

North
Atlantic



LCC



North Atlantic Landscape
Conservation Cooperative

2014 ANNUAL REPORT

INTRODUCTION

NORTH QUABBIN REGIONAL LANDSCAPE PARTNERSHIP.
(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, and 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 in this region 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 sustain 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 real 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 expand 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 the extent to which they are actually used to make decisions.

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 our partnership 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
Steering Committee Vice Chair*

WHO WE ARE

Our Partners

STATES/DISTRICTS

Connecticut Department of Energy and 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

Pennsylvania Fish and Boat 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

Houlton Band of Maliseets

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

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
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)
- 58 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:

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.

2014 Accomplishments:

- 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 10)
- 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. The North Atlantic LCC brings these partners together around common goals for:



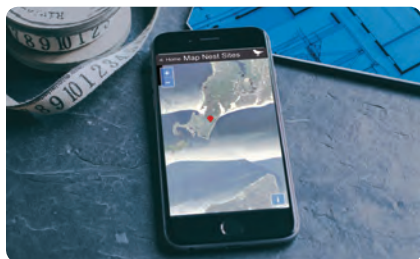
NORTH ATLANTIC VERNAL POOL COOPERATIVE. (KIM J. LAIDIG/NJ PINELANDS COMMISSION)



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.



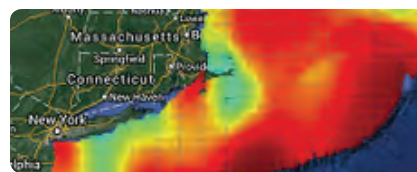
LANDSCAPE CONSERVATION DESIGN:

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.

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 Science Delivery Coordinator 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.




NEW HAMPSHIRE NONGAME AND ENDANGERED WILDLIFE PROGRAM MANAGER JOHN KANTER.
(JOHN KANTER/NH FISH AND 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 science into practical 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 science 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 conservation science products with direct applications in multiple resource areas.

The North Atlantic LCC is supporting research and development for more than 25 conservation products.

This table provides a snapshot of Product Highlights from 2014:

PROJECT	PRODUCT	TARGET USERS	APPLICATIONS
Completed			
Piping Plovers and Sea-Level Rise	Models that link sea-level rise to beach response and habitat suitability for piping plovers and other beach-dependent species	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, maps, 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
In peer review			
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
Underway			
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	Standard classification system, maps and spatial data for lakes and ponds	Federal and state resource managers	Assessment and prioritization of aquatic systems, habitat conservation
New initiatives			
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	Prioritizing aquatic connectivity and infrastructure improvements, such as upgrading bridges, dams and culverts

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



“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 maps 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.



ROSEATE TERNS.

(JORGE SALIVA/US FISH AND WILDLIFE SERVICE)

“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. 🌿

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 and making available 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.

We have hosted three webinars, six meetings, and presented or provided training at 30 conferences and workshops, including **4 technical training workshops**, in which we:

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

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.

PROJECT	GRANTEE
Envision the Susquehanna: Incorporation Landscape Science into Large Landscape Conservation	Chesapeake 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
Local Adaptation for Marsh Migration	Maine Department of Inland Fisheries and Wildlife
Climate Adaption in Appalachian Forests	National Wildlife Federation
White Mountains to Moosehead Lake	Trust for Public Land

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?"

While there are hundreds of land trusts across New England working toward community conservation goals, Bateson pointed out that until recently, most were operating 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," she said.

Over time, these entities began to realize they needed to be thinking about conservation on a larger scale. "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," Bateson said. "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," said Bateson.

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 reaching and appealing to landowners. It's the third question where RCPs needed outside support. "Their capacity to harness cutting-edge



HIGHSTEAD FOUNDATION CONSERVATION
DIRECTOR EMILY BATESON.
(HIGHSTEAD FOUNDATION)

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 North Atlantic LCC science and the network of RCP practitioners," said Bateson.

The grant enabled Highstead to offer four intensive workshops led by the North Atlantic LCC and U.S. Fish and

Wildlife Service staff, introducing participants to the datasets that are available in the Conservation Planning Atlas, and demonstrating how to use them effectively. The final two workshops in 2015 will also include focus groups 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.

For Bateson, application is the 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. 🌿

ADDRESSING URGENT NEEDS

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:



MARTIN NATIONAL WILDLIFE REFUGE. (US FISH AND WILDLIFE SERVICE)

BEACHES - Increasing Resiliency of Beach Habitats and Species

Coordinated effort through the North Atlantic LCC working with DOI Bureaus, Northeast Climate Science Center (CSC), coastal states, NGOs and university partners to integrate monitoring, models and tools to guide decisions about where and how to conduct beach restoration, conservation and management to sustain ecological values, ecosystem services and habitat suitability of beaches in the face of storm impacts and sea level rise in the Hurricane Sandy region.

Products

- Assessment of changes to tidal inlet and sandy beach habitats after Hurricane Sandy
- Beach-nesting bird location and habitat data collected on and adjacent to coastal refuges and parks
- Site-specific and regional models and decision support tools that relate sea level rise, storms and management to beach habitat suitability for piping plover and other beach dependent species

- North Atlantic LCC modeling framework integrating beach resiliency and habitat information
- Assessments of the impacts of beach nourishment and other stabilization activities on the resiliency of beaches, beach habitats and beach-dependent species
- Science delivery program to make coastal resiliency information and tools easily available decision makers at scales and formats needed

TIDAL MARSHES - Increasing Resiliency of Tidal Marsh Habitats and Species

Coordinated effort by North Atlantic LCC partners to integrate data, models and tools to guide decisions about where to conduct tidal marsh restoration, conservation and management to sustain ecological values, ecosystem services, habitat suitability and resiliency of tidal marshes and marsh species in the face of storm impacts, sea level rise and other stressors.

