



LANDSCAPE CONSERVATION
COOPERATIVES

North Atlantic Landscape Conservation Cooperative

2013 Highlights



About the North Atlantic LCC

The North Atlantic Landscape Conservation Cooperative (LCC) covers 12 states and the District of Columbia and 4 provinces in the Northeastern U.S. and southeastern Canada. The LCC encompasses more than 129 million acres and 38,000 miles of shoreline with a diversity of terrestrial, aquatic, coastal and marine systems and a full spectrum of land use from urban to agricultural to wilderness. There is also a diversity of jurisdictions, partners and partnerships in the North Atlantic LCC area with a history of working together towards common goals.

Our 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 LCC 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.

What We Do:

Coordination and Organization: Provide structure, staff and process that brings together and coordinates partners, develops consensus on common goals (resource outcomes), builds on and integrates existing partnerships and capacity, leverages and generates funding and other resources, prioritizes and develops scientific information and tools to make conservation more effective and evaluates progress towards resource outcomes by partners and partnerships within the LCC area and as part of the LCC national network.

Ecological Planning: Compile, organize and provide information from existing partners and partnerships on status, trends, current and emerging threats and limiting factors for priority fish, wildlife and plant species and cultural resources; agree on regional objectives for these species and resources; and assess their relationship to limiting factors, habitats and landscapes to provide a scientific basis for conservation actions.

Conservation Design: Develop and provide tools and information to guide decision makers and inform conservation actions to more effectively address threats, limiting factors and uncertainties and efficiently achieve objectives and ensure functional systems under current and predicted future conditions and link site-scale actions to landscape and regional scale goals.

Photo captions from top; Mountain in the Catskills, NY, Red knot, Silvio O. Conte National Fish and Wildlife Refuge, Brook trout, Lighthouse and light keeper's house at Monomoy National Wildlife Refuge on Cape Cod in Massachusetts.

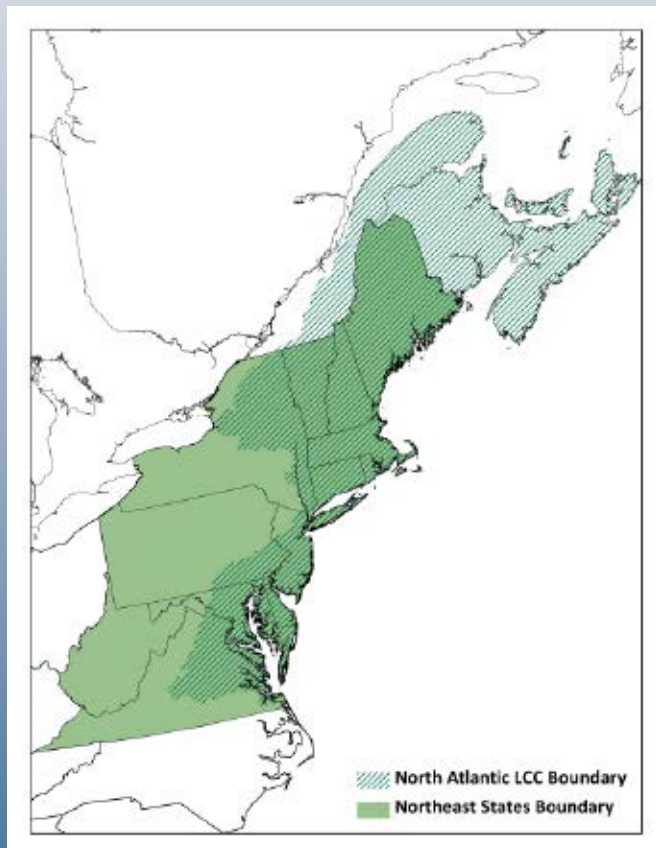
Conservation Adoption and Delivery: Assist partners with use of science and tools and work with partners to implement actions to test, validate and improve scientific information and tools developed by the LCC to enhance the ability of our lands and waters to sustain fish, wildlife, plant, cultural resources and unique ecosystems.

Monitoring and Evaluation: Facilitate monitoring of populations, resources, habitats and landscapes and tracking of conservation actions designed to assess the effectiveness of conservation actions, assess progress towards common goals and guide future planning and actions based on the results.

Research: Facilitate the pursuit and support of priority research activities based on needs identified and prioritized by partners and partnerships that test key assumptions in planning and inform future planning and delivery; provide guidance to Climate Science Centers on climate science needed by the LCC; and work with partners to coordinate ongoing research initiatives on priority conservation issues.

Communication and Outreach: Develop effective communication products to enhance communications among partners and partnerships, develop and sustain the LCC partnership, attract new partners, support existing funding and seek new funds, improve internal and external relations, and raise awareness of LCC priorities targeted to specific audiences.

Information Management: Compile, synthesize, organize and make available information, data, science and tools developed by partners and partnerships and the LCC in scales and formats needed by partners.



North Atlantic LCC Facts:

- 12 states and District of Columbia
- 4 provinces
- Area: 52.2 million hectares (129.4 million acres)
- Shoreline: 61,000 kilometers (38,000 miles)
- Population in the total LCC boundary: 57.5 million
- Percent of total U.S. population = 17.8%
- About two-thirds forested
- 12.5 degrees of latitude

Direction and support for the North Atlantic LCC are provided by its Steering Committee (<http://www.northatlanticlcc.org/groups/steering-committee>), Technical Committee (<http://www.northatlanticlcc.org/groups/technical-committee>) and LCC staff (<http://www.northatlanticlcc.org/about/staff>)

Achieving a Shared Landscape Vision

In the face of land use pressures and widespread resource challenges such as climate change and urban growth, the North Atlantic LCC took bold steps in 2013 to realize its vision of landscapes capable of sustaining natural and cultural resources and contributing to the well-being of people. In the following pages you will read about dozens of highlighted North Atlantic LCC activities and projects that demonstrate the growth and evolution of the partnership and its progress in developing and applying science to conservation planning, delivery and evaluation as part of a shared conservation framework in the Northeast region, as well as its role in providing critical conservation planning capacity to our members including:

- Building a network and greater capacity to translate existing science and information into tools that can help partners make conservation decisions and assisting partners in testing and adopting existing science and tools at various scales;
- Laying the groundwork for a fully functional system to compile, synthesize and manage information to meet growing demands for easy access to consistent data in the scales and formats needed throughout the region;
- Identifying and addressing foundational science needs for

- making better conservation decisions in the face of change and uncertainty; and
- Strengthening the bonds between agencies and organizations working together for conservation beyond individual borders and boundaries.

To focus our work and determine shared priorities in a landscape that is constantly changing, we continue to work with all the partners in the LCC to agree on common goals that reflect the missions of partner agencies and organizations. Highlights from 2013 include supporting the critical effort of providing regional information and context for State Wildlife Action Plan updates in the Northeast, as well as integrating and applying science to inform actions being taken to increase the resiliency of natural systems and communities in response to Hurricane Sandy and other damaging storms. The North Atlantic LCC is also increasingly engaged in providing science capacity and facilitation for comprehensive landscape conservation planning and designs to support multiple species and habitats within the region.

As a community of federal agencies, states, tribes, universities and private organizations, our ultimate goal is to achieve a larger landscape conservation vision that no single jurisdiction or organization could achieve on its own.



Steve Hillebrand/USFWS

Our Partners and Capacity

The North Atlantic LCC continues to build a broad partnership that is involved and engaged in accomplishing the shared mission of the LCC and strategically investing in staff capacity to support our work.

