

SAT – CO3:

Greenways to Gene-Ways: A Call to Action

SESSION OVERVIEW:

Habitat ranges of many species are altered as climate change continues. As temperatures and precipitation patterns shift, ecosystems adjust, causing many species to alter their feeding and reproductive behaviors. For some species, this means moving outside their historic ranges. For others, it means extinction. This session is a **Call to Action** on how a national greenway – and gene-way - network can serve to facilitate species migration in response to rapidly changing landscape conditions.



LEARNING OBJECTIVES:

- 1) Understand the importance of connected migration corridors and learn the meaning and definition of “gene-ways.”
- 2) Understand the history of America’s system of greenways and trails that have determined corridor establishment.
- 3) Consider the plight of plants and animals as climate change disrupts historic ecosystem synchronicities.
- 4) Gain insight into opportunities and strategies landscape architects can use to advance the gene-way development.
- 5) Participate in discussion regarding solutions and next steps.

PANELISTS

Overview and Call to Action



Vaughn B. Rinner, PLA, FASLA, SITES AP vaughn@vaughnrinner.com
Director, VRLA

Vaughn Rinner, PLA, FASLA, SITES AP is a landscape architect based in Seattle, Washington. Vaughn has over forty years of private practice experience in both small landscape architectural firms and as a partner in interdisciplinary firms. Her management of a wide variety of project types has given Vaughn a broad understanding of the opportunities and challenges landscape architects face in both private and public practice. A Past President of the American Society of Landscape Architects, Vaughn has spoken widely about the importance of landscape architecture in addressing the impacts of climate change on the natural and built environment.

Historical Framework: National Greenway System



Charles A. Flink, FASLA, PLA chuck.flink@greenways.com
Founder, Greenways, Inc.

Chuck Flink is an award-winning author and landscape architect and founder of Greenways Incorporated. He is widely regarded as one of America's leading greenway designers, having completed greenway, trail, and green infrastructure projects in more than 250 communities within 36 States. He has also been a consultant to clients in Europe, Asia and South America. He is a fellow in the American Society of Landscape Architects, serves on the East Coast Greenway Alliance National Advisory Board, and is Executive in Residence in the College of Design at North Carolina State University.

Greenways to Gene-ways Implementation Strategies



Keith Bowers, FASLA, PLA kbowers@biohabitats.com
President, Biohabitats

For over three decades, Keith Bowers has been at the forefront of applied ecology, land conservation and sustainable design. As the founder and president of [Biohabitats](http://Biohabitats.com), Keith has built a multidisciplinary organization focused on conservation planning, ecological restoration and regenerative design. Keith is a founding board member of the University of Pennsylvania's Ian L. McHarg Center for Urbanism and Ecology. He also served on the board of the Society for Ecological Restoration and Wildlands Network boards. He is a Fellow of the American Society of Landscape Architects and is a Professional Wetland Scientist.

Climate Change Disrupts Ecosystems

As landscape architects, we know that we humans are just one component of earth's living cyclic systems. We also know that everything changes, all the time. Our plans, designs, and ongoing care for places are never static.

Scale and time are both important to our work; they are also challenging to comprehend. In many ways, change seems slow and gradual, and we can even be impatient to have our designed places develop and grow. In a longer timeframe, plants and animals evolve, stone and soil develop and change, and we know that the earth itself has moved through many different states. Humans (*Homo sapiens*), along with many animals and plants we know today, evolved during the Holocene.

Our influence on the earth's atmospheric, hydrologic and geomorphic processes suggest that we may be entering a new geologic epoch – the Anthropocene. Human activities are causing global changes to the planet's ecosystems that are rapid and, in many ways, irreversible. As a result, many animals and plants are struggling to adapt to these accelerated changes. There is also growing evidence that the earth is entering what many scientists now call the sixth extinction.

There is an urgent need for an expanded concept of greenways to facilitate unencumbered movement of flora and fauna across the landscape. These greenways, or “gene-ways”, can provide a connected network to support the movement and migration of plants and animals to places where they can continue to evolve and adapt to new conditions. Helping to plan for and design these corridors is one of the many ways that landscape architects can have a positive impact on biodiversity as the earth continues to warm.

