

Letter from SER's Board Secretary Stuart Allison

Dear SER Members,



Restorationists working in the American Midwest are justifiably proud of the important role played by Midwesterners in the foundation of the practice of ecological restoration. Although we can find examples from other parts of the world that predate the first restorations done here, it is in the Midwest that ecological restoration first blossomed and subsequently inspired the spread of restoration work around the world. The first academic studies of ecological restoration began at the University of Wisconsin Arboretum in 1936 with the planting of the Curtis Prairie. The plantings at the Arboretum motivated local people, and in the 1960s and 70s more and more

restoration projects were initiated, not by academics and government officials, but by nature lovers and citizens concerned about the loss of ecosystems that they only vaguely remembered from their childhood or heard about in stories from their grandparents. The original focus on prairie restoration expanded to include restoration of all Midwestern ecosystems – savannas, wetlands, forests and woodlands, rivers, lakes, and old mine sites. Gradually, we realized that urban areas also would benefit from restoration, and thus in the last 20 to 25 years we have seen an increasing emphasis on restoring brownfields and other degraded urban sites.

In some ways, ecological restoration in the American Midwest is an especially challenging prospect. The landscape is almost completely domesticated with seemingly every square meter converted to agriculture, industry or urban, suburban and small-town habitats. Even the great North Woods of northern Wisconsin, Minnesota and Michigan have almost no virgin forest left intact. In this environment, there is very little remaining wild habitat to preserve and use as a model for restoration, with few wild populations left that can provide sources of propagules for establishing new populations to rewild the landscape. The largest areas available for restoration are typically only a few thousand hectares at best. Perhaps it is because of these challenges that ecological restoration has been so heartily embraced by the Midwestern restoration community. If we are to have any ecosystems that are wild or semi-wild, that contain species of little to no direct use to humans, that are free to evolve outside the limitations imposed by human needs, then we will have to plant and grow those ecosystems ourselves. Here the need for restoration is readily apparent. In this issue of *SERNews*, we highlight some of the current restoration work being done in the region.

When I was growing up in downstate Illinois, we read the poetry of Carl Sandburg in our classes, and I came to think of Chicago as the “Hog butcher of the world, Tool maker, Stacker of wheat,... City of the Big Shoulders” (as well as the home of Cubs and White Sox baseball), but now I think of the greater Chicago area as one of the most progressive, restoration-focused places in the world. The visionary Chicago Wilderness Green Infrastructure Vision has evolved to become a key part of a plan that will allow wild species to move through a series of connected ecosystems from the southern end of Lake Michigan up into southern Wisconsin. The various proposed parks and reserves include land managed by over 300 different organizations and agencies and total about 220,000 protected hectares, with a potential for up to 770,000 hectares being protected. Although there are many challenges that must be solved before this plan can be fully implemented, it is a tremendously exciting effort.

The use of prescribed fire in the Midwest is also a challenge relative to other parts of the world due to the many small areas needing to be burned and their proximity to agricultural fields, human dwellings and buildings. Grassland and savanna fires tend to be flashy and burn quickly, thus requiring special precautions. However, Midwesterners have developed, and continue to refine, burning practices that allow the use of prescribed fire for restoration, and you will read about some of those practices in this issue.

There is a very dynamic ecological restoration community at work in the Midwest, and it has been my privilege to represent that community on the SER board, first as a Regional Representative and now as Board Secretary. I hope all SER members will enjoy learning a bit more about restoration in this unique region, which also happens to be the birthplace of SER.

Sincerely yours,

Stuart Allison
SER Board Secretary

Thanks for all your hard work, Leah!



After more than four years with SER, Membership & Communications Manager Leah Bregman left the organization in April 2015 to accept a new position with an association management firm in Washington, DC. Leah played a crucial role in strengthening the Society’s membership program and improving the services we offer to our members and partners, and she will be greatly missed. She started with the organization as an intern in 2011 to help with planning efforts for the SER2011 conference in Mexico, and during her time with SER, she grew into a highly capable association management professional with a bright future ahead of her. On behalf of the entire organization, we offer our deepest gratitude for her dedicated and passionate service to the Society’s members and its mission, and we wish her the best of luck on the road ahead!

The Chicago Wilderness Green Infrastructure Vision

Contributed by Jeffrey Mengler¹ and Nancy Williamson²

Chicago Wilderness (CW), a 20-year-old alliance of over 300 organizations, was formed around the concept that collaboration can accomplish more than working separately. CW member organizations have knowledge and expertise spanning all facets of conservation. From invasive species removal and land restoration, to childhood education and volunteer action, our efforts contribute significantly to the region's resiliency and economic vitality. Encompassing portions of 4 states, 38 counties, 500-plus municipalities, and over 10 million residents, the CW region also includes 545,000 acres of protected open space, 225 miles of Lake Michigan shoreline, and many unique natural resources.

CW's guiding document for the Alliance, published in 1999, is the [Biodiversity Recovery Plan](#). This plan outlines the steps necessary to achieve the overall goal of the CW collaboration – to protect the natural communities of the Chicago region and to restore them to long-term viability, in order to enrich the quality of life of its citizens and contribute to the preservation of global biodiversity.

While the Biodiversity Recovery Plan (BRP) contained great information and goals for conserving the natural resources of the region, CW members recognized the need to geographically visualize the BRP recommendations on the landscape. Resource experts from across the region came together, assembled available geospatial data layers and convened charrette-style workshops, resulting in the first Green Infrastructure Vision (GIV) in 2004. The process pulled together the immense local knowledge of more than 100 individuals, from federal, state and county resource managers and other conservation organizations who, during multiple meetings, laid out the network of natural landscapes across the region that would be needed to conserve the biodiversity described in the BRP. The network design followed the concept of cores, hubs, and corridors from Benedict and McMahon's book *Green Infrastructure: Linking Landscapes and Communities* (2006, Island Press). Recommendations were written for each hub – described as a "Resource Protection Area" – and the resulting map and report were published.

