restoration*. MIT Press, Cambridge, Massachusetts.
- Higgs E, Falk D, Guerrini A, Hall A, Harris M, Hobbs RJ, Jackson ST, Rhemtulla, JM, Throop W (2014) The changing role of history in restoration ecology. *Frontiers in Ecology and the Environment* 12: 499–506.
- Hourdequin M (2015) *Environmental Ethics: From theory to practice*. Bloomsbury Academic, New York, New York.
- Hourdequin M, Havlick DG, eds. (2016) *Restoring Layered Landscapes: History, Ecology and Culture*. Oxford University Press, New York, New York.
- Jordan WR (2003) *The sunflower forest: ecological restoration and the new communion with nature*. University of California, Berkeley, California.
- Kimmerer R (2011) Restoration and reciprocity: the contribution of Traditional Ecological Knowledge In: Egan D, Hjerpe E, Abrams J (eds) *Human Dimensions of Ecological Restoration*. Island Press, Washington, D.C.
- Mauss M (1954) *Essai Sur Le Don. The Gift. Forms and Functions of Exchange in Archaic Societies*. Translated by Ian Cunnison. With an Introduction by EE Evans-Pritchard. London.
- Rohwer Y, Marris E (2016) Renaming restoration: conceptualizing and justifying the activity as a restoration of lost moral value rather than a return to a previous state. *Restoration Ecology*. DOI: 10.1111/rec.12398.
- Spencer D (2011) Recreating [in] Eden: Ethical Issues in Restoration in Wilderness In Dixon M, Clingermann F (eds) *Placing Nature on the Borders of Religion, Philosophy and Ethics*. Ashgate Publishing, Surrey, England.
- Van Wieren G (2008) Ecological restoration as public spiritual practice. *Worldviews: Global Religions, Culture, and Ecology* 12: 237-254.

## SER Corporate Sponsorship Ethics & Decision-Making Framework

*Contributed by Tom Sentner and Lindsay Wancour, Graduate Students in Environmental Studies, University of Montana*

### Background and Need

Corporate sponsorships raise a variety of ethical issues for nearly any non-profit organization. The Society for Ecological Restoration (SER), however, faces specific challenges because of its unique position bridging degradation and restoration. The very industries and entities who are most in need of restoration expertise and information are often the same entities who have caused the very ecological damage and degradation that requires restorative action. Much ecological degradation or environmental harm is associated with industrial activity, especially resource extraction (e.g. mining, oil and gas extraction, logging), though restoration is also

often required in association with nonresource extractive impacts (e.g. manufacturing). Whether compelled by law or motivated by a desire to improve brand image, in practice a large segment of ecological restoration is corporate, and corporations are often at the forefront of the application of restoration ecology. Is it appropriate or inappropriate, therefore, for SER to consider sponsorship from ecologically damaging industries and corporations? And how can SER most effectively and justifiably make such a determination? The field of environmental ethics offers an excellent framework for answering this question and developing a set of ethical guidelines for corporate sponsorship.

## **Key Ethical Considerations**

SER defines ecological restoration as the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed (*SER Primer 2004*). SER seeks to promote restoration as a vital tool for recovering degraded landscapes.

From the very outset, restoration has been accused of being a trojan horse for industry. In his 1982 essay "Faking Nature," Robert Elliot was one of the first to articulate a central ethical problem of ecological restoration: industry may use restoration promises to undermine opposition to despoiling natural areas. Elliot argued that industry was promoting a "restoration thesis" that harming nature is permissible because we can put it back later.

Responding to Elliot's objections, environmental philosopher Andrew Light distinguished between what he termed "malicious" restoration described by the restoration thesis, and "benevolent" restoration activities that heal past harm but do not serve to rationalize further destruction. Light proposes that "malicious restorations are those that are offered as substitutes for original systems and the possibility of their creation is supposed to justify the destruction of the original system. In contrast, benevolent restorations are those that are undertaken to remedy some kind of intentional or unintentional destruction of a natural system and not offered as prior justification for a destructive act." (*Valuing Novel Ecosystems ch.31*)

This conflict between restoration as ecologically sound practice and restoration as deceitful excuse for environmental destruction means that any sponsorship relationships between SER and corporations may be subject to intense scrutiny. Any financial ties between SER and deceitful or destructive corporate behavior could be seen as proof that the restoration thesis is true, especially as implemented through malicious restoration.

Indiscretion on the part of SER in vetting corporate sponsors and distinguishing malicious from benevolent restoration could lead to associations that tarnish both the SER brand and the public perception of ecological restoration in general because of the highly visible role the Society plays within the field. If restoration becomes viewed as a corporate ploy for further ecological destruction it may lose public support. This could jeopardize public support for government policies that require restoration as well as public support for SER. Additionally, it could jeopardize the involvement of thousands of volunteers as well as the benefits derived from participating in restoration, such as learning about nature, feeling connected to place, the feeling of "ecological citizenship," and the feeling of doing the right thing and giving back. Many thousands of volunteers participate in restoration projects across the world each year.

While corporate sponsorship is an important funding tool, it must be approached deliberately and ethically, using a consistent and transparent framework that enables SER to ensure such partnerships are consistent with long-term organizational and ecological goals.

### **Key Corporate Sponsorship Themes**

In order to develop a comprehensive policy that will fully protect SER, it is instructive to look at the policies of other organizations that also solicit and/or accept corporate sponsorships. We reviewed four policies, representing both large and small organizations as well as more and less restrictive sponsorship approaches. We looked at The Nature Conservancy, Environmental Defense Fund, Sierra Club, and The Cumberland (Maine) District Health Council. The following themes emerged, all of which are relevant to any formal policy SER may adopt.

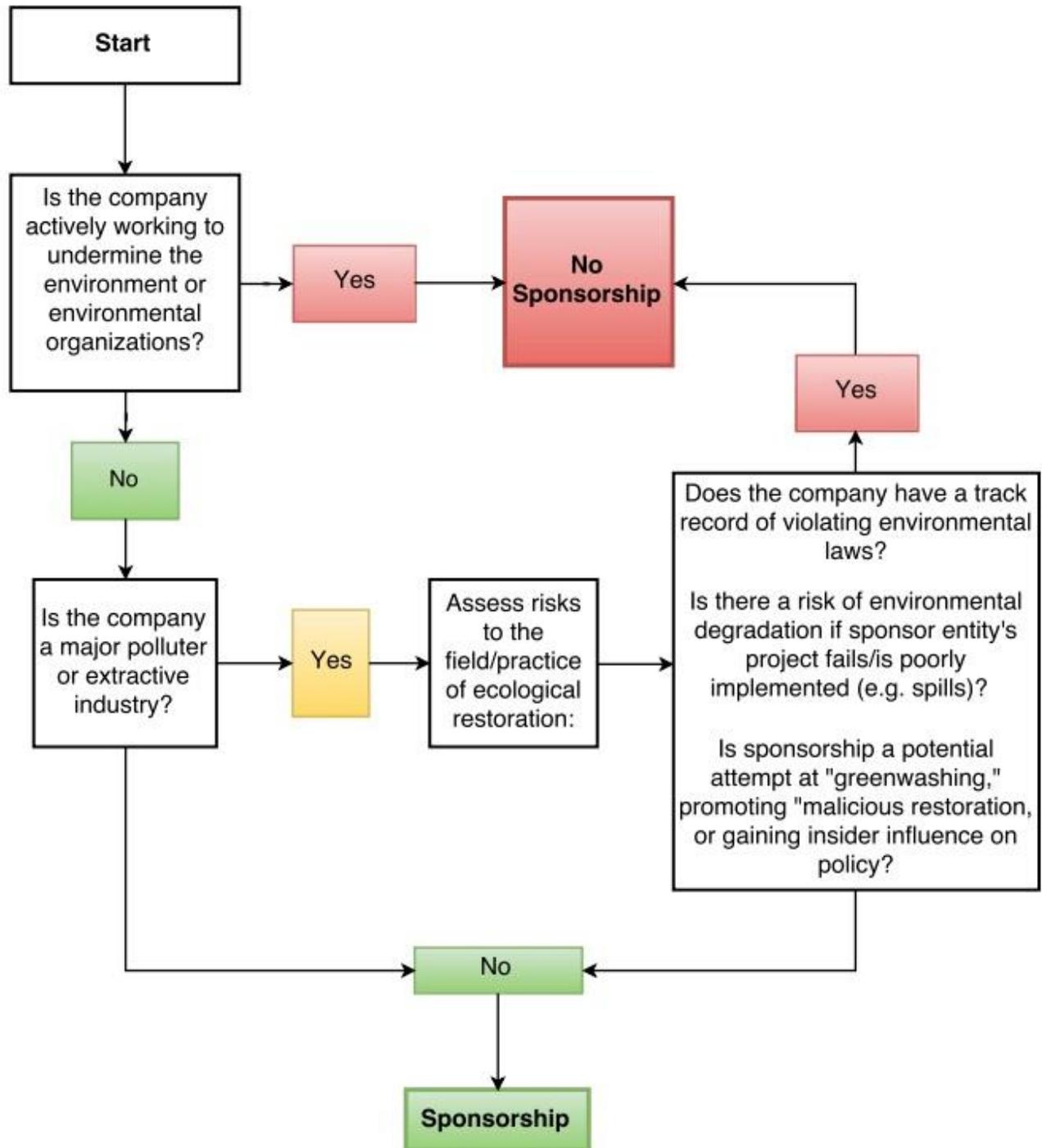
1. No endorsements, real or implied, are given to the sponsoring corporation.
2. The relationship with the sponsoring corporation remains transparent, and SER remains independent.
3. Corporate sponsorship will confer no real or assumed rights to the corporation to influence SER's policies, positions, practices or science.
4. There will be no conflict of interest such as:
  - a. Greenwashing; sponsor gaining an environmentally friendly image through partnership with SER
  - b. Confirming the Restoration Thesis
  - c. Supporting malicious restoration
  - d. Attempting to influence SER's actions for private gain