Patterns of land development, agriculture, and resource extraction, along with unsustainable zoning and building standards continue to contribute to fragmentation of natural areas, even while corridor planning becomes ever more popular in urban and rural communities. Riparian corridors serve as major routes for wildlife movement and migration, while also providing a host of other ecosystem functions, including flood attenuation, groundwater recharge, water quality enhancement and temperature modification. A regional or watershed-based approach to landscape planning is necessary to reconnect fragmented habitat, but is often difficult due to land ownership, jurisdictional boundaries, and shifting priorities. Green infrastructure, when viewed in a holistic perspective as strategically planned and managed networks of varied scales and types of green spaces, can serve to reconnect fragmented habitat, conserving and restoring ecosystem functions and also reinforcing human relationships with the land.

Planning for corridors linking habitat and design water management systems in adjacent districts can help to address multiple physical, social and economic issues. At the same time, even a small site should not be looked at in isolation. Landscape architects need to consider how every site and every project might contribute to reconnecting fragmented habitat.



(Photo: Stonehouse Greenway, VA, VRLA)



(Photo: Keith Bowers)

Challenges and Opportunities for Landscape Architects

Conflicts exist where intense recreational use disturbs animal populations. There have been many studies about the impact of roads on plant and animal movement and the continuity of natural areas. We need to collaborate with scientists to implement the findings of research, and we need to experiment to find the most effective methods to create gene-ways. This requires performance monitoring and continuous adjustment. Landscape architects need to be part of the research and testing of potential solutions. We no longer have time to make certain exactly how an idea works before we implement research findings. We need to experiment, and we need to track the results to be able to identify the many ways we can help plants and animals, including human communities, to adapt to an accommodate change.

Historic Framework: America’s Greenways and Trail Corridors

The concept of a national network of greenways in the United States has been around for a long time. Arguably, Frederick Law Olmstead was the first to put forward this idea, and Warren Manning mapped a concept of National Recreation Ways throughout his career. The National Trails System Act was passed in 1968, providing a network of trail greenways to provide recreation and public access to natural and historic resources. In 1985, a Presidential Commission on Outdoor Recreation issued a report *Americans Outdoors: The Legacy, The Challenge* that included case studies of public trail networks. Greenways and trail connectors continue to grow across the country, both for hiking and for bicycles, but also for conservation value.

Along with expanded trail networks, the need for linear greenways as corridors for plant and animal species is increasingly recognized, and systems are growing. Pollinator pathways are developing, particularly in urban areas where there is often a lack of continuous routes needed for the specialized pollination of plants. Transportation projects include not only trails, but crossings for animals to continue traditional migration patterns and to provide access to water and food resources.



(Source of Photo: US Department of the Interior)

Models for Conservation Corridors and Gene-ways

Gene-ways offer an expanded approach to corridor conservation planning, design and development. This is an emerging field for landscape architects and landscape ecologists, who can pair expertise and talents with other conservation professionals to implement impactful projects that provide multiple ecosystem benefits.

One challenge is linking local greenways to state, regional and federal corridors. Landscape architects work at a range of scales providing conservation corridor planning and design across North America, and it is important to become aware of existing and proposed greenways at all levels in the areas where we are working. There are also different opportunities for connectivity in different parts of North America. The Western areas of the United States have a greater opportunity to link greenspaces due to larger areas of public lands and reduced levels of development and disturbance. However, considerable opportunity has been identified in the Southeastern United States to reconnect natural areas.



(Photo: NW Arkansas Regional Greenway, Greenways Incorporated)



(Photo: Wolf River Greenway, Memphis, TN, Greenways Incorporated)

A Call to Action

In February 2019, with considerable support from ASLA members, the US Senate passed a public lands package with a bipartisan vote of 92-8, indicating a strong level of support for conservation lands. New bills for corridors were also signed into law in 2019 in New Mexico, Oregon and New Hampshire. The Wildlands Network is one example of organizations working to expand wildlife corridor legislation, working on model legislation that is tailored for every state, as well as continuing to work at the federal level to encourage federal corridor legislation. Landscape architects need to work with organizations that are promoting corridor protection and development at all levels, from federal to state to regional to local community actions in order to grow and support this critical aspect of climate change action.

REFERENCE MATERIAL/SOURCES

Organizations:

- Climate Adaptation Knowledge Exchange, <https://www.cakex.org/>
- Climate Central, <https://www.climatecentral.org/>
- Conservation Corridor, North Carolina State University, <https://conservationcorridor.org/>
- EcoAdapt, <http://www.ecoadapt.org/>
- International Association of Landscape Ecology, <http://www.landscape-ecology.org/>
- Mountains to Sound Greenway Trust, <https://mtsgreenway.org>
- Society for Conservation Biology, <http://www.conbio.org/>
- The Nature Conservancy, <https://nature.org>
- Wild Lifelines; <http://www.twp.org/what-we-do/scientific-approach/wild-lifelines>
- Wildlands Network; www.twn.org
- Yellowstone to Yukon Conservation Initiative; www.y2y.net