The LCC Steering Committee includes 34 formal members including: 14 agencies from Northeast states and the District of Columbia, tribal representatives (through United South and Eastern Tribes), nine federal agencies, Canadian partners (through the Canadian Wildlife Service), and eight non-governmental organizations. In 2013, the Steering Committee met in person in conjunction with the Northeast Fish and Wildlife Conference in April and the Northeast Association of Fish and Wildlife Agencies (NEAFWA) Directors meeting in November and by phone two additional times with high levels of participation and engagement.

The LCC Technical Committee has been expanded to include a broad partnership of more than 40 scientists representing a diversity of taxonomic, ecosystem and jurisdictional perspectives. Three sub-teams assessed the needs and projects related to terrestrial/wetland, aquatic and coastal/marine systems and provided science and technical recommendations to the Steering Committee. Technical committee members and other experts participated in developing RFPs, reviewing proposals and overseeing approved projects. Existing regional partnerships including the Atlantic Coast Joint Venture, Atlantic Coastal Fish Habitat Partnership, Eastern Brook Trout Joint Venture, Northeast Partners in Amphibian and Reptile Conservation, Piping Plover Recovery Team, Northeast Regional Ocean Council and Northeast Association of Fish and Wildlife Agencies helped to direct the 20-plus active projects. The LCC has instituted an independent and thorough peer review process for all funded projects that were completed, including the regional species and habitat vulnerability projects.

In 2013, the LCC built on the efforts of an ad-hoc Demonstration Projects team to develop a standing Science Delivery Team with 30 members that represents managers and decision makers in different agencies, organizations and partnerships and working at different scales from regional down to local. That team put together a strategy and science delivery Request For Proposals to guide grants and demonstration projects for translation, training, adoption and use of available information and tools.

The LCC continues to strategically build staff capacity to achieve its mission. In 2013, in addition to the existing Coordinator, Science Coordinator, Science Delivery Coordinator (part-time), GIS coordinator (part-time) and

Communications Specialist (part-time), the LCC added a full-time Geographer/GIS Analyst and part time data manager to help compile, analyze and synthesize spatial data and tools, much of which is now available on the LCC Conservation Planning Atlas. The LCC also co-funded a data manager with The Nature Conservancy's Eastern Resource Office to make the wealth of information created in that office –much of it for the Northeast States and LCC – fully available on the TNC site and the LCC site. The U.S. EPA continues to contribute a full-time liaison to the Northeast LCCs (North Atlantic and Appalachian) and the National Park Service continues to contribute a portion of their coastal landscape adaptation coordinator's time to support LCC activities.

Our Strategic Framework

The North Atlantic LCC organizes its work around adaptive resource management framework, agreed to by northeast partners -- the Northeast Conservation Framework -- and the LCC Conservation Science Strategic Plan that is based on that framework. The LCC also continues to assess priority needs from relevant large-scale planning efforts and partnerships (listed under our Partners and Capacity above). These partnerships are part of LCC technical teams and provide ongoing input on science needs and oversight for science projects. For example, the Atlantic Coast Joint Venture has assessed and prioritized over 50 science priorities and provided input to the LCC several times including 2013/2014. The LCC continues to work closely with the NEAFWA Regional Conservation Needs (RCN) program that pools State Wildlife Grant funding to address northeast regional conservation needs by annually evaluating the complementarity of RCN and LCC science needs.

Within that framework and LCC efforts continue to focus on:

- Foundational needs for organizing landscape conservation (consistent mapping, decision frameworks)
- Needs that address major threats and uncertainties to sustaining natural or cultural resources in the North Atlantic LCC (land use change, climate impacts, energy)
- Needs that address threats and uncertainties to multiple species, habitats, ecosystems or other features; and
- Needs that will inform conservation decisions and actions

With three years of funded projects ongoing or completed and a large number of other regional data and tools to draw from, the North Atlantic LCC is shifting more of its resources to the set of tasks associated with science delivery. This includes information management, translation of information to the scales and formats partners need, training and networks to deliver information, and projects to demonstrate the application of information and tools to making decisions (see next section for more detail).