### **Creating an ethically-based decision-making structure for corporate sponsorship**

Considering the complex history of ecological restoration and the recurring themes in other non-profits' policies regarding corporate sponsorship, the question of sponsorship is particularly challenging. In addition, because SER is the international network and clearinghouse on issues related to restoration, any decisions SER makes can be seen as representing the field itself. Thus SER resolves to accept sponsorships only from entities that, to the best of our knowledge, are ecologically responsible. To help SER maintain both our own organizational integrity and integrity in the field of ecological restoration, we have developed and are using the following decision chart when considering corporate sponsorships.

See the corporate sponsorship decision-making tree below.

## Corporate Sponsorship Decision-Making Tree



## Society News

Dear Colleagues,



It feels like we're in the middle of that time of year when things slow down. I must admit to being envious of the higher than usual number of "out of office" messages I receive from SER members who are taking well-deserved vacations.

While it may feel a little slow, let me assure you there's still a lot going on at SER!

First, we want to welcome Jen Lyndall as our new Certification Program Coordinator. Since December, Jen has been volunteering to build out an SER Certified Ecological Restoration Practitioner Program, which the board approved at its June meeting. We expect to formally announce the program within the next few months, and we hope to open the first application cycle in early 2017. Jen lives and works in Cleveland, Ohio and is a longstanding member of our Midwest Great Lakes Chapter, including serving as Chair of the MWGL Chapter Board in 2015-2016. She will be working halftime on this project and we are thrilled to have her officially on board!

We also want to welcome former board chair George Gann as an SER Global Restoration Ambassador (GRA). SER has appointed volunteer Restoration Ambassadors in the past, but it has been many years since we have done so. At their June meeting, the SER Board reinstated our GRA Program and invited George to be an ambassador. We are delighted he accepted! George is the Chief Conservation Strategist at the Institute for Regional Conservation (IRC) in South Florida. In 2015 George was invited by the Board to rejoin its Science and Policy Committee, where he has been taking the lead on a project to develop international restoration standards. We look forward to continuing to build on his expert work at IRC to advance ecological restoration.

We are also pleased to announce the latest publication in our Island Press Series: Ann Riley's [Restoring Neighborhood Streams](#), a detailed guide for restoring urban streams that fosters a mutual relationship between the built and natural environments. As an SER member, you can receive a 25% discount on the book. Just use the promo code **2SER** at checkout.

And speaking of Island Press, have you taken our [Island Press Book Survey](#)?

We are very interested in hearing from you to ensure the series meets your interests, while we also re-assess whether it is meeting our organizational goals as well. It will only take a couple of minutes and your feedback is very important.