Books:

- After Nature: A Politics for the Anthropocene**, Jedediah Purdy, Harvard University Press 2015
- Big, Wild and Connected**, John Davis, Island Press 2013
- Climate Savvy: Adapting Conservation and Resource Management to a Changing World**, Lara J. Hansen and Jennifer R. Hoffman, Island Press 2011
- The Ecology of Greenways, Design and Function of Linear Conservation Areas**, Hellmund and Smith, Island Press 1993
- Grand Canyon for Sale: Public Lands Versus Private Interests in the Era of Climate Change**, Stephen P. Nash, University of California Press 2017
- Greenways A Guide to Planning, Design and Development**, Flink, et. al, Island Press 1992
- New Concepts, Models, And Assessments of Climate-Wise Connectivity**, Annika T H Keeley, David D Ackerly, D Richard Cameron, Nicole E Heller, Patrick R Huber, Carrie A Schloss, James H Thorne and Adina M Merenlender, IOP Publishing Ltd 2 July 2018
- Rewilding North America**, Dave Foreman, Island Press 2004
- Rewilding the World, Dispatches from the Conservation Revolution**, Caroline Fraser, Picador 2009
- The Spine of the Continent**, Mary Ellen Hannibal, Lyons Press 2012
- Trophic Cascades: Predators, Prey, and the Changing Dynamics of Nature**; John Terborgh and James A. Estes; Island Press 2010
- The Wolfs Tooth**, Cristina Eisenberg, Island Press 2011

Articles:

- A Simple Idea Could Help Wildlife Survive Climate Change**, Climate Central 2016, <https://www.climatecentral.org/news/wildlife-climate-change-adaptation-20436>
- Achieving Climate Connectivity in a Fragmented Landscape**, McGuire JL et al 2016, PNAS 113 (26):7195-7200, www.pnas.org/cgi/doi/10.1073/pnas.1602817113
- Climate Change and Connectivity: Are Corridors the Solution?**, Sarah-Taissir Bencharif April 2010, <https://www.researchgate.net/publication/228723885>
- Making Habitat Connectivity a Reality**, Annika T H Keeley et al 19 June 2018, <https://onlinelibrary.wiley.com/doi/abs/10.1111/cobi.13158>
- New Concepts, Models and Assessments of Climate-Wise Connectivity**, Annika T H Keeley et al 2018 Environmental Research Letters, <https://doi.org/10.1088/1748-9326/aac85>
- The Planet is Heating up Faster Than Species Can Migrate**, Marlene Cimon 2016 <https://nexusmedianews.com/the-planet-is-heating-up-faster-than-species-can-migrate-10cb4a7f1a5a>
- Plants Find a New Way to Fight Climate Change – Nap**, Marlene Cimon 2018 <https://nexusmedianews.com/plants-find-a-new-way-to-fight-climate-change-nap-4cd16944bf3f>
- Resilience in Land Management Planning: Policy Mandates, Approaches, and Resources.** Thomas Timberlake, Courtney Schultz, and Jesse Abrams 2017, University of Oregon Ecosystem Workforce Program Working Paper 77, https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_77.pdf
- To Preserve US National Parks in a Warming World, Reconnect Fragmented Public Lands**, Stephen P. Nash, <https://theconversation.com/to-preserve-us-national-parks-in-a-warming-world-reconnect-fragmented-public-lands-105926>
- Trails on Trial: Which Human Uses are OK for Protected Areas?** Bill Laurance and Savid Salt, <https://theconversation.com/trails-on-trial-which-human-uses-are-ok-for-protected-areas-105742>
- SER Primer on Ecological Restoration;** <http://www.ser.org/pdf/primer3.pdf>

Websites:

- Crucial Areas Planning System (CAPS): Identifying Critical Areas and Fish and Wildlife Corridors in Montana.** <http://fwp.mt.gov/gis/maps/caps/>
- ESRI Green Infrastructure.** <https://www.esri.com/en-us/industries/green-infrastructure/overview>
- The Nature Conservancy Conservation Gateway.** <https://www.conservationgateway.org/conservationbygeography/northamerica/unitedstates/edc/reportsdata/terrestrial/resilience/pages/default.aspx>
- University of California Conservation Planning, Research and Extension Field Studies and Habitat Connectivity;** https://ucanr.edu/sites/merenlender/Research_Areas/Field_Studies_and_Habitat_Connectivity/

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NOTES:

