

North  
Atlantic  LCC



North Atlantic Landscape  
Conservation Cooperative

# 2014 ANNUAL REPORT





## INTRODUCTION

CREDIT: SHANNON MCGOWAN  
MOUNT GRACE LAND CONSERVATION TRUST

**No matter where you live in the Northeast, the impacts of land-use and climate change are inescapable – on the places we live and work, and on the natural resources that sustain us.**

Habitat fragmentation, invasive species, increasing coastal erosion, record flooding are very real effects of this change, and challenge our ability to sustain the wildlife, resources, and places that we are responsible for passing on to our grandchildren. These challenges require us to go beyond business as usual and respond decisively to adapt to rapidly changing conditions across the landscape and in our communities.

But what's also plain to see is an unwavering dedication to protecting these resources, and a growing recognition that we need to work together to do so.

Working independently, individual organizations can make important contributions by setting aside parcels of land and restoring habitat, but without understanding how our actions fit into a bigger conservation picture, we are limited in our long-term capacity to protect these resources.

The North Atlantic Landscape Conservation Cooperative helps us transcend these limitations. For conservation partners working at various scales throughout the region, the North Atlantic LCC provides a forum free of the constraints of boundaries and jurisdictions, and empowered by the place-based sense of stewardship that makes conservation possible on the ground.

The North Atlantic LCC is both a product of the collaborative momentum for landscape conservation that has been mounting in this region, and a means of sustaining it. Fortified by the knowledge and experience of 35 member organizations, our Steering Committee has charted a course for developing and delivering the best tools and information possible to address shared conservation goals.

In 2014, we reached an exciting stage in the evolution of this collaborative. Having built a strong foundation of partnerships and science, we have now begun to deliver information and tools to practitioners who can use them to inform on-the-ground conservation actions.

The Connecticut River Watershed landscape conservation design exemplifies this important milestone. A collaborative process and set of products, the design integrates data on species, ecosystems, environmental conditions, land-use and climate change to offer practitioners at any scale the best available information to make conservation decisions with broader context. Our next step is to transpose elements of this watershed-scale design to develop a conservation design for the entire Northeast region. But tools are only as powerful as they are applicable. Even when the design process is complete, the key to the success of these products is outreach, translation and adoption.

Likewise, with all of the information and tools we have developed to address the diverse conservation challenges facing our region, we recognize the critical next steps in realizing our goals: Delivering these tools through partner networks to people who need them, and providing training, information and support at appropriate scales.

The North Atlantic LCC Annual Report celebrates the tremendous achievements made by this collaborative in the last year - the more than 25 foundational science projects underway, the suite of related products beginning to roll out, the growing network of science delivery partners that are getting these tools into the hands of practitioners.

But above all, it celebrates you -- the people who make it possible. Through your commitment and vision, we have great hope for the future when it comes to conserving and sustaining the natural and cultural resources we care about.

*Ken Elowe, U.S. Fish and Wildlife Service Steering Committee Chair*

*Bill Hyatt, Connecticut Department of Environmental Protection Chief of Natural Resources*

# WHO WE ARE

## Our Partners

### STATES/DISTRICTS

- Connecticut Department of Environmental Protection
- Delaware Division of Fish and Wildlife
- District of Columbia Department of Environment
- Maine Department of Inland Fisheries and Wildlife
- Maryland Department of Natural Resources
- Massachusetts Division of Fisheries and Wildlife
- New Hampshire Fish and Game Department
- New Jersey Division of Fish and Wildlife
- New York Department of Environmental Conservation
- Pennsylvania Game Commission
- Rhode Island Department of Environmental Management
- Vermont Department of Fish and Wildlife
- Virginia Department of Game and Inland Fisheries

### NATIVE AMERICAN TRIBES

- United South and Eastern Tribes

### FEDERAL AGENCIES

- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- Department of the Interior Northeast Climate Science Center
- National Park Service
- Bureau of Ocean Energy Management, Regulation and Enforcement
- Bureau of Indian Affairs
- Bureau of Land Management
- National Oceanic and Atmospheric Administration
- U.S. Environmental Protection Agency
- U.S. Forest Service

### CANADIAN PARTNERS

- Environment Canada, Canadian Wildlife Service
- Association of Fish and Wildlife Agencies

### NON-GOVERNMENTAL ORGANIZATIONS

- Ducks Unlimited
- Manomet Center for Conservation Sciences
- National Wildlife Federation
- The Nature Conservancy
- National Fish and Wildlife Foundation
- New England Wildflower Society
- Trust for Public Land
- Wildlife Management Institute
- Wildlife Conservation Society

## WHERE WE WORK



## Our Staff

**Andrew Milliken**  
*North Atlantic LCC Coordinator*

**Scott Schwenk**  
*Science Coordinator*

**Steve Fuller**  
*Science Delivery Coordinator*

**BJ Richardson**  
*Regional GIS Coordinator*

**David Eisenhauer**  
*Science Applications  
Communications Coordinator*

**Renee Farnsworth**  
*Data Manager*

**Megan Tyrrell**  
*Coastal Resiliency Coordinator*

**Maritza Mallek**  
*Assistant to Science Coordinator*

**Bridget Macdonald**  
*Communications Coordinator*

**Stephanie Cuenoud**  
*Science Delivery Assistant*

## Our Region

- 12 states, 4 provinces, and the District of Columbia
- 129.4 million acres of land (52.2 million hectares)
- 38,000 miles of shoreline (61,000 kilometers)
- 57.9 million people, 17.8 percent of the U.S. population
- Terrestrial, aquatic, coastal and marine ecosystems
- Urban, agricultural, and protected lands



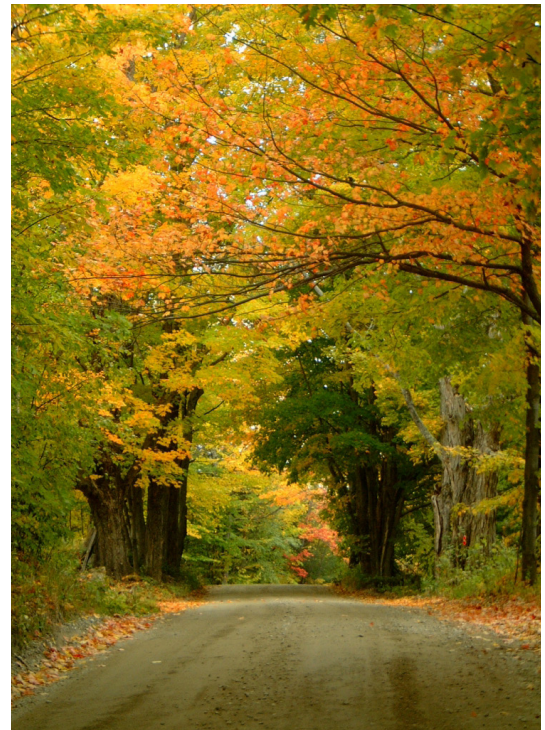
## WHAT WE DO

### Vision:

Landscapes that sustain our natural resources and cultural heritage maintained in a healthy state through active collaboration of conservation partners and partnerships in the North Atlantic region.