We're also excited about the publication of the world's first national standards for ecological restoration in a special edition of [Restoration Ecology](#) in June. Congratulations to the leaders of SER Australasia who led a three-year collaborative process in partnership with more than 300 individuals, groups, government agencies and industries to produce these standards, which offers a template not just for Australia, but for other countries around the world. A quick overview of the Standards is available via the [press release](#) we sent out in July, or you can go

straight to the [June issue of Restoration Ecology](#) and read the full report. The issue is open access and you can download a pdf copy of the document

As we noted in the last issue of *SERNews*, SER has been closely involved with the Convention on Biological Diversity this year and the capacity-building workshops they are hosting around the world. Many thanks to Nigel Tucker, Principal Environmental Scientist with [Biotropica](#), who represented SER at the June 27th CBD workshop in Bangkok, Thailand. Around 50 participants from 26 nations attended this workshop to develop action plans for meeting the [Aichi Biodiversity Targets](#), including Target 15, which calls for the restoration of 15% of degraded lands by 2020. You can view Nigel's presentation [here](#).

Finally, one of SER's founding members, Bill Jordan III, has started a blog we think you might want to check out: [Environmental Prospect](#), "an argument for a new environmental paradigm." Jordan coined the term "ecological restoration" and is an influential thinker in the field dating back to the mid-1980s.

As always, thank you for your membership with SER. We are so pleased to have you as a member of the Society. Please don't hesitate to drop me a note with questions or comments. It's always a pleasure to hear from you!

Cheers,

Marguerite Nutter  
Membership & Communications Director

## **SER Section Update: International Network for Seed-Based Restoration (INSR)**

*Contributed by Nancy Shaw, SER Board Member, Representative-At-Large and Director-At-Large of INSR*

The International Network for Seed-based Restoration (INSR) now has 156 members! Members are located in 15 countries on 5 continents with the greatest representation of individuals and organizations in North America, Australia and Europe, respectively. We are actively seeking more involvement from our under-represented regions: Africa, Asia and South America. For information on INSR activities, please visit our [website](#) and click the "Take Action" tab to learn how to become a member. The [events](#) tab has information on upcoming seed conferences, workshops and meetings.

INSR has also initiated a webinar series, and Professor Kingsley Dixon, Curtin University, Bentley, West Australia, and INSR Chair, recently presented the inaugural webinar "SMOKE: a short story about an ancient phenomenon." The webinar outlines the fascinating story of the scientific



Australian bushfire, smoke water apparatus, and germination response to smoke water treatment (photos by Kingsley Dixon).

discovery of smoke-stimulated germination, describes the long-term research effort conducted to identify the active compound involved in this process, and the positive effects on germination observed across more than 2,000 plant species. View the webinar and get information on future presentations [here](#).

INSR members are involved in fascinating projects around the globe and we are striving to bring their work to you via the INSR website. For example, Bernhard Krautzer's working group in Austria is conducting research on using regional seed material from semi-natural grasslands in Austria for use in conservation and restoration projects. You can read all about their current work in an article by Albin Blaschka, Bernhard Krautzer and Wilhelm Graiss on the [INSR website](#).

### **New! SER Island Press Book Series Title: Restoring Neighborhood Streams**

With urban development on the rise, city design with an environmental component is sorely needed, and award-winning hydrologist Ann L. Riley knows how. This book presents the author's thirty years of practical experience managing long-term stream and river restoration projects in heavily degraded urban environments. Riley provides a level of detail only a hands-on design practitioner would know, including insights on project design, institutional and social context of successful projects, and how to avoid costly and time-consuming mistakes. *[Restoring Neighborhood Streams](#)* gives better solutions for restoration projects, as well as the tools to build better cities in the long term.

### **SER Report - Academic Programs in Ecological Restoration: Recommendations for Westfield State University**

As a professional society, SER works to improve the quality of restoration practice by offering guidance on educational standards for the field. Because universities play a large role in providing the education, skills, and knowledge required to meet societal and environmental challenges, they must regularly adapt curricula to meet changing needs. Given current and anticipated growth in ecological restoration, there is a critical need for development of academic programs to train the next cadre of restoration professionals.

Earlier this year, SER worked with the Massachusetts Division of Ecological Restoration (MA-DER) and Westfield State University (WSU) to assess the potential for development of a new degree program in ecological restoration at WSU. The northeastern region of the US is an area with increasing activity and opportunities in restoration. Massachusetts, for example, has more than 3,000 dams, many of which are no longer functioning for their intended purpose. Yet the Northeast has the lowest number and frequency of restoration degree programs making it a region that would benefit substantially from program development.

