CONSERVING NATURE IN A CHANGING CLIMATE

A Three-Part Guide for Land Trusts in the Northeast

A publication of the Open Space Institute and the North Atlantic Landscape Conservation Cooperative.
conserving nature in a changing climate
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PREFACE

Across the Northeast, biodiversity thrives in the places generations before us had the foresight to conserve. Yet shifts in climate are changing the ground rules. As land protection professionals, how can we be sure that our work today will still be relevant in 50 to 100 years — and beyond?

Conserving Nature in a Changing Climate offers a modular, user-friendly approach to addressing this challenge. It is a practical guide that contains tools and strategies to help land trusts conserve the lands most likely to harbor wildlife, and to protect natural resources under a changing climate.

Insights conveyed through the guide come in part from the Open Space Institute’s (OSI’s) Resilient Landscapes Initiative, which has mobilized land trusts to develop nearly 20 climate-inclusive conservation plans covering all or part of nine states, and to conserve 37,000 acres of climate-resilient lands across the eastern United States; from the North Atlantic Landscape Conservation Cooperative (LCC), which is using regional data and mapping to coordinate NGO, federal, state, and local governments responses to climate change; and from an advisory committee of practitioners and experts (listed in Appendix C).

OSI wishes to thank the U.S. Department of the Interior, Fish and Wildlife Service, which provided critical funding for the development of this guide. Special thanks also to the Doris Duke Charitable Foundation, lead funder of OSI’s Resilient Landscapes Initiative, Jane’s Trust, and the New York Conservation Partnership Program for their additional support and their vision to translate climate science for land trusts. Additionally, without the groundbreaking work of Mark Anderson, Ph.D., Eastern Regional Director for Conservation Science at The Nature Conservancy, and Kevin McGarigal, Ph.D., Director and Professor of the Department of Environmental Conservation at the University of Massachusetts Amherst, and their colleagues, these approaches for identifying climate-resilient lands for protection would not be possible. The guide was greatly improved thanks to review by the Steering Committee and land-trust practitioners.
INTRODUCTION

Throughout the Northeast, communities and ecosystems are experiencing climate change and grappling with its unknowns. How much will temperatures rise and how quickly? How will floods and droughts affect our food, our homes, and large-scale infrastructure such as roads and rail lines? Will plants and animals be able to adapt in time?

Despite this upheaval, scientists agree: land protection is, and will remain, a key strategy for ensuring that natural systems, and the species and humans that depend upon them, will continue to thrive. While changing weather patterns, species distributions, and other factors will affect the location of plants, animals, and their habitats, land trusts play an important role by protecting so-called “climate-resilient landscapes” and conserving carbon-storing forests and wetlands.

Conserving Nature in a Changing Climate provides a resource for land trusts and other conservation organizations to fulfill their critical missions, even in the face of so many unknowns. With a basic knowledge of relevant climate science and the tools described in this guide, conservation leaders can both revise their land protection goals if appropriate, and confidently explain to funders, board members, and landowners why their efforts matter now more than ever.
PUTTING A NEW SCIENCE INTO PRACTICE

Consider news footage from the aftermath of a hurricane or other natural disaster. The damage can seem remarkably uneven, with winds ripping up soil and trees in one area, while just a few hundred yards away a grove of trees stands tall and relatively unscathed.

What is the difference between these two places—and with the growing imperative of climate change, how can society harness the characteristics of the more resilient areas?

Over the last decade, ecologists have been working to identify characteristics that make a place more resilient to climate change. Building off this science, the US Fish and Wildlife Service and the North Atlantic Landscape Conservation Cooperative (LCC) have highlighted the critical role of land trusts to protect priority resilient sites for wildlife adaptation to climate change.

Starting in 2012, OSI’s Resilient Landscapes Initiative, funded by the Doris Duke Charitable Foundation (DDCF), began to use the cutting-edge science to mobilize land trusts to protect resilient lands across the eastern US. In 2014, President Obama commended the Initiative for its investment in natural infrastructure, citing our nation’s “moral obligation” to future generations to protect resilient landscapes.

In 2015, OSI began a partnership with the North Atlantic LCC and the Land Trust Alliance to collaboratively translate and disseminate the science more widely to the land trust community. Using this guide, your land trust, too, is becoming an important part of the solution for helping to mitigate the effects of climate change.
PLANNING FOR RESILIENCE

As a land conservation professional, you are likely familiar with the planning cycle for assessing land acquisition priorities (Figure 1).

While these planning best practices have been forged in response to traditional threats such as increasing fragmentation and development, climate change is a critical new stressor on natural systems that needs to be addressed using many of the same tools and approaches. A climate-inclusive strategic conservation plan will identify climate change as an active threat to natural resources in Step 1, and use data to identify a suite of resilient cores and corridors that can provide effective refuge to plants and animals.
Typically after applying a climate lens to their land protection priorities, land trusts have found that one or more of the following occurs:

- existing priority areas are determined to be climate resilient;
- places not identified as existing priorities are determined to be climate resilient and may be important new targets for land protection;
- existing priority sites are vulnerable (less resilient) to climate change effects and may require additional monitoring, management or restoration, or could be abandoned as priorities.