### Mission Statement:

The North Atlantic Landscape Conservation Cooperative provides a partnership in which the private, state, tribal and federal conservation community works together to address increasing land use pressures and widespread resource threats and uncertainties amplified by a rapidly changing climate. The partners and partnerships in the cooperative address these regional threats and uncertainties by agreeing on common goals for land, water, fish, wildlife, plant and cultural resources and jointly developing the scientific information and tools needed to prioritize and guide more effective conservation actions by partners toward those goals.



## HOW WE DO IT

### Our Strategy

Planning, design, delivery, monitoring, evaluation and research - each aspect of the conservation work supported by the LCC contributes to a regional vision for adaptive management.

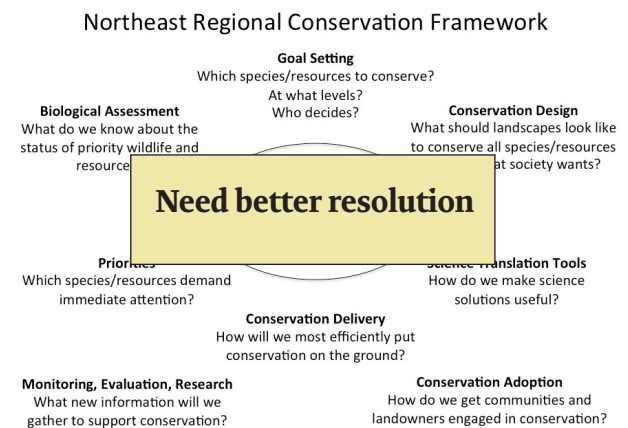
This vision is captured in the Northeast Regional Conservation Framework, which was developed in collaboration with state and other partners during a pivotal workshop in Albany, N.Y., in 2011. Although the Framework shares a number of elements with other adaptive management approaches, it is unique in its emphasis on delivery of science and practical applications:

- **Managing information** to ensure information is easily available in scales and formats needed
- **Translating science** into relevant and usable tools and products
- **Helping networks of partners** adopt and use these products for specific applications.

## OUR APPROACH

### What we did in 2014:

- Fostering collaboration: **Partnerships** (page 4)
- Supporting science and action: **Projects and Products** (page 6)
- Empowering stakeholders: **Science Delivery** (page 8)
- Addressing urgent needs: **Hurricane Sandy Resilience** (page 11)
- Planning for the future: **Landscape Conservation Design** (page 14)
- Sharing information: **Information Management and Communication** (page 17)





# PARTNERSHIPS

Conservation expresses the value society places on natural and cultural resources, and Landscape Conservation Cooperatives are by nature a social endeavor. Regional conservation would not be possible without diverse partners who believe in this vision, and are dedicated to making it a reality on the ground. The North Atlantic LCC brings these partners together around common goals for:



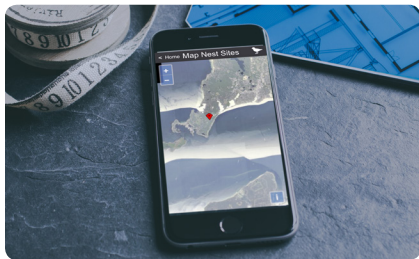
VERNAL POOL COOPERATIVE. CREDIT: KIM J. LAIDIG/NEW JERSEY PINELANDS COMMISSION



## CONSERVATION SCIENCE:

*Assessment, planning, design, monitoring and research to inform conservation decisions.*

**Example: iPlover Mobile Application**



A smartphone application supported by a partnership of federal agencies that facilitates collaboration among shorebird biologists all along the eastern seaboard, and provides a means of efficiently collecting and pooling information to understand the effects of sea level rise on habitat of the federally threatened piping plover.



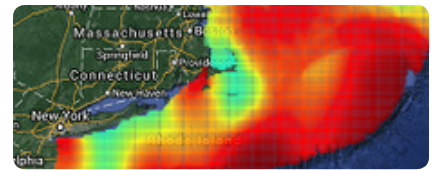
## LANDSCAPE CONSERVATION DESIGN:

*A process and products for setting goals and priorities at desirable levels and integrating information to meet those goals.*

**Example: Connecticut River Watershed Landscape Conservation Design**



A landmark landscape conservation design effort driven by more than 30 partners from different organizations that all share a commitment to the long-term conservation in the Connecticut River watershed.



## SCIENCE DELIVERY:

*Engaging stakeholders, translating science, demonstrating applications and applying tools on the ground.*

**Example: Science Delivery Grantees**

A cohort of four organizations (Wildlife Conservation Society, Open Space Institute, Chesapeake Conservancy, Highstead) who are partnering with the North Atlantic LCC to identify science needs at municipal and community levels, and help put science and tools into the hands of practitioners on the ground.





## CASE STUDY:

# Laying the Groundwork for Regional Partnerships

Ten years ago, the Northeast states were just on the eve of completing the first iterations of their State Wildlife Action Plans - comprehensive reports that identify priority species and habitats and strategies for conservation, and are required to qualify for federal wildlife grants.

With the deadline for the 10-year updates of the plans on the horizon, New Hampshire's Nongame and Endangered Wildlife Program Supervisor John Kanter reflected on how the process of creating the wildlife action plans resulted in more than just conservation strategy for individual states: It fostered unprecedented regional collaboration that helped lay the groundwork for the North Atlantic LCC.

Back in 2005, North Atlantic LCC Conservation Design Specialist Steve Fuller was Terrestrial Ecologist for the state of New Hampshire, where he worked with Kanter to create the state's first wildlife action plan.

"Fuller's vision was not only to guide the identification of where priority habitats were in New Hampshire, but to produce a map using our knowledge, a variety of publicly available information sources, and distribution data sets for the Species of Greatest Conservation Need," explained Kanter.

"We wanted to bring that same vision to the region using a similar process," he said. "But of course, it's more complicated at the scale of 13 states."

So where to begin? They started by convening representatives from the

regional wildlife associations.

"In 2006, we met in Albany, N.Y., and outlined priorities for what needed to get done in the region to do landscape-level planning and implement the wildlife actions associated with the most at risk Regional Species of Greatest Conservation Need," explained Kanter.