Leveraging Partnerships

Coordination and Support for Hurricane Sandy Resiliency Science Projects

The North Atlantic LCC is working with the Department of the Interior (DOI), its bureaus, and the broader conservation community to coordinate Hurricane Sandy resiliency science projects, identify science needs and help guide future restoration investments. This includes a portion of Interior's recently announced \$162 million investment in 45 projects throughout the region impacted by Sandy, as well as science projects funded previously by DOI.

LCC partners also are working collaboratively on proposals for the competitive grant process managed by the National Fish and Wildlife Foundation. The Hurricane Sandy Coastal Resiliency Competitive Grants Program will award more than \$100 million in grants throughout the region affected by Hurricane Sandy, including Connecticut, Delaware, the District of Columbia, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Virginia, and West Virginia—the states that officially declared a natural disaster as a result of the storm event. The Foundation is looking to the LCC for guidance on priority science needs and priority areas for future investments in restoration.

As part of the Hurricane Sandy resiliency effort, the North Atlantic LCC is coordinating projects to develop decision-support tools for understanding future impacts of sea-level rise and storms – along with other predicted effects of climate change and urban growth – on beach and tidal wetland areas throughout the coastal region impacted by Hurricane Sandy. The North Atlantic LCC is also coordinating a collaborative, region-wide Hurricane Sandy resiliency project to prioritize efforts to increase the resiliency of road stream crossings to future floods while restoring fish passage (see Meeting Science Needs section below for additional detail on these projects).

DOI bureau partners that have received funding for Hurricane Sandy science projects are all part of the North Atlantic LCC including the U.S. Fish and Wildlife Service, National Park Service, U.S. Geological Survey, and Bureau of Ocean Energy Management. These bureaus will use the LCC to help coordinate the development and delivery of this science, not only among the DOI bureaus but also with other partners in the LCC. This includes the Northeast state fish and wildlife agencies, National Oceanic and Atmospheric Administration, Environmental Protection Agency, The Nature Conservancy, Trust for Public Land, Ducks Unlimited, Manomet Center for Conservation Sciences and National Wildlife Federation.

Supporting State Wildlife Action Plan Updates

The North Atlantic LCC is providing broader context for state and local conservation decisions and actions supported through each Northeast state's State Wildlife Grants (SWG) program by synthesizing regional conservation information on species and habitats for their State Wildlife Action Plan (SWAP) updates. The LCC worked with state agency partners to identify and prioritize regional conservation needs and priorities for more than 500 regional Species of Greatest Conservation Need and over 150 habitat types. This regional information allows each state and their partners to work together across boundaries toward common regional conservation goals and to focus their conservation actions on the most important areas for sustaining species and habitats.

This collaborative effort illustrates the power of partnership in sharing and advancing scientific knowledge, as well as forming a blueprint for directing that knowledge into action. The total SWG funds apportioned to the 13 Northeast states and District of Columbia ranges from \$10 million the last two years to a high of \$16 million. The regional synthesis is part of the LCC's continuing efforts to translate and deliver existing conservation information into forms and at scales that can help partners target these investments and make sound conservation decisions in the face of change and uncertainty. Next steps include training for state Geographic Information Systems staff and collaborative identification of regional Conservation Opportunity Areas.

Strategy and Priorities for Science Delivery

A consistent message from Northeast partners has been the need for increased emphasis on the delivery of science information and tools to partners in the scales and formats that they need. A new North Atlantic LCC Science Delivery team, including more than 30 members representing different delivery functions in federal agencies, state agencies, national NGOs, regional NGOs, tribes and watershed groups is articulating priority needs for effectively delivering science. The group assessed science delivery scales, audiences, current and anticipated applications and decisions and agreed on three categories of needs, including program development and capacity; partner support grants and demonstration projects; and information support and access needs. Initial priorities are;

- the development of a fully functional information management system;
- increased capacity for translation of science into conservation tools, technical assistance, training, and targeted outreach;
- grants to encourage partners/partnerships to use, test, or develop applications of data/tools;
- and workshops with users to provide information and get feedback on the most effective way to integrate available information and to provide training on tools.

As part of its ongoing effort to ensure that science information and tools are available in the scales and formats needed by various partners in the Northeast, the North Atlantic LCC announced in January that it is seeking proposals for science delivery partner support and demonstration



North Atlantic LCC Steering Committee members John O'Leary and Sharri Venno discuss an issue during a break in the committee's November 2013 meeting.

projects. Science delivery partner support projects should promote the use and adoption of landscape conservation science investments by teaching and providing technical assistance to others. Demonstration projects should promote the use and adoption of landscape science investments by creating examples of on-the-ground applications of landscape conservation science.

Supporting Regional Partnerships

The LCC continues to closely collaborate with and support regional partnerships. Examples from 2013 include our collaborations with the Northeast Regional Oceans Council, Atlantic Coastal Fish Habitat Partnership and the Northeast Partners in Amphibian and Reptile Conservation.

The Northeast Regional Oceans Council (NROC) and its sister partnership the Mid Atlantic Council on the Oceans (MARCO) include leaders from the state coastal zone agencies in North Atlantic LCC coastal states along with federal agencies that are involved with ocean issues. By working together, LCC and NROC are able to leverage their different partners and resources for common goals. The LCC and NROC Steering Committees share members and LCC staff regularly communicate with NROC staff and leaders about shared coastal and ocean priorities. In 2013, the LCC provided webinars and briefings to NROC on three LCC projects for NROC: Mapping the Distribution, Abundance and Risk Assessment of Marine Birds in the Northwest Atlantic Ocean; Application of the Coastal and Marine Ecological Classification Standards (CMECS) to the Northeast; and Research and Decision Support Framework to Evaluate Sea-level Rise Impacts for the U.S. Atlantic Coast. NROC will assist the LCC in developing next steps for each of these projects and has adopted CMECS as the classification they will use for further mapping efforts.

In 2013, the North Atlantic LCC worked with the Atlantic Coastal Fish Habitat Partnership (ACFHP) to address their priority need to better understand habitats and threats for priority coastal and aquatic fish resources of the region by initiating a new decision support tool project. ACFHP was actively involved in selecting the project and is now providing oversight to that project and linking it to their partners.

The LCC also continued to collaborate with the Northeast Partners in Amphibian and Reptile Conservation through its support of the project to identify Priority Amphibian and Reptile Conservation Areas and by starting a new project (see next section) on mapping vernal pools, which are small wetlands critical for amphibians and other wildlife. This regional partnership provides input and oversight for these two projects.

Meeting Science Needs

Providing the Foundation

One of the chief impediments to large-scale, collaborative planning and action for conservation envisioned by the LCC partnership is the dearth of high quality, regionally consistent information about fish and wildlife species, habitats, and landscapes. Such information serves as the “foundation” upon which partners can build planning tools and set strategic priorities for effective conservation action. Consequently, since its inception the North Atlantic LCC has placed a high priority on creating, organizing, and making available foundational data and information.

In 2013, the North Atlantic LCC achieved considerable progress in its work to assemble and make available foundational information. Working with Northeast states, The Nature Conservancy, and other partners, the LCC assembled dozens of regional datasets about the physical environment (soils, geology, streams, climate), fish and wildlife, natural communities, and human land use and activities (roads, development, protected areas). Where useful, the LCC added further value to this information by deriving new regional data products from the datasets. The LCC is providing these data to many users, including state agencies, and making many available through the Conservation Planning Atlas (described below under “Information, Data and Tools”).

The North Atlantic LCC also supported the development of new foundational information in 2013. For example, with LCC support the Conservation Management Institute at Virginia Tech completed a rapid update of wetlands mapping in 162 coastal areas that will be incorporated into the National Wetlands Inventory. LCC partners had identified the revision of out-of-date wetlands maps as being a high priority for coastal planning and for understanding regional habitat conditions for coastal wildlife. Another example in the coastal realm was the completion of the first phase of an LCC project classifying estuarine and marine environments from Maine to Virginia using the Coastal and Marine Ecological Classification Standards (CMECS), a project led by The Nature Conservancy, the Massachusetts Department of Fish and Game, and the University of Rhode Island.

Protecting People and Communities, Helping Fish and Wildlife

The U.S. Fish and Wildlife Service has received \$1.27 million in Hurricane Sandy mitigation funds from the Department of the Interior to work through the North Atlantic LCC to coordinate and support a collaborative, region-wide effort to restore fish passage while reducing the likelihood of damage to road stream crossings from future floods.



USFWS

The critical role of culverts — essentially big pipes or concrete boxes carrying streams beneath roads — was demonstrated dramatically in a series of extreme weather events hitting the Northeast in recent years. In 2011, intense and sustained rain from Hurricane Irene and Tropical Storm Lee washed out roads throughout mountains of New York and New England as culverts running under those roads were not designed to handle such enormous volumes of water. Additional flooding from Hurricane Sandy, which lashed the Northeast coast and adjacent inland areas in October 2012, caused additional damage. The widespread effects of these massive storms underscore the need for a regional science-based approach to prioritize and increase the resiliency of roads to floods.

Improving the resiliency of roads has multiple benefits beyond protecting human health, safety, and property. Upgrading, repairing or replacing culverts can also increase connectivity and movement of fish and wildlife. This addresses a critical problem because aquatic systems in the Northeast are extremely fragmented by undersized or damaged road culverts that are unfit to provide passage for fish, other aquatic organisms and wildlife. Beyond their in-stream benefits, fish-friendly culverts also help sustain nearby wetlands and floodplains while they nourish coastal beaches with sediment.

This project involves a number of tasks that will assist local, state, and federal partners in protecting roads and improving fish passage. These include:

- Develop a database and mapped locations and condition assessments of road stream crossings based on existing data and models;
- Support additional surveys of road stream crossings;
- Predict future storm discharge levels;
- Assess risk; and
- Prioritize crossing improvements.

The resulting regionally-consistent data on stream crossing locations and future flood conditions will help towns,

North Atlantic LCC: 2010-2014 Projects at-a-Glance

For full details on these projects, visit
<http://www.northatlanticlcc.org/projects>

Application of the Coastal and Marine Ecological Classification Standards (CMECS) to the Northeast

End Date: December 31, 2013
Project Leader: Mark Anderson
Organization: The Nature Conservancy

Climate Change Vulnerability Index for Northeast Species

End Date: June 30, 2013
Project Leader: Lesley Sneddon
Organization: NatureServe

Coastal Update to the National Wetlands Inventory

End Date: September 30, 2013
Project Leader: Scott Klopfer
Lead Organization: Conservation Management Institute at Virginia Tech

Decision Support to Increase Resiliency of Beach Habitats and Species

End Date: November 2016
Project Managers: Andrew Milliken and Anne Hecht (multiple project leaders)
Lead Organization: North Atlantic LCC

Decision Support to Increase Resiliency of Tidal Wetland Habitats and Species

End Date: November 2016
Project Leader: Andrew Milliken
Lead Organization: North Atlantic LCC

Demonstration Project: Marsh Migration

End Date: December 31, 2013
Project Leader: Bob Stratton
Lead Organization: Maine Dept. of Inland Fisheries and Wildlife

Demonstration Project: Climate Adaptation in Appalachian Forests

End Date: September 30, 2014
Project Leader: John Kostyack
Lead Organization: National Wildlife Federation

Demonstration Project: White Mountains to Moosehead Lake Initiative

End Date: December 31, 2013
Project Leader: Jad Daley
Lead Organization: Trust for Public Land