SER worked with Dr. Cara R. Nelson (Associate Professor, University of Montana, and Past Chair, SER) and Michael Leff (Consultant, Ecological Connections, and past board member SER) to assess opportunities to create a comprehensive set of recommendations for a restoration degree program at WSU. The program proposal centers on a multi-year field-learning practicum to be implemented with local restoration entities, including MA-DER. As part of this work, Dr. Nelson assessed the distribution and growth of academic programs in ecological restoration in the U.S. and Canada over the last 10 years, building on an article that she and collaborators had

published in [Restoration Ecology on the same topic in 2008](#). Results of the current study will be released after they undergo peer-review.

SER is available to work with other universities on ecological restoration degree development and academic assessment. In addition, when we launch our new website, SER plans to feature information that will assist students in identifying academic opportunities.

## **New SER Organization/Business Members**

The following businesses and organizations became new SER members in July. Welcome!

[Leaf Ninjas](#), Calgary, Alberta, Canada  
[Davey Resource Group](#), Kent, Ohio, USA

## **SER Chapter Conferences & Events**

### **SER Europe Conference 2016**

*Best Practice in Restoration*

*August 22-26, 2016 – Freising, Germany*

The 10<sup>th</sup> European Conference on Ecological Restoration promises a friendly and exciting atmosphere to stimulate dialogue between restoration scientists, practitioners and policy makers, and to collaborate on the challenge of **Best Practice in Restoration**. [Registration is now open](#).

### **SER New England Chapter Biennial Conference**

*Ecological Restoration in a Changing Climate: Ecosystems, Adaptation, Infrastructure and Resiliency*

*October 14-15, 2016 – University of New Hampshire, Durham, NH*

SER-NE invites you to submit an abstract for their upcoming conference on the role of ecological restoration values and practice in a changing climate. Land stewards, scientists, students and practitioners are all encouraged to attend and participate in the many activities planned, including presentations, a poster session, field trips and more.

### **SER Southeast Chapter Annual Symposium and Membership Meeting**

*Headwaters to Hightide: Expanding Opportunities for Restoration*

*October 19-21, 2016 – Quincy, Florida*

SER-SE invites you to submit an abstract for presentations as part of the technical sessions at their conference "[Headwaters to Hightide: Expanding Opportunities for Restoration](#)" October 18-21, 2016 in Quincy, Florida. They are especially interested in topics of Aquatic and Terrestrial Restoration, Invasive Exotics, Monitoring, Climate Change Implications, Adaptive Management, Ecosystem Services, Reference Sites, Practitioner Considerations, Education and Outreach, Endangered Species and New Ideas. You can find additional details about the submission guidelines on [SE-SER's website](#).

### **SER Southwest Annual Conference**

*Where Practitioners and Scientists Connect*

*November 9-11, 2016 – Las Vegas, Nevada*

SER-SW invites submissions for presentations and posters on any topic related to restoration, management, or conservation of natural areas in the Southwest Chapter Ecoregions. Abstracts should be submitted by September 2, 2016. Click [here](#) for the Call for Abstracts.

### **TXSER Annual Conference**

*Linking Science and Practice*

*November 11-13, 2016 – Livingston, Texas*

Come network and find new, exciting ways to contribute to the field of ecological restoration in Texas, through presentations, speakers, and field trips. [Registration](#) is now open.

### **SER Australasia (SERA) & New Zealand Ecological Society (NZES) 2016 Joint Conference**

*ERA 2016 – Ecology & Restoration, Australasia – Restoring resilience across all environments*

*November 19-23 – Claudelands, Hamilton, New Zealand*

[Registration](#) is open through September 30, 2016 for what promises to be an engaging and inspirational conference geared toward the goal of restoring resilience to all environments (land and sea, urban and rural). An entire day of presentations will be specifically targeting restoration practitioners and community volunteers.

### **SER2017 World Conference on Ecological Restoration**

*Linking Science and Practice for a Better World*

*August 27-September 1 – Iguassu Falls, Brazil*

The 7th SER World Conference on Ecological Restoration will take place in Iguassu Falls, Brazil from August 27-September 1, 2017. Be sure to mark your calendar for what promises to be a spectacular venue and spirited group of conference goers! Details are forthcoming.

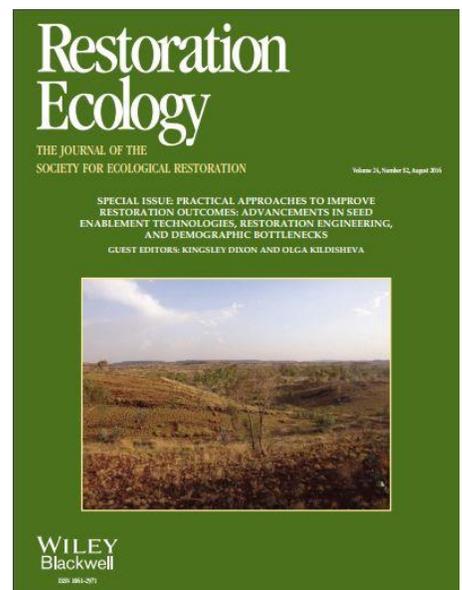
## ***Restoration Ecology, Editor's Picks***

The July 2016 issue of [Restoration Ecology](#) (Vol. 24, Issue 4) is available online. Featured below are some Editor's Picks courtesy of Editor-in-Chief and Managing Editor of *Restoration Ecology*, Stephen Murphy and Valter Amaral.

### **Leveraging nature's backup plans to incorporate interspecific interactions and resilience into restoration**

*Clare E. Aslan, Judith L. Bronstein, Haldre S. Rogers, Keryn B. Gedan, Jedediah Brodie, Todd M. Palmer, Truman P. Young*

Clare Aslan and colleagues focus on what we often forget: that even after disruption, populations will exhibit traits that allow them to persist. Populations of such resilient species could be used to nurse others during restoration, because these species could bolster the resilience of species interactions following a disturbance (EIC's own experience is that some butterflies can play this role; the authors also found this to be true).



## **To what extent can and should revegetation serve as restoration**

*Douglas A. Kelt and Peter L. Meserve*

This is a key question in Restoration Ecology and one too often neglected. In their study, the authors found that a focus on revegetation alone did very little to restore anything like the faunal components of the ecosystem. Perhaps all that is needed is time but in this case, that is not likely. Better comprehensive planning is needed in restoration that targets increased plant diversity and cost-benefit analyses.

## **One option, two countries, several strategies: subjacent mechanisms of assisted migration implementation in Canada and France**

*Roxane Sansilvestri, Nathalie Frascaria-Lacoste, Juan Fernández-Manjarrés*

Climate change obliges societies to develop adaptive strategies in order to maintain sustainable management of resources and landscapes. However, dialogue between researchers and policy-makers can be hindered by language differences, the hidden agendas and conflicting concerns of those involved. In this study, the authors interviewed 80 researchers in Canada and France about the mechanisms that underlie the implementation process of assisted migration (AM), an adaptation strategy that aims to limit the impact of climate change by moving species and/or populations to their predicted future climatic range. AM is still very controversial and resistance by the study's respondents was exacerbated by poor communication and cultural attachments. Where the impacts of climate change were already apparent in some Canadian locations, however, AM was being utilized.

**Want to subscribe to *Restoration Ecology*?** Email [membership@ser.org](mailto:membership@ser.org) to add a subscription to your current SER membership, or renew your membership with a subscription online: [www.ser.org/page/membership](http://www.ser.org/page/membership)

## **In Case You Missed It**

### **SER Webinar: Dune Conservation along Lake Michigan: Lessons from Geomorphology, Ecology, and the European Experience**

Dr. Ed. Hansen and Suzanne Devries-Zimmerman presented on dune ecology and management in this webinar hosted by the Society for Ecological Restoration and the SER Midwest-Great Lakes Chapter.

### **SER Webinar: Restoring the Living Skin of the Earth: Biocrusts in Dryland Restoration**

Matthew Bowker, Kristina Young, and Henry Grover of the Forest-Rangeland Soil Ecology Lab of Northern Arizona University are working towards incorporating biological soil crusts into the restoration picture. In this webinar, they shared their progress and plans for restoring biocrusts.

**Know someone interested in ecological restoration? Please share this issue of SERNews with them!** For information on how to become an SER member, drop us a note at [membership@ser.org](mailto:membership@ser.org) or visit our website at [www.ser.org](http://www.ser.org).