Along with priorities, the meeting in Albany gave rise to a means of funding them: the Regional Conservation Needs program, which draws four percent of each state's Wildlife Grant funding into a common pool to support regional projects.

"One of the highest ranking projects was a regional map. We got as far as we could with the RCN funding, and then the LCC came along and helped fill in the data gaps," Kanter said.

With the establishment of the North Atlantic Landscape Conservation Cooperative in 2010, there was now a mechanism in place to keep the momentum for regional collaboration going by generating funding, managing data, providing training, engaging the academic community, bringing in federal, tribal, NGO, and university partners and conducting landscape level analyses.



CREDIT: JOHN KANTER/NEW HAMPSHIRE FISH & GAME

"So we went from a shared vision to shared funding to support the various projects we had outlined at the first meeting in Albany," said Kanter. This shared vision was formalized at a second gathering in Albany, the Northeast Conservation Framework Workshop co-hosted by the states and the North Atlantic LCC in 2011. That resulting Northeast Regional Conservation Framework became the basis for the LCC's strategic plan.

Kanter explained that the real value of the LCC is not as a structural institution, but as both a forum and a resource for the many partnerships that have evolved organically to achieve shared conservation goals over the past decade.

For his part, Kanter is now helping to leverage this collaborative energy to facilitate the development of the first ever Regional Conservation Opportunity Areas for the Northeast.

"My role has been to be the number one cheerleader for regional collaboration," he explains, only half joking. "It would have been easy to say this is too complicated, and to just push back from the table. The most important thing we have done is to continue to get together."

# PROJECTS AND PRODUCTS

What new research can help move conservation forward? How do we translate this research into practical science solutions that can be applied on the ground?

The North Atlantic LCC supports a diversity of cross-cutting research projects that respond to the most urgent conservation challenges facing our region. While research provides a foundation, it is just the first step to addressing these challenges. From maps to tools to reports, The North Atlantic LCC supports a suite of products with direct conservation applications in multiple resource areas.

**The North Atlantic LCC is supporting research and development for more than 20 conservation products.**

*This table provides a snapshot of Product Highlights from 2014:*

PROJECT	PRODUCT	TARGET USERS	APPLICATIONS
<b>Completed</b>			
Piping Plovers and Sea-Level Rise	Models that link sea-level rise to beach response and habitat suitability for piping plovers	Shorebird biologists, federal and state resource managers	Protecting and managing beach habitat for piping plover and other beach-dependent species
Coastal and Marine Ecological Classification Standards (CMECS) for the Northeast	Report and spatial data demonstrating the application of the classification standards at multiple scales	Marine spatial planners, federal and state resource managers	Ocean planning and management
<b>In peer review</b>			
Climate Change Vulnerability Index for Northeast Species	Report on the vulnerability of select species of fish, wildlife and plants to climate change	Federal and state resource managers	Managing habitat for species of greatest conservation concern
Marine Bird Mapping and Risk Assessment	Map and report identifying key marine bird habitat and framework for assessing risk	Marine spatial planners, marine bird researchers	Risk assessment for offshore energy development
<b>Underway</b>			
A Landscape Conservation Design for the Connecticut River Watershed	Spatial plan identifying areas of land and water that offer the best potential to achieve shared conservation goals as part of an interconnected landscape	Federal and state resource managers, NGOs, land trusts, landowners	Strategic land acquisition and restoration
Decision support for Brook Trout in the Chesapeake Bay	Web-based tool for assessing brook trout habitat	Federal and state resource managers, NGOs, landowners	Site restoration and habitat protection
Lakes and Ponds Classification	Report and spatial data on the standard classification system for lakes and ponds	Federal and state resource managers	Consistent mapping of aquatic systems, habitat conservation
<b>New initiatives</b>			
Vernal Pool Mapping and Conservation	Secure database of vernal pool locations across the Northeast	Federal and state resource managers, NGOs, academic researchers, environmental consultants	Protecting vernal pools and associated species, Identifying data gaps for future surveying efforts
Restoring Aquatic Connectivity and Increasing Flood Resilience	Prioritization tool for evaluating aquatic barriers and terrestrial road crossings	Federal and state resource managers, transportation officials, municipalities	Infrastructure improvements, such as upgrading bridges, dams and culverts

For a full inventory of our projects visit: <http://northatlanticlcc.org/projects>





## CASE STUDY:

# The Best Darn Bird Map: A Risk Assessment for Offshore Energy Development

Extreme values and zeros: That's what might stand out to an ecologist looking at historic seabird data from the U.S. Geological Survey's Atlantic Seabird Compendium.

These values reflect the experience of surveyors looking for birds in a vast portion of the Atlantic Ocean. "There's a lot of difference in the sizes of the groups that are out there," explained Dr. Beth Gardner, Professor of Quantitative Wildlife Biology at North Carolina State University. Take common eider, for example. Although it's typical to see these birds in groups of a few hundred, flocks of more than 50,000 have been recorded as well.

But while extreme values are consistent with what is known about seabirds, they are also an indication of how much still remains unknown about these species. Although a tremendous amount of information has been collected on seabirds over the past century, it is difficult to interpret or draw conclusions from the data for a number of reasons: The challenge of obtaining accurate counts at sea, conflicting sampling priorities, inconsistent data collection methodologies, and the sheer expanse of the offshore waters, to name a few.

"The question is: Can we account for those kinds of values?" asked Gardner, explaining, "The main thing to know is the probability of extremes - what predicts them - but that's hard because it varies species by species."

For marine bird researchers and marine spatial planners, that has

made determining risks to species like roseate terns, northern gannets, and common eider a major challenge. With the growing emphasis on offshore energy development along the coastlines of New England and the Mid-Atlantic states, the challenge is becoming increasingly urgent.

Fortunately, for a quantitative ecologist like Gardner, those outliers in the seabird compendium contain valuable information, and a motivating question: "How can we model those extreme historic values to show hotspots for marine birds today?"

That was the objective of the Marine Bird Mapping and Risk Assessment Project - a partnership of federal, private and university partners, like Gardner, who set out to make the "best darn bird map" possible to advance understanding about how marine birds use offshore waters.

It was an effort of unprecedented magnitude. Although numerous projects have gathered information to help identify key habitat for marine birds, each has focused on a different region, and used different technology to gather data.

The final report, methods, and best-darn map from the Marine Bird Mapping project will soon be available on the North Atlantic LCC web page as a resource for practitioners, and a risk assessment tool for siting offshore

energy activities.

"So if someone is planning to build an offshore wind farm, the goal is for this map to serve as a guide," said Gardner. It does so by giving decision makers a means of answering a critical question about the proposed sites: What species of birds are likely to be present, and in what numbers? That information can serve as a starting point in understanding whether the proposed wind farm could have negative impacts on seabirds.