The CW definition of green infrastructure spans all scales of green infrastructure:

An interconnected network of natural areas and open space that conserves ecosystem values and functions that sustain our society and that connect across all scales of green infrastructure from site-specific practices to our regional plan.

This broad definition is consistent with the U.S. Fish and Wildlife Service, The Conservation Fund and also the U.S. Environmental Protection Agency definition, which includes this broad concept along with the narrower definition of constructed infrastructure features designed to mimic natural processes.

In October 2008, CW initiated a Green Infrastructure Vision Task Force, whose charge was to "create strategies and coordinate efforts to fully implement the Chicago Wilderness Green Infrastructure Vision throughout the Chicago Wilderness region." In order to implement this vision and guide conservation efforts, CW members would need to engage many partners, both

traditional and non-traditional. The Task Force first focused on internal target groups including ecosystem partnerships, CW member municipalities, professional societies/organizations, and councils of government. They then began formulating an outreach plan to influence local jurisdictions that control most of the region's land use decisions.

The Sustainable Watershed Action Team (SWAT) became a hallmark approach to implement the GIV. It relied upon peer-to-peer technical support to help local communities create their own stepped-down green infrastructure plan that included local priorities and local natural resource assets. With grant funding from various sources, CW was able to hire consultants on a partially pro-bono basis to provide technical assistance directly to communities. The SWAT process has been used in projects at a county, township, watershed, and municipality scale.

Concurrent with the early SWAT projects, CW worked to assist the Chicago Metropolitan Agency for Planning (CMAP) in integrating the GIV and its principles into their regional comprehensive plan, GOTO 2040, resulting in the first inclusion of ecosystem measures in the plan. The GIV was also adopted by the Northwest Indiana Regional Planning Commission. In 2010, as part of the recommendations within CMAP's GOTO 2040 plan, CMAP undertook refining the GIV, and retained The Conservation Fund to update the resource layers utilizing the latest in GIS technology. Initially completed for the 7-county CMAP planning area, CW and CMAP sought funding and extended it to include the entire CW region. It was completed in 2012 and led to revised maps and a complete geospatial database that was made available to any partners, members, or municipalities to use. The database included the capability to run analytical models to answer conservation priority questions.

In 2014, CMAP hired The Conservation Fund to complete a study of the economic value of the "ecosystem services" provided by the GIV network within their seven-county area. The study relied upon value-transfer rather than original research, but was able to assign monetary values to the following ecosystem services on a geographic basis: water flow regulation/flood control, water purification, groundwater recharge, carbon storage, and recreation and ecotourism. Relative values were also assigned for native flora and fauna. Though the values used were the most relevant found in a literature review and are conservative numbers, the completed analysis found that natural ecosystems contribute more than \$6 billion in 2014-dollars per year in economic value to the CMAP region.

The next steps for CW GIV are now being discussed. A key question moving forward is how best to keep the GIV geospatial database continuously updated and most readily available for use by organizations throughout the region.

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Chicago Botanic Garden Hosts a Research Symposium on Large-scale Ecosystem Restoration

Contributed by Kayri Havens and Julianne Beck - Chicago Botanic Garden, Glencoe, IL

Scientists and policymakers are increasingly calling for large-scale restoration of degraded lands, viewing ambitious efforts as vital for global biodiversity conservation. However, to date, ecological restoration has tended to operate at relatively small spatial scales—as has the research that informs restoration practice, e.g., plot-level field experiments. Chicago Botanic Garden’s annual Janet Meakin Poor Research Symposium, held June 12, 2015, tackled these issues and showcased examples of large-scale restoration efforts from around the world. Some of the questions that were explored include: What factors constrain the effectiveness of large-scale restoration efforts? How can adequate resources and institutional support be maintained to see large projects through to completion? What scientific gaps become limiting as we try to scale up restoration?



Assorted seeds from the Chicago Botanic Garden

The keynote speaker was BLM Acting Assistant Director, Amy Leuders, who discussed the development of the National Seed Strategy to collect, bank, and use native seed. She cited examples of events where seeds saved by chance allowed for the restoration of areas that later succumbed to natural disasters like wildfires and hurricanes. The agency’s new strategy will encourage seed banking to take place in a more proactive and systematic manner.

Kingsley Dixon, professor at Curtin University in Western Australia and SER Board member, noted that the current supply of wild seed cannot support global restoration demands. He discussed seed priming and pelleting that facilitates germination and establishment, thereby achieving in restoration the level of seed performance seen in the agricultural sector. He noted that, “Only by thinking at an industrial level of efficiency will ecological restoration be able to achieve the pace needed to protect and enhance natural resources.”

Joy Zedler of the University of Wisconsin-Madison shared examples of how restoration has been ‘scaled up’ adaptively (learning while restoring) to impact watersheds. She noted, “Our global society needs to redirect itself to achieve a sustainable future.”

Other speakers included Brian Winter of The Nature Conservancy, John Rogner from U.S. Fish and Wildlife Service, James Aronson from the Missouri Botanical Garden and SER, and Megan Haidet of Seeds of Success. All echoed the theme that large-scale restoration is necessary and achievable with proper investment.

SER Member Spotlight – Nancy Aten, Landscapes of Place



Following a twenty-year career as an electrical engineer (developing software for the design and analysis of integrated circuits), Nancy Aten explored both ecology-based and art-based second careers until finding ecological restoration via landscape architecture. With the help of her mentor, Darrel Morrison, Nancy found a customized graduate program that incorporated ecology, botany, physical geography, ecological restoration, and social sciences. Darrel's way of teaching plant community ecology in a three-week immersion field course was highly influential for Nancy. Being reconnected to her own geography of Wisconsin and the Midwest, arguably the soul of ecological restoration, Nancy

became acquainted with the pioneering ecological restoration luminaries of the region, including Henry A. Gleason and Frederic E. Clements; she learned about ecological succession via field study from Henry Cowles and May Thielgaard Watts; discovered John T. Curtis' *Vegetation of Wisconsin* (still consulted regularly) and John Weaver's prairies; and of course, read Aldo Leopold in a much deeper way.