Designing Sustainable Landscapes, Phase I & 2

End Date: June 1, 2012 and June 30, 2014
Project Leader: Kevin McGarigal
Lead Organization: University of Massachusetts-Amherst

Extending the Northeast Terrestrial Habitat Map to Atlantic Canada

End Date: February 28, 2015
Project Leader: Mark Anderson
Lead Organization: The Nature Conservancy

Forecasting Changes in Aquatic Systems and Resilience of Brook Trout

End Date: December 31, 2013
Project Leader: Ben Letcher
Lead Organization: U.S. Geological Survey

Identifying Important Migratory Landbird Stopover Sites in the Northeast

End Date: June 15, 2015
Project Leader: Jeffrey Buler
Lead Organization: University of Delaware

Marine Bird Mapping and Assessment

End Date: June 30, 2014
Project Leader: Beth Gardner
Lead Organization: North Carolina State University

Permeable Landscapes for Wildlife in the Northeast

End Date: January 31, 2015
Project Leader: Mark Anderson
Lead Organization: The Nature Conservancy

Piping Plovers and Sea-level Rise

End Date: August 30, 2014
Project Leader: Sarah Karpanty
Lead Organization: Virginia Tech

Priority Amphibian and Reptile Conservation Areas (PARCAs)

End Date: December 31, 2014
Project Leader: Priya Nanjappa
Lead Organization: Association of Fish and Wildlife Agencies

Refine Northeast Aquatic Habitat Classification

End Date: June 30, 2014
Project Leader: Mark Anderson
Lead Organization: The Nature Conservancy

Restoring Aquatic Connectivity and Increasing Flood Resilience

End Date: November 2016
Project Leaders: Scott Jackson and others
Project Manager: Phil Herzig, U.S. Fish and Wildlife Service
Lead Organization: University of Massachusetts-Amherst

Terrestrial Wildlife Habitat Models

End Date: September 30, 2011
Project Leader: Therese Donovan
Lead Organization: University of Vermont

Vernal Pool Mapping and Conservation

End Date: December 1, 2014
Project Leader: Steven Faccio
Lead Organization: Vermont Center for Ecostudies

Virginia Piedmont and Coastal Plain updates to Northeast habitat map

End Date: June 23, 2012
Project Leader: Mark Anderson
Lead Organization: The Nature Conservancy

Vulnerabilities to Climate Change of Northeast Fish and Wildlife Habitats, Phase II

End Date: October 31, 2012
Project Leader: Hector Galbraith
Lead Organization: Manomet Center for Conservation Sciences

states and communities prioritize restoration, manage future intense storms and improve conditions for aquatic organisms. The project will be facilitated by the North Atlantic LCC and the Fisheries Program of the U.S. Fish and Wildlife Service and guided by partners and users from the conservation, transportation, and state and municipal planning sectors.

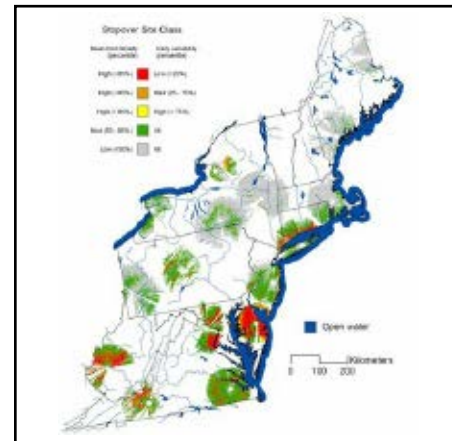
The project will take place over three years in coastal watersheds in New Jersey, Delaware, Connecticut, Rhode Island, Massachusetts, Maryland and Virginia. Partners include USFWS, the Nature Conservancy, Trout Unlimited and the U.S. Forest Service. In addition to the DOI funding, the culvert project is supported by \$150,000 in matching funding from the North Atlantic LCC that will allow the inclusion of additional Northeast states in the project.