Although Gardner's role in the project involved the likes of comparing pareto and negative binomial distributions, and incorporating bathymetric spatial correlates and sea surface temperature into spatial models, she said she was mindful about producing a tool that would be understandable and useful for people of varying backgrounds.

"If you are statistician, the data might mean one thing, but what about for a manager?" she said. "We were very focused on applicability, readability, and clarity when using language that might be confusing."

In the context of marine spatial planning, the project offers something for everyone: The maps offer a clear visual reference, the report provides a framework for decision support, and the methods offer detailed information on model selection that could be useful for scientists.



Jorge Saliva, FWS



CREDIT: SHANNON MCGOWAN  
MOUNT GRACE LAND CONSERVATION TRUST

## SCIENCE DELIVERY

The most critical role that LCCs play in advancing conservation is not just developing information and tools; it is supporting a network of informed practitioners who can use these tools to reach common goals. Science Delivery focuses on expanding this network and making it stronger, by ensuring that practitioners have access to relevant resources, understand how to use them, and can help distribute information and knowledge to others.

The North Atlantic LCC’s Science Delivery effort focuses on three keys to meeting this goal:

1. **Information:** What information do practitioners need to make strategic decisions about conservation?
2. **Translation:** How can we make this information available and applicable to those who need it?
3. **Adoption:** Once equipped with the right information, how can we encourage communities and landowners to be involved stakeholders in conservation?

We respond to these needs by developing relevant Products, supporting Demonstration Projects and increasing the Capacity of a Delivery Network.

### Products

From maps to datasets to reports to Landscape Conservation Designs, the North Atlantic LCC provides a diversity of products with applications in multiple resource areas.

*Learn more about LCC projects and products on page 6.*

### Demonstration and Delivery Network Projects

The North Atlantic LCC provides Science Delivery grants to partners who have a vision for bringing information to practitioners, landowners and communities, and helping them deliver science at relevant scales to meet goals.

DEMONSTRATION PROJECT	GRANTEE
Envision the Susquehanna: Incorporation Landscape Science into Large Landscape Conservation	Chesapeake Bay Conservancy
Enhanced Stewardship of Priority Habitats and Species on Private Lands	Wildlife Conservation Society
Science to Practice: A Science Delivery Program for Regional Conservation Partnerships in New England	Highstead Foundation
Catalyzing Land Trust Capacity for Data and Science Integration	Open Space Institute





## CASE STUDY:

# Science to Practice: Highstead Foundation's support of Regional Conservation Partnerships

When Emily Bateson considers the conservation outlook for New England, she sees a number of unique challenges. In a region where 80 percent of the land is privately owned, and pressure from development is growing, "It's a race against time as habitat loss, fragmentation, and climate change all threaten the natural resources that sustain us," she said.

But Bateson doesn't see those challenges as obstacles. As the Conservation Director for Highstead Foundation, an organization dedicated to advancing conservation in New England, she sees them instead as opportunities. "I wonder: How do we reach those landowners? How can they play a part in conserving our ecological landscape at a larger scale? And how do we use the best conservation science to help them do so?"

Pointing out that New England invented the local land trust, Bateson called community-based conservation a profound strength of the region. As of the 2010 National Land Trust Census Report, there was a total of 500 land trusts operating in the six New England states. But she said local and regional land trusts used to work in isolation. They weren't focusing on or achieving goals vital to the overall ecological health of New England, including regional habitat connectivity and climate resilience.

"We all know we need to be thinking about ecological processes and conservation on a larger scale," Bateson said. "Fortunately, land trusts are increasingly combining forces to work with each other and with other partners across town and even state boundaries on long-term conservation goals. We call these conservation

collaboratives Regional Conservation Partnerships (RCPs)."

But as with any enterprise, increasing scale creates new needs. In the case of land conservation, scaling-up demands close coordination, effective networking, strategic planning, and consistent and regionally relevant data.

That's why Highstead established the Regional Conservation Partnership Network to help develop a community of practice around conservation and collaboration at the landscape scale, and to help provide RCPs with the tools needed to succeed. It's an extensive network. More than 40 RCPs work in New England today, covering more than 60 percent of the regional landscape.

"These conservation partnerships are growing rapidly and will be the key to conserving our natural landscapes and the myriad ecologic, economic, and cultural benefits they provide, if RCPs can access the tools and resources they need to succeed."

The key to their effectiveness is simple: Although Regional Conservation Partnerships are working to achieve large-scale conservation goals, they are also grounded in their local communities. As such, they are invaluable to addressing Bateson's first two questions about



EMILY BATESON  
CREDIT: HIGHSTEAD FOUNDATION

reaching and appealing to landowners. It's the third question where RCPs needed outside support. "Their capacity to harness cutting-edge conservation science for the purpose of prioritizing and catalyzing land conservation is mixed at best," explained Bateson.

Highstead has responded to this need through "Science to Practice," a Science Delivery project funded by the North Atlantic LCC. "Our proposal was to bridge the gap between the vast treasure trove of NALCC science and the network of RCP practitioners," said Bateson.

The grant enabled Highstead to offer four intensive workshops led by the NALCC and U.S. Fish and Wildlife Service staff. These workshops introduced participants to the datasets that are available in the Conservation Planning Atlas, and provided training on how to use them effectively.

The first two workshops were held in 2014. The first, in September, gave 24 members of 12 RCPs the opportunity to learn about datasets used in the Connecticut River Watershed Landscape Conservation Design Pilot. In November, the NALCC datasets were the subject of three workshops at the annual RCP Network Gathering. They were the most popular sessions, with 50 attendees each. “Those RCP coordinators will go back and report to their members, which include dozens of land trusts and community leaders,” Bateson said.



ROYALSTON, MASS.  
CREDIT: SHANNON MCGOWAN  
MOUNT GRACE LAND CONSERVATION TRUST



The final two workshops 2015 will include both hands on learning and focus group sessions with another Science Delivery grantee, the Open Space Institute (OSI), to gauge what kinds of guidance documents and interactive tools practitioners need to weave climate resilience science and planning into their work. “By the end of the program, we will have had four interactive, thorough all-day sessions focusing on this critical conservation science,” said Bateson. “And RCPs will know how to apply it in ways that will enable them to do their bit to conserve the ecological health of the entire ecoregion.”

For Bateson, application is ultimate measure of success. “We can put a lot of excellent data up on a website, but if practitioners don’t know it’s there, and don’t understand how to use it, we’re not going to get anywhere,” she said.

“That’s the vital role of the NALCC Science Delivery Program including the Highstead project.”





# HURRICANE SANDY

## Hurricane Sandy Resilience Projects

Hurricane Sandy left a path of destruction in its wake when it struck the eastern seaboard in October 2012, destroying hundreds of thousands of homes, causing billions of dollars worth of damages to infrastructure, and upending human communities and natural systems alike. In a large-scale recovery and restoration process made more urgent by the threat of more intense storms predicted with a changing climate, the North Atlantic LCC is helping to shore up vulnerable resources by connecting the dots between sea level rise, system response, habitat impact and species response.

Key questions to answer include:

- **How are species and habitats being impacted by storms and sea level rise?**
- **What restoration and management approaches can increase the persistence or resilience of coastal habitats and species?**
- **Where in the Northeast should we focus future efforts to protect and restore beaches, marshes, streams and other coastal habitats?**

With support from federal funding for Hurricane Sandy recovery, the North Atlantic LCC is coordinating a suite of projects examining beaches, tidal marshes, and aquatic connectivity with an eye toward resilience:

**BEACHES** - Decision Support for Hurricane Sandy Restoration and Future Conservation to Increase Resiliency of Beach Habitats and Beach-Dependent Species in the Face of Storms and Sea Level Rise

*Collaborators include:* Virginia Tech, Rutgers University, Conserve Wildlife New Jersey, U.S. Geological Survey, U.S. Fish and Wildlife Service, National Park Service, University of Massachusetts Amherst, Terwilliger Consulting, Northeast Regional Ocean Council (NROC), Mid-Atlantic Council on the Ocean (MARCO), and Conservation Biology Institute.

**TIDAL MARSHES** - Decision Support for Hurricane Sandy Restoration and Future Conservation to Increase Resiliency of Tidal Wetland Habitats and Species in the Face of Storms and Sea Level Rise.



HURRICANE SANDY: AERIAL SHOT OF MARTIN NATIONAL WILDLIFE REFUGE

*Collaborators include:* Saltmarsh Habitat Avian Research Partnership (SHARP) including the University of Connecticut, University of Maine, University of Delaware, State University of New York, Maine Inland Fisheries and Wildlife and other partners including University of South Carolina, University of Central Florida, University of Massachusetts, The Nature Conservancy, U.S. Fish and Wildlife Service, National Park Service, Northeast Regional Ocean Council (NROC), Mid-Atlantic Council on the Ocean (MARCO) and Conservation Biology Institute.

**AQUATIC CONNECTIVITY** - Collaboratively Increasing Resiliency and Improving Standards for Culverts and Road Stream Crossings to Future Floods While Restoring Aquatic Connectivity.

*Collaborators include:* University of Massachusetts Amherst, The Nature Conservancy, U.S. Fish and Wildlife Service, U.S. Forest Service, state Fish and Wildlife Agencies, Trout Unlimited, Wildlife Management Institute, Northeast Climate Science Center and Conservation Biology Institute.

## CASE STUDY:

# A Bird's Eye View of Coastal Resilience

Saltmarsh sparrow, seaside sparrow, willet, clapper rail, least bittern. Just a few of the dozens of bird species that depend upon tidal marsh habitat during the breeding season. They are also just a few of the 26 tidal-marsh bird species listed as Species of Greatest Conservation Need in states all along the eastern seaboard. With climate-driven sea level rise steadily encroaching upon their habitat, the need for conservation is only increasing.

In 2011, a collaboration of federal, state and university partners came together to address the growing threat to these species through the Saltmarsh Avian Habitat Research Program (SHARP) - an effort to assess risks and set response priorities from the coast of Virginia north to maritime Canada.

“We identified 1,700 point locations across the entire region, and went to every point in 2011 and 2012, estimating population size, distribution, and relationship to vegetation,” explained Dr. Chris Elphick, Professor of Ecology and Evolutionary Biology at the University of Connecticut and one of SHARP’s Principal Investigators.

So when Hurricane Sandy struck the eastern seaboard in October of 2012, the timing was fortuitous for the SHARP investigators. With the second field season already complete, they had a snapshot of tidal marsh systems in hand before the devastating storm hit the coast.

“We realized: We have this great baseline of information to really investigate the effects of big storms on these bird species,” said Elphick. Though they had used up their initial funding to carry out the two year data-collection effort, money from National Science Foundation came through to enable another survey in



FLOODED SALTMARSH SPARROW NEST. CREDIT: JEANNA MIELCAREK/UCONN SHARP

2013, and then Department of the Interior Hurricane Sandy Funding came through to support an additional two years in the field.

As with the many other projects funded through the DOI Hurricane Sandy awards, the devastating storm provided Elphick’s team a unique opportunity to investigate and respond to the ongoing degradation from development, ditching, and invasive species that will only be exacerbated by sea level rise, increased frequency of storms, and other impacts from global climate change.

The funding amounts to more than just additional field seasons. By supporting a suite of projects investigating the ecological implications of climate change for vulnerable coastal habitats from different angles and understanding how to best manage and restore these systems for resiliency, it creates an opportunity to align diverse research efforts toward common goals, and to unite diverse researchers under one roof. At least, for two days in December 2014, when more than 50 participants from universities, non-profit organizations, and state and federal agencies gathered at the U.S. Fish and Wildlife



Service Northeast Region Office for a Tidal Marsh Resilience Project Workshop organized by the North Atlantic LCC.

As a confluence of the different research projects driven by the same urgent threat, Elphick said the workshop was “phenomenally useful.” Although prior to the gathering, he had a good sense of the breadth of work being undertaken by scientists in the bird community, when it came to the other marsh projects, “Our knowledge was mostly superficial.”

That’s not for a lack of interest. “We don’t go to same meetings as the physical scientists,” he explained. “So it was great to hear in person about all of the other work that is being done, rather than reading about it in publications that are outside of our field.”

Beyond informational value, there were immediate practical benefits to the face-to-face interactions. For example, Elphick said, “There are a lot of different people collecting detailed elevation data, but before that meeting, I don’t think we even knew each other were.”

Now they are communicating, coordinating sampling efforts to avoid redundancy, and developing common protocols so the data can be easily combined and comparable across efforts.



YOUNG SALTMARSH SPARROWS. CREDIT: JEANNA MIELCAREK/UCONN SHARP

Other opportunities for synthesis came to light for projects that are asking similar questions, but answering them in different ways. Elphick pointed out that Dr. Kevin McGarigal of the University of Massachusetts Amherst is also interested in assessing tidal-marsh bird species, but that he uses an entirely different modeling approach.

“Now we are having conversations about making our data available to UMass, but not so we can do things in parallel, so we can do direct comparisons between approaches to see if they produce different results,” Elphick said.

With greater perspective on the scope of Hurricane Sandy tidal marsh projects, participants collaboratively worked on identifying next steps

for ensuring that individual projects contribute to overall goals. Key considerations moving forward included determining appropriate ways to measure resilience at different scales, linking projects at different scales, coordinating spatial data management, sharing data and decision tools, and communicating uncertainty in models at local levels.

“We have more connections than ever before,” said Elphick. “While it’s premature to say exactly where those connections will lead, before the workshop, there was no opportunity for them to lead anywhere at all.”

The partners will continue to share information and resources using a collaborative workspace on the North Atlantic LCC website and data portal.



# LANDSCAPE CONSERVATION DESIGN

The magnitude of the threat posed by climate change and land use change has demanded a new vision for conservation that looks further into the future and identifies opportunities for strategic action today.

Landscape conservation design is a key element of this vision, combining the foresight, cooperation and innovation needed to sustain natural and human communities in the face of change.

What does a landscape capable of supporting resilient human and natural communities now and in the future look like?

Conservation design is both a means of answering this question -- and the answer itself. As both a process and products, landscape conservation design helps address one of the foremost needs identified in the National Fish, Wildlife and Plants Climate Adaptation Strategy: to create ecologically connected networks of natural areas that are capable of supporting a broad range of species and ecologically processes even as conditions change.



AERIAL SHOT OF OF THE CONNECTICUT RIVER

## The Process

- **Finding common ground:**  
Through a partnership of organizations working at different scales in the region – NGOs, universities, private organizations, states, tribes and federal agencies – landscape conservation design identifies shared conservation goals that reflect social, ecological, economic and recreational needs.
- **Setting strategic objectives:**  
Using the best available science and regionally consistent data on species needs, habitats, ecosystem functions, climate change and land use change predictions, landscape conservation design offers the most efficient way to link conservation objectives and actions.

## The Products

- **Tools to inform meaningful actions:**  
By delivering maps and data at the appropriate formats and scales for stakeholders to visualize options and prioritize actions, a landscape conservation design is a set of tools for efficiently directing conservation on the ground. It helps partners to understand how much of what conservation actions are needed where to meet objectives.
- **Best practices for transferability:**  
With careful documentation of decisions, challenges, and lessons learned, landscape conservation design offers a framework to guide broader conservation goals and a process that can be applied throughout the Northeast region.



## CASE STUDY:

# A Landscape Conservation Design for the Connecticut River Watershed

What does it take to develop a long-term plan for supporting wildlife, ecosystems, and community interests in a 7.2 million acre watershed?

For the Connecticut River Watershed Landscape Conservation Design (LCD) project, it started with more than thirty people representing diverse organizations that share a stake in the future of an ecologically and culturally rich watershed at the heart of New England.

Add data for a suite of 14 representative species and more than 100 ecological systems, the best available predictions about land use and climate change, an innovative modeling framework, and a sense of urgency about the importance of the task, and you have a landmark undertaking for conservation and society.

“This was an opportunity to participate in something big and long term,” said Bill Labich, the Regional Conservationist for the Highstead Foundation, and a member of the project’s Core Team, emphasizing that the spatial and temporal scale of the project represented a shared vision for regional conservation.

After a year of monthly meetings and countless decisions surrounding focal species, systems, and scales, the partners in the Connecticut River LCD Project are on the eve of sharing the final product: A web-based set of maps that identify areas of land in the watershed that offer the greatest potential to sustain the diversity of life as part of an interconnected landscape.



EGRET WADING IN CONNECTICUT RIVER. CREDIT: CONNECTICUT RIVER WATERSHED COUNCIL

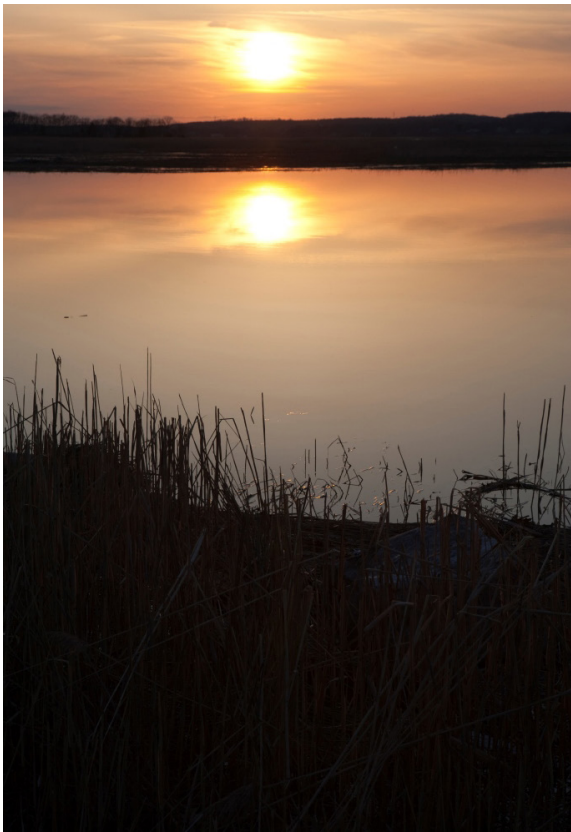
“Supporting ecologically connected networks of intact natural areas appears to be one of the most important things we can do in the face of climate change to ensure persistence and resilience,” explained Andrew Milliken, Coordinator for the North Atlantic LCC and a member of the Core Team. “It is the first strategy identified in the National Fish, Wildlife, and Plants Climate Adaptation Strategy.”

It’s also one of most significant projects made possible with support from LCCs, which Core Team member Marvin Moriarty from the Friends of the Silvio O. Conte National Fish and Wildlife Refuge calls a “phenomenal step in the right direction” for conservation.

“LCCs are collaboratives based on the recognition that all us – agencies, NGOs, whoever is involved in conservation in a big way - need to pull together and pool resources to be able to do a job that is bigger than any single one of us,” said Moriarty. “I hope the landscape conservation design becomes a go-to resource for all types of organizations to understand how to achieve what they are trying to on this landscape in a non-regulatory way.”

By combining extensive data sets on climate change, habitats, and species, and offering additional data overlays for rare species and natural communities, the design provides an unparalleled resource for organizations of all shapes and sizes. This information it provides allows for strategic focus





on individual objectives while simultaneously contributing to regional conservation goals.

With regular input from Core Team members, the models that underpin the design were developed by the North Atlantic LCC funded Designing Sustainable Landscapes Project, led by Professor Kevin McGarigal at the University of Massachusetts Amherst. The design also incorporated key products on resiliency from The Nature Conservancy and U.S. Geological Survey. The mapped network of linked core areas is considered the final product, but the design can be refined by the team at UMass as new data become available.

Although Labich pointed out that there are many important drivers for forest conservation in the Northeast, such as state Wildlife Action Plans and the USDA's Forest Legacy Program, he said, "The Landscape Conservation Design is something different: It identifies priorities across state lines that reflect both a consensus view and a national view. It shows us the kind of conserved larger landscape

we would need in order to sustain biodiversity over time. That's crucial for people who are working at the local and subregional scale."

One example of subregional planning and conservation is the network of 40 Regional Conservation Partnerships (RCPs) spread across the New England landscape. RCPs are informal collaborative networks of land trusts, community leaders, larger conservation groups, agencies, and others that work across boundaries, sectors, and over time to plan and conserve large landscapes. Learn more about the RCP network on page 9.

As a prioritization tool, the design will help practitioners at multiple scales make better decisions about their investments. By informing action, ranging from protecting land from development to managing and restoring habitat, the design will provide people with insight into both long-term impacts and opportunities for greater connectivity.

"A Regional Conservation Partnership can look at the design and say, 'Here is a habitat core or linkage in our area that is especially important for the ecological health of the whole watershed - how can we contribute?'" said Labich. "From there, RCPs can work to engage towns and other partners in their region to permanently conserve that habitat and manage it wisely for the future."

On the other end of the applicability spectrum, there may be immediate opportunities to incorporate the design into federal programs and partner initiatives. For one, it aligns with a new planning directive for using the landscape conservation design approach at National Wildlife Refuges. In biological contexts, the project articulates the first steps that could be taken to identify resource and habitat priorities on and near Refuge lands.

"The Landscape Conservation Design has the potential to unite people at all scales to conserve a more connected landscape for the benefit of both people and nature in the long term," said Labich.

"Conservation of core habitats and functional connectivity between them is more likely to happen when people are working on a shared strategic conservation plan that crosses state boundaries and watersheds."



# INFORMATION MANAGEMENT AND COMMUNICATION

How do we manage the demand for and creation of data to help conservation practitioners get the job done on the ground? How do we tell the story of the important work they are doing?

We provide resources, tools, and media to support our partners and spread the word about their efforts through the **North Atlantic LCC website** and **Conservation Planning Atlas**:

- Anticipating and responding to informational needs
- Maintaining and updating datasets
- Providing data access and technical support
- Sharing partner news and information

In 2014, our priority was to centralize regional datasets and make them accessible. We uploaded more than **100 new datasets** and associated reports to the North Atlantic LCC website and the Conservation Planning Atlas, making for a **total of 136 datasets**.

Our data are organized within **5 resources categories**:

1. Climate
2. Terrestrial
3. Aquatic
4. Coastal and Marine
5. Representative Species

RESOURCE CATEGORY	NUMBER OF DATASETS
Climate	65
Terrestrial	32
Aquatic	15
Coastal and Marine	11
Representative Species	13
<b>TOTAL</b>	<b>136</b>



INFORMATION MANAGEMENT AND COMMUNICATION:  
NORTH QUABBIN MAP  
CREDIT: BRIDGET MACDONALD/NALCC

We created **3 working groups** on our website to support North Atlantic LCC project teams:

1. Connecticut River Landscape Conservation Design
2. Regional Conservation Opportunity Areas
3. Hurricane Sandy resiliency project

We pulled in **7 galleries** from Two Countries, One Forest containing **46 datasets** from the Canadian portion of the North Atlantic LCC range

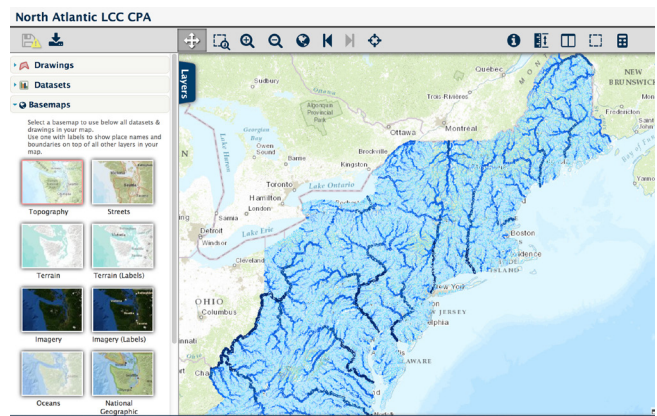
We delivered **4 technical training workshops** in which we:

1. Discussed the mission of the LCC, the regional context for work, project updates, overview of regionally consistent data
2. Provided hard drives containing all regional spatial data and associated reports available to date



3. Demonstrated how to access data from North Atlantic LCC website and Conservation Planning Atlas, and provided a tutorial and practice exercises for exploring Conservation Planning Atlas

- Introduced the Regional Species of Greatest Conservation Need habitat suitability modeling
- Introduced The Nature Conservancy’s geospatial condition analysis and demonstrated how to use weighting tool
- Discussed available and forthcoming data from the Designing Sustainable Landscapes project
- Invited questions and feedback on North Atlantic LCC website and Conservation Planning Atlas



We presented at [# TBD] conferences and workshops, produced and distributed a **quarterly newsletter**, posted partner and LCC **events and news** on our website, and hosted [# TBD] **webinars** directed at the conservation community.

## Visualizing Action through the Conservation Planning Atlas

When it comes to information management, data is just the beginning of the story.

Here is what our partners have to say about how North Atlantic LCC CPA is making it possible for them to implement conservation actions on the ground:

*“By connecting conservation planners working at different scales with the treasure trove of datasets available through the CPA, and training them on how to use them effectively, we can start to do effective conservation planning at the watershed level, the regional level, and across the entire LCC.”*

Emily Bateson,  
Highstead Foundation,  
Science Delivery grantee

*“It’s critical for the North Atlantic LCC to be providing this clearinghouse for regional climate data. It is so valuable to be able to say: You can go to one place to find the most up-to-date data,*

*and you can interact with it without having any GIS experience.”*

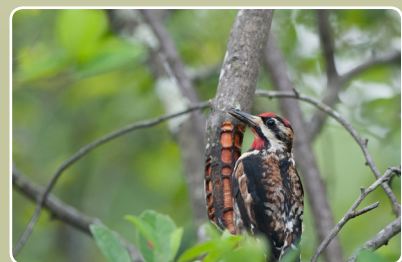
Abigail Weinberg,  
Open Space Institute,  
Science Delivery grantee

*“The North Atlantic LCC datasets are helping identify where conservation needs to happen. If the relevant datasets point to a community, that allows us to ask: How do we work with that community to target those particular conservation priorities on the ground?”*

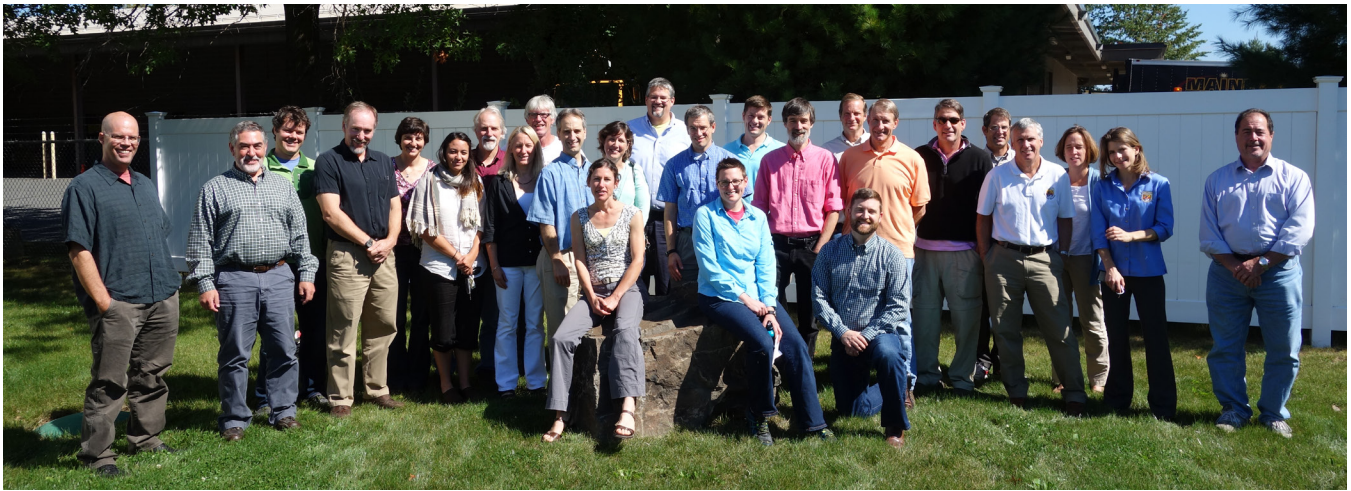
Heidi Krester, Wildlife  
Conservation Society  
Adirondack’s Program,  
Science Delivery grantee

*“There is so much more information available to us now, and what we are really trying to do in Delaware with the help of the LCC data is to improve how we make decisions so we are more effective in implementing conservation actions.”*

Kevin Kalasz, Delaware  
Fish and Wildlife,  
Steering Committee member



CREDIT: USFWS



INFORMATION MANAGEMENT AND COMMUNICATION: CORE TEAM  
CREDIT: BRIDGET MACDONALD/NALCC

## CASE STUDY:

# What we talk about when we talk about conservation: A communication plan for the Connecticut River Watershed Landscape Conservation Design

Target audiences, key messages, desired outcomes. The essential underpinnings of any communication effort require particular nuance when you're talking about a landscape level conservation project involving multiple partners, dozens of painstaking decisions, and a complicated modeling approach.

Incorporating the best available data on regionally important species and habitats, as well as predictions about how climate change will impact these resources over time, the Connecticut River Watershed Landscape Conservation Design represents the cutting edge in conservation science. But in order to be effective on the ground, it needs buy in from stakeholders and practitioners working at many different scales across the watershed.

That's why as the design phase of the project neared completion, a dozen Core Team members volunteered to start tackling some important questions: Who should know about the design? What's in it for them? What's the best way to reach them?



CONNECTICUT RIVER VALLEY . CREDIT: USFWS

Three members of the sub team shared insights on some of the key challenges they have been working through in the process of crafting an effective communications strategy, and offer lessons that transfer to any conservation outreach effort:

### **MAKING IT ACCESSIBLE:**

Making sound decisions about how we develop, conserve, and restore natural resources and the environment requires evaluating a great deal of information, "Information that is specialized, detailed, and





JOE-PYE WEED BESIDE THE BLACKWATER RIVER AT CANAAN VALLEY NATIONAL WILDLIFE REFUGE  
CREDIT: GERRI WILSON/USFWS VOLUNTEER

dense,” pointed out Andy Fisk of the Connecticut River Watershed Council. “This can be a barrier to those people who have the most at stake in ensuring we continue to improve not only our economy but our environment.”

So how do we remove those barriers? “We have to present tools like a landscape design in a manner that everyone can appreciate and understand,” he said. “Not everyone is going to use this tool, but they should know that it exists and how it can contribute to transparent, thoughtful, and robust decisionmaking.”

That means beyond just identifying audiences, thinking about different messages for each based on the ways they will interact with the design - whether it’s as a professional who can use it for direct application, or as a resident who can gain a better sense of the role of their property in providing critical habitat.

**PUTTING IT IN CONTEXT:**

Given the myriad planning resources that are available to conservation practitioners, “People will want to know: How is this different?” explained Kim Lutz of the Nature

Conservancy. She said it is important to communicate not only what the landscape design can be used for, but also how it can be used in concert with other tools.

“I like the word ‘complement’ because it suggests we can learn something new from this, but that you don’t have to abandon what you have been using already.”

With that in mind, Lutz added there is value in emphasizing the experimental nature of the project. “We should be thoughtful about the fact that this is a pilot. We want to reach potential users, and get their feedback, and then be able to incorporate lessons learned from initial testing.”



**REACHING ACROSS BOUNDARIES:**

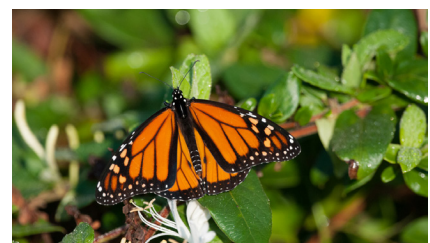
For Core Team member Marvin Moriarty of the Friends of the Silvio O. Conte National Fish and Wildlife Refuge, the key to communicating strategically about the landmark conservation effort is to think about it in much broader terms than conservation.

As the former regional director of the U.S. Fish and Wildlife Service Northeast Region, Moriarty understands the challenge.



“Conservation was my world, but beyond that, you have an economic sector that’s worried about development, housing people, transporting people, and providing energy to people. Then another sector focused on societal needs. How do we live together? How do we work together?”

Long-term conservation cannot be achieved without the inclusion of these other perspectives. “It’s people who are informed and educated in all of the other sectors who are making bigger and probably more impactful decisions.” The communication team’s challenge is to recognize the needs of other sectors, and figure out how to reach people on their terms.





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CAPE COD NATIONAL SEASHORE NEAR WELLFLEET, MA.

CREDIT: RALPH TINER/USFWS

For more information, please visit the North Atlantic LCC website: [www.northatlanticlcc.org](http://www.northatlanticlcc.org)  
For information on the national network of LCCs, please visit: [www.doi.gov/lcc/index.cfm](http://www.doi.gov/lcc/index.cfm)