In some cases, a land trust may find it has invested significant resources in places with few resilient characteristics. While such places may be important for other reasons, such as enhancing recreation or conserving viewsheds, their long-term ecological health may be in question. Therefore it may be necessary to consider acquisitions that will connect these parcels of land to more resilient sites, or management interventions that increase their resilience (additional resources to inform climate change management decisions are available in Appendix A).

**ABOUT THIS GUIDE**

Whether used by individual staff or in group workshops, this guide can help conservationists evaluate the climate resilience of existing land protection targets; understand how a specific area contributes to the network of resilient landscapes across the Northeast; and develop or update a conservation plan that identifies regional priorities for land protection.

In three parts, the guide demonstrates how land protection can strategically increase the chances that natural systems will adapt to climate change.

**Part 1** Identifying Characteristics of a Resilient Network, introduces four characteristics underlying climate resilience and why they are relevant for determining which places will sustain biodiversity in the face of climate change.

**Part 2** A Step-by-Step Guide to Using Mapping Tools, introduces easy-to-use online mapping tools and spatial datasets that incorporate the concepts learned in Part 1. Through screen shots and hands-on exercises, it walks readers through the steps of assessing a property’s climate resilience in a regional context.
Part 3 Case Study, provides a detailed look at how a consortium of land conservation groups in North Central Massachusetts, used the four characteristics of climate resilience (Part 1), and deployed mapping tools and datasets (Part 2), to develop a climate-inclusive land acquisition plan.

A common theme throughout the guide is the importance of outreach and communication to the success of conserving resilient landscapes. Effective communication—with landowners, land trust boards of directors, scientists and the general public—about climate change will be vital to success. The desire to address the effects of climate change may vary widely from place to place, so finding ways to adapt communication strategies to each region will be important for success as well.

For reference, the Appendix lists helpful resources on best practices for outreach and communication; conservation planning; web-based tools; funding sources; and other information gleaned from organizations including OSI, LTA, the North Atlantic LCC and others.

Finally, there are a few important considerations as you use this guide:

1. While the guide does not directly address land protection for human communities, protecting land benefits both biological and human community resilience. Natural infrastructure is one of the most cost-efficient ways to protect against increased severity of storms. Wetlands and floodplains have proved to be the most effective way to temper flood damage.

2. The guide is designed for land trusts and other groups involved in protecting land within the 13 Northeast states and the Northern Appalachian ecoregion of Canada. However, many of the concepts described are relevant throughout North America, and many similar datasets are available for other regions.

3. This guide focuses on protection of terrestrial ecosystems and freshwater wetlands; information on how to apply these concepts to freshwater and coastal systems can be found at the end of section 1.

4. The concepts of resilience described in this guide cannot be achieved by any single organization. Resilience requires conservation organizations, from the federal government to state agencies to conservation scientists and local land trusts, working together to create a network of resilient protected lands across the Northeast. As you read, keep in mind that every organization has an important role to play but that no single organization can do it alone.
THE NORTH ATLANTIC LANDSCAPE CONSERVATION COOPERATIVE

Landscape Conservation Cooperatives (LCCs), a network of scientists and practitioners initially organized by the U.S. Department of the Interior, are experts in using the best available science to help public and private conservation groups work together to address climate and land-use change. The North Atlantic LCC was formed in 2009 as a partnership of federal agencies, states, tribes, universities, and private organizations working collaboratively to develop the science and tools needed to prioritize and guide conservation actions in the North Atlantic region, from southeastern Virginia to Atlantic Canada and southern Quebec.

The partnership’s services include coordination and organization, ecological planning, conservation design, conservation adoption and delivery, monitoring and evaluation, research, communication and outreach, and information management. Its online Conservation Planning Atlas, which includes maps and data related to climate change in the Northeast, is featured in Part 2. For more information, visit http://northatlanticlcc.org

OPEN SPACE INSTITUTE

The Open Space Institute protects scenic, natural, and historic landscapes to provide public enjoyment, conserve habitat and working lands, and sustain communities.

Founded in 1974 to protect significant landscapes in New York State, the Open Space Institute is a leader in environmental conservation. OSI has partnered in the protection of 2.2 million acres in North America, from Alabama to southeastern Canada. All of OSI’s work is directed by a consistent strategy emphasizing permanent protection on a landscape-level scale. OSI protects diverse landscapes including parks, preserves, working farms and forests, and utilizes climate science to identify critical landscapes for protection. OSI administers grant funds to preserve habitat for rare and endangered species, protect water resources, enhance recreational access, and support sustainably managed lands.

Generously supported by the Doris Duke Charitable Foundation, OSI launched the Resilient Landscapes Initiative in 2013 to help land trusts and public agencies across the eastern United States respond to climate change. The Initiative seeks to increase conservation of resilient landscapes and to focus land trusts on critical climate priorities. OSI achieves its goals through two capital grant funds in the Northeast and Southeast, and through a Catalyst Grant fund for outreach and education grants.