Products

- Regionally-consistent tidal marsh data and maps
- Integrated physical/biological marsh response models and decision support tools
- Assessment and mapping of regional marsh resiliency and integrity
- North Atlantic LCC modeling framework integrating tidal marsh resiliency and habitat information
- Monitoring and assessments of the effectiveness of DOI and partner tidal wetland restoration approaches
- Science delivery program to make marsh resiliency information and tools easily available



AQUATIC CONNECTIVITY - Increasing Aquatic Resiliency and Connectivity

Partner-driven, science-based approach through the North Atlantic LCC for identifying and prioritizing road stream crossings in the Hurricane Sandy area for increasing resiliency to future floods while improving aquatic connectivity. The resulting information and tools will be used to inform and improve decision making by towns, states and other key decision makers.

Products

- Formation of North Atlantic Aquatic Connectivity Collaborative
- Consistent road-stream crossing assessment protocols and comprehensive database for the Northeast Region
- Road stream crossing survey/assessment results using consistent Northeast protocols and database for prioritized watersheds
- Hydraulic response and risk assessment to climate change of road-stream crossings under current and predicted future stream flows
- Recommendations for crossing/culvert replacement standards and robust designs to withstand future flood events
- Web User Interface where users can rank and select crossings
- Training including webinar training for users targeting policy-makers on the local and state level

Collaborators include: Conservation Biology Institute, Conserve Wildlife New Jersey, Mid-Atlantic Council on the Ocean (MARCO), National Park Service, Northeast Climate Science Center, Northeast Regional Ocean Council (NROC), Northeast state Fish and Wildlife Agencies, Rutgers University, Saltmarsh Habitat Avian Research Partnership (SHARP), Terwilliger Consulting, The Nature Conservancy, Trout Unlimited, U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Geological Survey, University of Massachusetts Amherst, Virginia Tech, Wildlife Management Institute.

PIPING PLOVER.
(US FISH AND WILDLIFE SERVICE)

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 Habitat Avian 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 2013, and then Department of the



FLOODED SALTMARSH SPARROW NEST. (JEANNA MIELCAREK/UCONN SHARP)

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 DOI Hurricane Sandy funding managed by the North Atlantic LCC

does more than just support additional field seasons of research and monitoring. 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 support future conservation decisions.

It also provides the opportunity to unite diverse researchers under one roof. At least, for two days in December 2014, when more than 50 participants from universities,



HURRICANE SANDY TIDAL MARSH RESILIENCE PROJECT WORKSHOP. (BRIDGET MACDONALD/NORTH ATLANTIC LCC)

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 who 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.

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.”

These efforts coordinated by the LCC and supported by DOI and will result in better decisions in the future about where and how to focus restoration, protection and management efforts to help tidal marsh species persist in the face of future storms and sea level rise. 🌿

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 THE CONNECTICUT RIVER.
(CONNECTICUT RIVER WATERSHED COUNCIL)

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, habitats, ecosystem functions, climate change and land use change predictions, landscape conservation design allows partners to develop conservation objectives for priority resources and link them to actions needed

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 maps and 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.

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 30 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 IN THE CONNECTICUT RIVER. (CONNECTICUT RIVER WATERSHED COUNCIL)

“Supporting ecologically connected networks of intact natural areas is 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’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 of 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, former Northeast Regional Director for the U.S. Fish and Wildlife Service.”

“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.



SUNSET ON THE CONNECTICUT RIVER.
(CONNECTICUT RIVER WATERSHED COUNCIL)

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 8.

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 does the North Atlantic LCC 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**:

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



NORTH QUABBIN REGIONAL LANDSCAPE PARTNERSHIP
COORDINATOR SARAH WELLS.
(BRIDGET MACDONALD/NORTH ATLANTIC LCC)

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 published a quarterly newsletter, placed stories highlighting LCC work in a variety of media outlets, and developed communications resources with and for partners, including fact sheets, strategies, and an online communications toolkit for staff, Steering Committee members and partners to communicate about LCC goals and activities.

North Atlantic LCC website: <http://northatlanticlcc.org>

Conservation Planning Atlas: <http://nalcc.databasin.org>

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 when you can say: You have 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 determine how we can work with that community to target those particular conservation priorities on the ground.”

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



MARbled SALAMANDER
(STEVE FACCI/VERMONT CENTER
FOR ECOSTUDIES)



YELLOW-BELLIED SAPSUCKER.
PHOTOGRAPHED AT THE
QUABBIN RESERVOIR. (USFWS)

“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

Conservation Planning Atlas: <http://nalcc.databasin.org>



CONNECTICUT RIVER WATERSHED LANDSCAPE CONSERVATION DESIGN CORE TEAM.
(BRIDGET MACDONALD/NORTH ATLANTIC LCC)

CONSERVATION IN ACTION:

What we talk about when we talk about conservation: The Connecticut River Watershed Landscape Conservation Design

Target audiences, key messages, desired outcomes. The essential underpinnings of any communication planning 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.



CONNECTICUT RIVER VALLEY. (US FISH AND WILDLIFE SERVICE)

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?

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 dense,"



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

pointed out Andy Fisk, Executive Director 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, Connecticut River Program Director for 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, Moriarty said. “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.

PHOTO: RALPH TINER/USFWS

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