Nancy's broad roots in ecological restoration are illustrated in a recent blog post, [A path for art in restoration](#), which was invited by the [SER Midwest-Great Lakes Chapter](#). Reading many of Bill Jordan's editorials in *Ecological Restoration* and his essays inculcated in her the importance of participatory restoration, and introduced alternative ways of thinking about restoration practice.

Now fifteen years into ecological restoration, Nancy, with her firm Landscapes of Place, has won awards from the American Society of Landscape Architects (ASLA), the ASLA Wisconsin Chapter, and Wisconsin Wetlands Association, and she continues to work on several multi-year projects.

In an urban brownfield project in Milwaukee's Menomonee Valley, she introduced SER's [Primer](#) and [Guidelines](#) to city stakeholders, and produced an award-winning [restoration plan](#) following the Guidelines and outlining six years of restoration tasks.

In a project spanning the past three years, Landscapes of Place developed a process for conservation planning that complements ecological restoration planning, applied to a 1700-ha Wisconsin State Natural Area (SNA) called Bay Shore Blufflands. The SNA contains three Preserves of a local Land Trust, but is largely privately owned. In this mosaic of working lands, residents, and ecological reserves, the process deliberately intertwined nature and culture so that inventive and attainable approaches could emerge. Two threads provided the framework:

(1) *Cathedral-building* gives the process the freedom to trust the collective vision, be knowingly incomplete, multi-generational, and non-linear. The metaphors encourage stakeholders to see the place as a laboratory, to think in terms of working incrementally and together, sharing good ideas, to plan for many steps of useful work that move the conservation vision forward. In this cathedral model, "[both theory and practice] are the product of local and tacit knowledge" (David Turnbull, *Masons, Tricksters and Cartographers*, 2000).

(2) *Pattern Language* (Christopher Alexander et al, *A Pattern Language*, 1977) is a familiar design approach, here applied to master planning. Expert knowledge is used to translate good conditions in highly regarded landscapes to this particular place, and then to identify the elements or steps that could create the condition over time.

These approaches enabled the multi-disciplinary team to bridge domains in generating ideas and plans. "The Bay Shore Blufflands Conservation Master Plan is a paradigm shift for Wisconsin planning efforts. This plan actively engages supporters with a purpose..." (Randy Hoffman, former Ecologist for the Wisconsin State Natural Areas Program, Author - *Wisconsin's Natural Communities*).

Projects undertaken in recent months illustrate her firm's spectrum of work with her partner, Dan Collins. One example involves ongoing field work implementing restoration tasks planned at an eighty-acre site in Kenosha in southeastern Wisconsin. Now in its fourth year, the project has included inventories, seeding, plug, tree and shrub planting, invasive species control, and monitoring. Landscapes of Place also published a paper recently on developing site-specific reed canary grass control protocols. Finally, Nancy and her firm designed an ephemeral public art installation, *Imprinted Paleolithic*, for a community pop-up art show in Sturgeon Bay, Wisconsin about redefining the city in a new paradigm. The piece "reflects both our human-constructed and primeval natural environs in Sturgeon Bay – the forested escarpment, the sunny cuesta, and structures and tools used by generations in Sturgeon Bay to imprint the natural world." Nancy and her firm see this new paradigm as intertwined with healthy, connected, restored ecosystems.

Nancy can be contacted via [Landscapes of Place](#).

Is burning enough? Rethinking woody management and fire for tomorrow: A manager's perspective

Contributed by Brad Woodson & Gabe Powers - McHenry County Conservation District, Richmond, IL

In northern Illinois and throughout the Midwest, land managers are tasked with preserving and restoring the rich floral and faunal diversity historically shaped by fire, ungulate grazing, climatic forces, (drought, temperature, and flooding) and the underlying geology. Excluding geologically unique communities, the highest floral diversity per area historically occurred on rich-soiled wetland, prairie, and woodland community boundaries. These "borders" were blurred by continual retreats and advances of grassland and woodland, driven by the repetitious, yet varied, fire and moisture regimes over time.

These broad-level forces dominated the landscape over thousands of years, while at the local level, the frequency and intensity of fire often shaped the extent and structure of woody species presence and dominance in a natural community. For instance, large, intense fires during severe droughts pushed woodland and shrubland communities into retreat from previous positions of advancement. This continual expansion-suppression in fire-dependent systems provided much of

the natural variation we observe and value today. Yet, the applicability of managing these landscape-scale, variable systems presents a challenge for managers when the goal is to maintain these communities in a state of stability or equilibrium.

Fire science has greatly expanded land managers' knowledge and ability to predict the effects of fire. Throughout the region, prescribed fire has become an accepted management practice for agriculture, forestry, wildlife, and natural areas management. Smoke modeling, predictive fire behavior, standardized training, and accurate weather forecasting allow land managers to conduct burning more safely and frequently than any time in the last century. While many fire-dependent natural areas have been reintroduced to burning, the current application of fire may be lacking in intensity when compared to its historic counterpart responsible for shaping natural community boundaries, diversity, and structure. Can land managers be expected to apply a landscape-level force, through prescribed fire alone, in a fragmented environment to meet our natural area management needs and expectations, or are additional energies necessary to meet management goals?

Contemplating this question requires an evaluation of the limitations to prescribed fire in today's environment and landscape. For example, the number of days managers can place fire on the landscape, often referred to as the "burn window," is limited annually to a few weeks in the spring and fall. According to our records, the number of burn days within the burn window averaged fourteen days in the spring season, and seven days in the fall, over the last five years. The limitations to a program's burn window are determined by assessing the short-term negative impacts to wildlife, endangered plants, and public use, as well as the benefits of each prescribed burn. Beyond the natural resource considerations of fire impacts, conducting prescribed fire in fragmented landscapes requires burning near roads, houses, schools, airports etc. Smoke management and public safety further restrict the type of burn a manager is able to conduct with regards to frequency, intensity, and duration of fire in these areas.

Further, state and local regulations set parameters and limitations on weather conditions in which they will allow prescribed burning. In addition to regulatory requirements, many agencies establish additional self-imposed limitations to further reduce liability. Many agencies will not burn when weather forecasts call for wind in excess of 20 mph or relative humidity below 20 percent. We are familiar with local fire departments that disallow prescribed fire when winds exceed 15 mph. Each manager in the Midwest operates with unique regulations specific to their location. The cumulative result is that prescribed fire does not occur at the intensity or scale required to shape the structure of the habitat managers are tasked with preserving.

Given current operational limitations, expecting prescribed fire to have the same woody-suppressing capabilities it did centuries ago will lead to disappointment. Based on twenty-five years of observation, the present use of prescribed fire, applied at small scales, with mild fire weather prescriptions, will not be enough to shift natural community dominance or drastically reduce the density of woody species in a typical woodland-shrubland community. Considering these limitations of placing fire on the landscape, managers must continually re-evaluate how prescribed fire will be utilized to manage natural areas.

Many land managers find it difficult to maintain or justify an annual or biennial burn rotation, so many default to a three- to four-year burn rotation for prairie communities. In this scenario, if one prescribed fire is marginal or low in intensity, there will effectively be a six- to seven-year

period where woody species can grow and expand unchecked. This, in combination with an extended period of above average rainfall or soil moisture, often results in brush growth that can no longer be managed by mild fire alone.

As we examine our future burn campaign, McHenry County Conservation District plans to continue monitoring fire effectiveness by evaluating fire prescriptions within regulatory parameters, adjusting fire return intervals, and strategically applying additional energies (mowing, herbicide, and grazing treatments) on the landscape to leverage the effectiveness of our prescribed burn program. Our goal is to preserve natural quality and to restore natural areas to a point of resiliency. The applicability of this goal with the use of modern prescribed fire alone remains questionable.



Photo 1: Brush invasion in a prairie restoration with a four year burn rotation



Photo 2: Brush re-sprout after fire



Photo 3: Brush clone intact after fire

Great Lakes Restoration Initiative

Comprised of more than 10,000 miles of coastline and 30,000 islands, the Great Lakes (Superior, Michigan, Huron, Erie, and Ontario) are the largest group of freshwater lakes on Earth and serve as an important source of drinking water, transportation, power, and recreational opportunities for more than 30 million people in the United States and Canada who call the Great Lakes Basin home. They hold 95 percent of the United States' surface freshwater and are essential to the economic vitality of communities across the region, supporting an abundant commercial and recreational fishery and vibrant agricultural sector, and generating an estimated \$18 billion in annual revenue. Moreover, the Great Lakes support a wealth of biological diversity, including over 200 globally rare plants and animals and more than 40 species that are found nowhere else in the world.

Unfortunately, more than a century of environmental degradation has taken a substantial toll on the Great Lakes. To stimulate and promote the goal of a healthy Great Lakes region, President Obama and Congress created the Great Lakes Restoration Initiative (GLRI) in 2009. The GLRI is an interagency collaboration that seeks to address the most significant environmental problems in the Great Lakes ecosystem. The GLRI is composed of the following five focus areas:

- Cleaning up toxic substances and Areas of Concern
- Preventing and controlling invasive species
- Promoting nearshore health and reducing nonpoint source pollution
- Protecting and restoring habitat and wildlife
- Monitoring and evaluating progress and developing strategic partnerships

The GLRI was launched in 2010 with an initial investment of \$475 million by the Obama administration and is being implemented through a partnership of 16 federal agencies in cooperation with states, tribes, municipalities, universities and other organizations. As of August 2013, the GLRI had funded more than 1,500 projects and programs of the highest priority to meet immediate cleanup, restoration, and protection needs. During fiscal years 2015-2019, federal agencies will continue to use GLRI resources to strategically target the biggest threats to the Great Lakes ecosystem and to accelerate progress toward long-term goals for this important resource.

The following is one of the many noteworthy projects being conducted under the Initiative.

Keweenaw Bay Indian Community Spearheads Aquatic Connectivity Project in the South Central Lake Superior Basin

By Joanna Gilkeson and Brad Potter (excerpted with permission from Restoring the Great Lakes: Success Stories from the 2014 Field Season – U.S. Fish & Wildlife Service)

Partners for Watershed Restoration, a coalition made up of more than 30 agencies and organizations, formed around the consensus that coordination among partners was needed to restore the connectivity of streams across the South Central Lake Superior Basin. Early on the group encountered a major setback when they turned to science to prioritize their region's aquatic connectivity projects – not enough scientific data existed. With approximately 1,800 stream crossings to consider, questions loomed about where to strategically place limited restoration dollars.



Lake Superior beach in upper Michigan. Photo by Joanna Gilkesonm - USFWS.

With funding support from the Upper Midwest and Great Lakes Landscape Conservation Cooperative, the Keweenaw Bay Indian Community will develop and bring relevant connectivity and barrier information to the collaborative restoration effort. The Keweenaw Bay Indian Community, with the U.S. Forest Service and the University of Wisconsin – Madison, are working together to bring the scientific information necessary to help the Partners for Watershed Restoration develop a unified vision for the efficient distribution of resources to restore watershed connectivity in the South Central Lake Superior Basin.

Work will include placing approximately 1,800 field inventoried stream crossings into a consistent geo-database. Once compiled, the data will enable the researchers to use optimization models to help prioritize aquatic barriers for restoration action. Additionally, a special remote sensing technology called LiDAR will help to further evaluate site conditions.

Many structural barriers like culverts, bridges and dams were previously evaluated in the region, but few natural barriers like waterfalls, beaver dams and forest roads have been reviewed. Natural barriers often receive limited consideration because they are more difficult to identify on

a traditional two-dimensional aerial map, and usually harder to visit in-person. LiDAR technology helps to overcome this by producing three dimensional digital terrain models that reveal the earth's surface beneath forest canopy to show unidentified roads and natural barriers. Using this technology, the project will place natural aquatic barriers into the context of regional and local site prioritization. By the end of the two year project, goals and strategies will be developed for aquatic resource restoration across the entire South Central Basin.

Not only is the Keweenaw Bay Indian Community developing a landmark geo-database for the South Central Basin, but they are also partnering with a University of Wisconsin effort to develop models for aquatic barrier prioritization across the entire Great Lakes basin. In combination, these efforts can demonstrate to other resource managers throughout the Great Lakes basin how to use these new tools to inform conservation decisions.

Stay tuned for progress as this project takes off the ground!

Sources used to compile this summary of the GLRI:

Great Lakes Restoration Initiative (2014). Great Lakes Restoration Initiative Action Plan II. <http://glri.us/actionplan/pdfs/glri-action-plan-2.pdf>.

U.S. Fish & Wildlife Service (2014). Restoring the Great Lakes: Success Stories from the 2014 Field Season. <http://www.fws.gov/glri/documents/GLRIBook2014.pdf>.

U.S. Geological Survey (2014). Great Lakes restoration success through science—U.S. Geological Survey accomplishments 2010 through 2013: U.S. Geological Survey Circular 1404, 58 p., <http://dx.doi.org/10.3133/cir1404>.

In Memoriam: Jackie Brookner 1945-2015



Jackie Brookner, a pioneering ecological artist and educator, died of cancer on May 15, 2015. She was 69. Jackie lived in New York City and worked and lectured internationally, receiving numerous commissions, awards, and grants including from the Nancy Gray Foundation for Art in the Environment and the New York Foundation for the Arts. She had a long career as a professor at Parsons The New School for Design and was also a visiting lecturer at Harvard in the Department of Visual and Environmental Studies (VES).

Jackie had become an increasingly important thinker – and actor – within the SER community in recent years, working to raise awareness among ecologists and restoration practitioners of the key role art plays in fostering more holistic understandings of restoration and helping to ensure that projects are successful and sustainable in the long term. Through her active involvement in the SER network, along with fellow ecological artists, Jackie helped convey the power of art as a tool for situating restoration in meaningful social, cultural and geographic contexts – thereby facilitating the ongoing engagement and support of local communities – and also as a means of addressing the causes and not just the symptoms of ecological degradation. In her own words:

Long-term success of ecological restoration, at all scales from the local to the global, necessitates transformation of the dominant ways humans understand, behave, value, and relate to natural processes and ecosystems. Artists and scientists can do more together to affect positive transformation than either can do separately. It is not a matter of the scientists providing the hard-core research and artists the soft outreach; rather, the dynamics engendered in the space between disciplines is full of information necessary to solve complex problems at the systemic level. Transdisciplinarity implicitly raises the issue of boundaries, which themselves are a rich territory to explore. What happens when one meets the edges of their expertise? These initially uncomfortable edges become fecund places of emergent creativity, similar to enhanced diversity in the boundary zones of ecosystems. Unforeclosed by disciplinary constraints, these places of open curiosity generate non-paradigmatic responses to problems....Transforming assumptions about these boundaries and their exclusions is foundational to sustained ecological restoration.

Born in 1945 in Providence, Rhode Island, Jackie received a BA in art history from Wellesley College in 1967 and completed all work for a PhD in art history at Harvard except for a dissertation before shifting her focus to sculpture in 1971. Her landscape-scale ecological art evolved from her sculptures and installations from the 1980s and early 1990s.

While conducting research as the guest editor of a special issue of *Art Journal* on “Art and Ecology” in 1992, she was inspired to develop a practice that could provide ecological benefits and help transform cultural values. This research led Brookner to develop her Biosculptures – living water filtration systems that unite the conceptual and aesthetic capacities of sculpture with ecological function. These sculpted wetland ecosystems are made of mosses and plants growing on stone and concrete substrates, and the water they filter is inhabited by fish, snails, plants, and other organisms.

Jackie actively collaborated with ecologists, engineers, policy makers, design professionals, and community residents to create multifunctional water remediation/public art projects. Among her recent major projects were Veden Taika (The Magic of Water), consisting of three man-made floating islands in Salo, Finland. Veden Taika was a collaboration with local volunteers, regional science experts, the students and faculty of the Salo Polytechnic Institute, the Salo Parks Department & Office of Environmental Protection, Biomatrix Water, and Finnish artist Tuula Nikulainen. Emblematic of her work, the islands provide nesting habitat for birds and plant-based filtration for improving water quality in the Salo Bird Pools, lagoons that were formerly used as part of the sewage treatment process. An abundance of migrating and nesting birds now use the lagoons, and the pools have been established as an EU-directive conservation site.

At the time of her death Brookner was working on a pilot project with The City of Fargo, ND to transform a neighborhood drainage basin into a community commons that will restore native plant communities and reflect the cultural vibrancy of the Fargo community, while preserving the basin's function as a stormwater collection site. Brookner had recently written to a friend: "After 5 years we are just breaking ground and there are years to go—but it is the most amazing and rewarding work I have ever done. Your wonderful questions will prod our thinking My own health is unfortunately quite fragile right now. I am not sure I will get to see this through, but none of us will get to do more than start the turning of the Great Wheel."

Jackie was a true champion of ecological restoration, and she will be missed.

Upcoming Events

[IUCN World Conservation Congress 2016](#)

The next IUCN World Conservation Congress will take place in Hawai'i, USA, from September 1-10, 2016. The Congress will bring together several thousand leaders and decision-makers from government, civil society, business, and academia with the goal of conserving the environment and harnessing the solutions nature offers to global challenges.

Proposals are currently being invited from delegates interested in participating directly in the Congress by organizing an event during the Forum – i.e. the part of the Congress open to the wider public, from 2-5 September. This Call for Contributions will remain open until October 15, 2015. More information is available on the [Congress website](#).

[SER2015 – 6th World Conference on Ecological Restoration](#)

Towards Resilient Ecosystems: Restoring the Urban, the Rural and the Wild
August 23-27, 2015 – Manchester, England

The Schedule at a Glance for SER's upcoming World Conference on Ecological Restoration in Manchester will be released on Monday, July 20th. Watch for further communications on or around that date announcing details about the sessions and speakers to be featured in the program. For an overview of the conference schedule and the different activities being offered, please visit: <http://www.ser2015.org/outline-programme>.

We are expecting to have 850-1,000 delegates in attendance and a dynamic mix of researchers, practitioners, policy makers, and industry professionals working in restoration and allied disciplines. Plenary speakers will include:

- Braulio Ferreira de Souza Dias – Executive Secretary of the UNEP Convention on Biological Diversity
- Alan Watson Featherstone – Founder & Executive Director, Trees for Life
- Germaine Greer – Author and Emeritus Professor at the University of Warwick

- Olivier Hamerlynck – Kenya Wetlands Biodiversity Research Team; IUCN Commission on Ecosystem Management
- John Rodwell – Professor of Plant Ecology, Lancaster University; Consultant for the European Commission’s Red List of European Habitats Project
- Jane Smart – Global Director, IUCN Biodiversity Conservation Group; Director, IUCN Global Species Programme

Online Registration

If you would like to attend the conference, you can register by visiting:

<http://www.ser2015.org/registration>. Online registration will remain open until mid-August, but we encourage you to confirm your participation as soon as possible.

Sponsorship & Exhibitor Opportunities

The deadline is approaching for sponsor and exhibitor registration. If your company, organization or institution would like to promote its products, services or activities at the conference, please contact us so we can ensure that you receive maximum visibility in the program. To learn more about available sponsorship and exhibitor opportunities, please [click here](#).

SER Chapter Conferences & Events

SER Ontario Field Trip Program

SER Ontario is offering three field trips this field season as part of its long-standing Field Trip Program. These trips provide unique networking and learning opportunities for practitioners, educators, students, governmental agencies, conservation groups, and the public. For more information, visit: <http://chapter.ser.org/ontario/activities/field-trips/>

SER Southeast Annual Meeting

*Mine Reclamation and Mussel Relocation
October 14-16, 2015 – Knoxville, Tennessee*

SER Texas Annual Meeting

*Celebrating 20 years of Ecological Restoration in Texas
November 13-15, 2015 – Trinity University, San Antonio, Texas*

SER Southwest Annual Meeting

November 20-22, 2015 – Tucson, Arizona

SER Northwest Annual Meeting

*Monitoring Ecological Restoration
April 2-6, 2016 – Portland, Oregon*

SER Western Canada – GOERT Conference

*SER Western Canada Chapter and the Garry Oak Ecosystems Recovery Team
May 2-6, 2016 – University of Victoria, Canada*

New Publications

[Restoration is Preparation for the Future](#)

Brice Hanberry, Reed Noss, Hugh Safford, Stuart Allison, Daniel Dey

In this new, thought-provoking publication from the *Journal of Forestry*, Hanberry et al. address the importance of the concept of ecological restoration in preparing forests and other ecosystems in an age of “rapid global change.” So long as restoration is approached with a flexibility that allows for unknown future conditions, and is not tied to some immovable historical reference point, the authors assert that “there is no inherent incompatibility between restoration and management for global change.”

[Connecting Global Priorities: Biodiversity and Human Health, a State of Knowledge Review](#)

From the United Nations Environment Programme (UNEP), Convention on Biological Diversity (CBD), and the World Health Organization (WHO)

In this report, human health is inextricably linked to biodiversity and ecosystem functioning at multiple temporal and spatial scales. Drivers of biodiversity loss such as land use change, pollution and climate change have direct impacts on human health, but also influence human health through their negative consequences for biodiversity. This review provides eye-opening evidence for the role of biodiversity in air and water quality, food availability, and the spread of disease.

[Committing to Ecological Restoration](#)

Katharine Suding, Eric Higgs, Margaret Palmer, J. Baird Callicott, Christopher B. Anderson, Matthew Baker, John J. Gutrich, Kelly L. Hondula, Matthew C. LaFevor, Brendon M.H. Larson, Alan Randall, J.B. Ruhl, Katrina Z.S. Schwartz

In the wake of increased pledges worldwide to restore degraded ecosystems, the authors of this recent publication in the journal *Science* urge those planning ecological restoration to carefully consider what it means to restore. Suding et al. present four principles to contemplate before undertaking ecological restoration in order to assess the intent of a given project.

Recent Reviews:

[Project Planning and Management for Ecological Restoration](#)

By John Rieger, John Stanley, and Ray Traynor

Title from SER's Science and Practice of Ecological Restoration series

Conservation Biology Book Review (Volume 29, No. 2): “This is a hands-on, how-to guidebook intended for practitioners and as a complement to restoration textbooks. Based on a 4-phase project model—planning, design, implementation, and aftercare—the authors lay out the manifold details of restoration projects in a logical, straightforward, and easily readable sequence. The final chapters demonstrate how to put all these elements together through the example of a successful restoration project. A welcome touch is a substantial set of appendices

that will help restoration practitioners develop everything from project cost estimates to site analysis checklists.”

Excerpt from *Restoration Ecology* Book Review (Volume 23, No. 3): “I heartily recommend this book as a text for anyone interested in improving their restoration project outcomes. This is an excellent textbook for university students interested in restoration. Similarly, it could make a large contribution to the field as a library resource for regulatory and resource agency staff and NGOs responsible for funding, managing, or permitting restoration projects. Finally, as a practitioner in the consulting industry, I think this book would be an asset to practitioners responsible for restoration project planning, design, implementation, and monitoring.” – Joe Berg, Biohabitats, Inc.

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***Restoration Ecology* Volume 23 Issue 3**

The May 2015 issue of *Restoration Ecology* (Vol. 23, Issue 3) is available online. Featured below are some “Editor’s Picks” from the issue, courtesy of Editor-in-Chief and Managing Editor of *Restoration Ecology*, Stephen Murphy and Valter Amaral.

New article categories in *Restoration Ecology*

Restoration Ecology fosters the discussion and interchange of ideas among the various bodies of knowledge involved in the science and practice of restoration. To stimulate the involvement of the research community in the decision-making, monitoring, planning, implementation and learning perspectives of restoration, we have created the categories '**Policy/Practical Articles**' and '**Strategic Issues Articles**' as forums for communication. We have also formalized the category '**Response Articles**' to facilitate a rapid debate on crucial and timely advances in theoretical and practical aspects of restoration paradigms. Familiarize yourself with the new article categories [here](#).



[Indicators of restoration success in riparian tropical forests using multiple reference ecosystems](#)

Marcio S. Sukanuma and Giselda Durigan

Forest restoration that includes tree planting accelerates vegetation succession. However, the final state of the restored ecosystem (similarity to reference system, alternate state, novel ecosystem) and the associated successional trajectories remain understudied and contentious among researchers. In this study, the authors use a chronosequence of the numerous restoration projects of riparian Atlantic Forests in Brazil to investigate predictive models, validate ecological indicators of forest restoration and assess the time required for these to reach

different types of reference ecosystems. Desirable structural attributes are generally attained faster than community attributes, and Suganuma and Durigan conclude that canopy cover, basal area, sapling density, and understory richness are the best indicators of successful forest restoration.

Do not neglect surroundings in restoration of disturbed sites

Karel Prach, Petra Karešová, Alena Jírová, Helena Dvořáková, Petra Konvalinková and Klára Řehouňková

Spontaneous colonization from the surroundings of a restoration site can influence vegetation succession positively if desirable target species are involved, or negatively when less desirable species (invasives or competitors) are the colonizers. Here, the authors combine the results of previous studies to show significant proximity effects in several different types of human-disturbed sites, with the exception being wetlands because of the long distance dispersal of their species. They also compared several limestone quarries with their surroundings, which were always more similar than the quarries were to each other. Restoration measures extending to surrounding sites, and particularly up to 100-meter distance, are recommended because colonization from the outside will always influence restoration results.

The role of trust in restoration success: public engagement and temporal and spatial scale in a complex social-ecological system

Elizabeth Covelli Metcalf, Jakki J. Mohr, Laurie Yung, Peter Metcalf and David Craig

This study investigates the social perspective in one of the largest river restoration projects ever attempted: the Upper Clark Fork River in Montana, USA. Through interviews with stakeholders, Metcalf and colleagues identified the role and importance of trust in the restoration process and outcomes. A clear message is that trust needs to be 'gained' or 'built' for the project to be successful. Stakeholder frustration with the long timeframes necessary to observe restoration objectives must be addressed when building trust in restoration project. Using pilot projects on smaller spatial scales to demonstrate success may be a good strategy as it strengthens the dialogue between the community and organizations.

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Restoration Ecology Press Release

Defining and Evaluating the Ecological Restoration Economy

By Todd BenDor, Associate Professor, University of North Carolina at Chapel Hill

For decades, industry groups and many media outlets have popularized the notion that environmental protection is bad for business. Drawing particular scrutiny have been regulations or public programs that require ecosystem restoration, which is often required to offset some of

the environmental impacts of certain types of development, agricultural practices, or other human activities. For example, recent debates over important issues like domestic climate policy and the expansion of the US Clean Water Act have centered on the economic impacts of expanded restoration requirements, with several industry-sponsored reports suggesting a strong negative impact on our economy and on job production.

However, few rigorous studies have informed this public debate with a detailed accounting of the economic impacts and employment that are created through conservation, restoration, and mitigation actions. In a new study published in the journal *Restoration Ecology*, researchers at the University of North Carolina at Chapel Hill, Yale, and a private equity firm, reviewed all previous studies in this area. This includes 14 local and state-level case studies of privately funded environmental restoration projects, as well as a survey of numerous federal and state government programs that fund restoration throughout the United States.

Labeling the economic and employment impacts of this emerging sector collectively as the "Restoration Economy," they found growing evidence that the restoration industry contributes to national economic growth and employment, supporting as many as 33 jobs per \$1 million invested. They also determined that this emerging sector supports between 1.48 and 3.8 jobs for every restoration job (an "employment multiplier"), which helps to understand the ripple effect of every new job created. They also determined that for every dollar invested, the restoration industry generates between \$1.60 and \$2.59 in total economic output.

Efforts of previous scholars in this area have shown that investments in ecological restoration lead to significant positive economic and employment impacts and appear to have very localized benefits, which can be attributed to the tendency for projects to employ local labor and materials. While these initial figures shine light on another side of the debate over expanding restoration requirements, the full impacts of restoration at a national level could benefit significantly from further study.

The article is available in *Restoration Ecology* Vol. 23, No. 3, pp 209-219, and [online](#).

Contact: Todd BenDor, Associate Professor, Department of City and Regional Planning, University of North Carolina at Chapel Hill, 919-962-4760, bendor@unc.edu

Restoration in the News

In each issue we highlight news articles and restoration-related happenings from around the world. Use the [interactive map](#) to quickly navigate through our selection of news stories, or browse through the detailed listing below.

[**Rwanda: New Campaign to Preserve Natural Resources Launched**](#)

By Jean Mugabo for AllAfrica

Rwandan government ministries have joined together to form a campaign that aims to ensure food security through landscape restoration.

[Mixed Initial Responses to Final US Clean Water Rule](#)

By Kellie Barrett for Ecosystem Marketplace

This article explores first impressions from various stakeholders on the pros and cons of the new Clean Water Rule.

[Trust to Create Citizen Groups to Restore Wetlands](#)

By K. Lakshmi for The Hindu

Biodiversity research organization Care Earth Trust is working to educate citizens across the region of Chennai, India about the need to restore wetlands within the city and beyond.

[EPA Regional Administrator Visits Queens Park to Spotlight the Importance of Protecting Wetlands](#)

By John Martin for epa.gov

To mark the release of the Clean Water Rule, EPA Regional Administrator Judith Enck visited NYC parks where EPA-funded wetland restoration was under way.

[Wetlands Project Heralded for Beach Pollution Reduction](#)

By Tom Henry for The Blade

An engineered wetland restoration project in Toledo, Ohio has succeeded in reducing dangerous bacterial spikes that had been caused by animal waste runoff.

[Saving the Endangered Chinese Swamp Cypress](#)

By David McGuire for Earth Island Journal

A National Geographic expedition sets out to document a newly discovered population of the endangered Chinese Swamp Cypress.

[Waikato Forest Reserve 'Here to be Loved' - Peter Hillary](#)

By Mike Mather for Waikato Times

Edmund Hillary's restoration work and vision live on in the opening of a New Zealand forest reserve that bears his name.

[Bethany's living shoreline a buffer to waves, flooding](#)

By Molly Murray for DelawareOnline

An innovative living shoreline demonstration project aims to reduce flooding and erosion at Bethany Beach, Delaware.

[From the Mississippi to the Tigris: River restoration lessons travel far](#)

By Shannon Cunniff for the Environmental Defense Fund

Sharing restoration knowledge around the world: Iraq looks to lessons learned in the Colorado River Delta to inform restoration of its Tigris River marshlands.

[**A Remarkable Recovery for the Oysters of Chesapeake Bay**](#)

By Rona Kobell for Yale e360

After being decimated by disease, pollution, and overharvesting, the Chesapeake Bay's oysters are thriving once again, thanks largely to a selectively bred oyster that grows rapidly and is more resistant to pathogens.

[**Ecological Restoration Must Be Held to More Robust Standards, says Interdisciplinary Team of Scholars**](#)

By Melissa Andreycheck for SESYNC

Broadly accepted standards for ecological restoration are needed to ensure that intended goals and commitments are met.

* *See the Science article in the New Publications section above.*

[**Australia's Largest Pink-tailed Worm-lizard Habitat Restoration Project Underway to Save Threatened Species**](#)

By Alkira Reinfrank for ABC News

Threats from urban development have prompted a large-scale restoration project to protect Australia's pink-tailed worm-lizard.

[**US-Mexico Water Pact Brings Life Back to Colorado River's Parched Delta**](#)

By Tim Gaynor for Al Jazeera America

The Colorado River reaches the sea for the first time in years after a pact between the United States and Mexico.

[**NOAA Announces Long-term Gulf of Mexico Ecosystem Research Priorities**](#)

From noaa.gov

NOAA details ten long-term research priorities for the Gulf of Mexico, which include addressing the needs of fisheries and other natural resource-related economies in the Gulf.

[**After The Boom, Bringing Back the Forests**](#)

By Marie Cusick for Inside Energy

Researchers explore techniques for restoring well pads following the Marcellus Shale gas boom in Pennsylvania.

[**Tomales Bay Revival**](#)

By John Kelly and Jules Evens for Bay Nature

Following the removal of levees in 2008, Tomales Bay in CA has experienced remarkably fast recovery.

[What's it worth? New project aims to nail down the value of wetlands](#)

By Jeff Melchior for Alberta Farmer Express

An innovative new project uses the concept of reverse auctions that allow landowners to name a price for giving up acres to wetland restoration.

[Gambler-Turned-Conservationist Devotes Fortune To Florida Nature Preserve](#)

By Melissa Block for NPR

Florida native M.C. Davis used his gambling fortune to preserve and restore the largest block of private conservation land in the southeastern US.

[Restored Streams Take 25 Years or Longer to Recover](#)

From Umea University for phys.org

Researcher Eliza Maher Hasselquist uses a chronosequence of stream restoration projects in Sweden to monitor ecosystem recovery.

[Researcher Seeks to Maximize the Health of Native Plants in Restored Environments](#)

From University of California Irvine for phys.org

Is local better? Restoration ecologists put that question to the test with mycorrhizal fungi and ecological restoration.

Social Media Corner

Check out the lively LinkedIn discussions below and become an active participant by joining the Society for Ecological Restoration Group on LinkedIn [here](#). You can comment on an existing discussion topic or start one of your own!

LinkedIn Discussions

Below, we have previewed recent posts from SER's LinkedIn Group. Preview text is provided from posts to SER's group and does not represent the views of the Society. SER does not endorse the subject matter of individual posts or products.

Federal government spends \$700M on salmon habitat restoration

Hydroelectric dams, pollution and overfishing are all blamed for a diminishing salmon population, and the federal government has spent \$700 million to restore the fish habitat along the Columbia River in Oregon,

Washington, Idaho and Montana. The project has restored 2,800 miles of habitat, but most of the fish that have returned were born in hatcheries, not the wild.

[Read More and/or Comment](#)

Galápagos rebellion against foreign investment in hotels, golf courses, luxury tourism

Residents of Ecuador's Galápagos islands are mounting angry protests against government plans to open the World Heritage Site to foreign investment in luxury tourism and hotels, writes Jane Shaw.

[Read More and/or Comment](#)

Blog Posts

In keeping with the Midwestern theme of the newsletter, check out these great regional blogs from some area restorationists.

[Prairie Restorations, Inc. Blog](#)

The folks at Prairie Restorations, Inc., a Minnesota restoration company, draw on their years of experience to share restoration tips and seasonal observations of working in the Midwest.

[Driftless Prairies: Restoration in Progress](#)

Follow the journey of Jim and Marci Hess as they restore their property in the Driftless Prairie region of Wisconsin and blog about the trials and successes that they encounter along the way.

Connect with us!



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