Coordinating Hurricane Sandy Beach and Marsh Resiliency and Restoration Science Projects

DOI Secretary Sally Jewell announced last October that the Department will invest \$162 million in 45 restoration and research projects that will better protect Atlantic Coast communities from future powerful storms, by restoring marshes, wetlands and beaches, rebuilding shorelines, and researching the impacts and modeling mitigation of storm surge impacts.

In addition to the culvert project described above, the North Atlantic LCC will help coordinate two other Hurricane Sandy projects (totaling nearly \$4 million) to develop decision-support tools for understanding future impacts of sea-level rise and storms – along with other predicted effects of climate change, urban growth and conservation – on beach and tidal wetland areas throughout the coastal region impacted by the storm. These projects will include evaluating the effectiveness of restoration, management and protection strategies for increasing the resiliency of beach and marsh

habitats and species; and ensuring that results and decision-support tools are made available for use by DOI, other federal agencies, states and local communities. The LCC will work with DOI Bureaus, the Northeast Climate Science Center, coastal states, tribes, NGOs and university partners.



NALCC

Identifying Important Migratory Landbird Stopover Sites

A bird's migration is crucial to its survival. Every year, millions of birds migrate through the Northeastern United States to their summer breeding grounds in the U.S. and Canada and their nonbreeding grounds as far south as South America. As they migrate, birds must find areas where they can safely stop, rest, and feed. Conservation efforts are increasingly focused on identifying stopover sites that are most important for sustaining migratory birds. In 2013, the North Atlantic LCC joined with the U.S. Fish and Wildlife Service and other partners to sponsor a new project by the University of Delaware and USGS to use weather surveillance data and field surveys to map and better predict the stopover areas most critical for landbirds.

Conserving Important Habitat for Amphibians and Other Wildlife

Vernal pools are small, temporary bodies of water that can serve as critical habitat for frogs, salamanders, and other wildlife. In 2013, the North Atlantic LCC initiated a new project to address a critical first step in conservation efforts for highly vulnerable, vernal pool dependent wildlife: better understanding where vernal pools are located across the region. Following a competitive grant process, the LCC selected a team from the Vermont Center for Ecostudies, the University of Vermont, and High Branch Conservation Services to lead the effort. The project will assemble known vernal pool locations across the Northeast; describe current approaches for mapping vernal pools; and develop a new approach for using remote sensing to vernal pools not previously mapped.



Greg Breese/USFWS



Lamar Gore/USFWS

Planning and Design

Learning By Doing in the Connecticut River Watershed

In the Connecticut River watershed and across the nation, large connected natural areas provide habitat for fish, wildlife and plants and provide jobs, food, clean water, storm protection, recreation and many other natural benefits that support people and communities. To ensure a sustainable future for these resources in the face of climate change, urban growth and other land-use changes and pressures, scientists and conservationists must work together to strategically conserve these large landscapes.

Facilitated by the U.S. Fish and Wildlife Service (FWS) and supported by the North Atlantic LCC, the Connecticut River Watershed Landscape Conservation Design Pilot is a collaborative effort to plan and design such a landscape. The pilot is led by a Core Team of conservation partners composed of federal and state agencies and private organizations working at various scales in the Connecticut River watershed. FWS will coordinate with partner agencies and organizations and request participation through the North Atlantic LCC, Friends of the Silvio O. Conte National Fish and Wildlife Refuge and other partnerships.

The pilot will use the best available science to help partners set goals and measurable objectives for representative species of fish and wildlife (and supporting ecosystems) and translate those into projections of the amount, type and distribution of habitat needed to sustain them at those levels. Landscape conservation designs informed by this planning effort are

intended to guide collective conservation actions within the watershed and connect to broader regional conservation goals for conserving sustainable fish and wildlife populations. The pilot also hopes to establish a landscape conservation design process that can be applied in geographies throughout the Northeast region and beyond.

Pilot objectives include:

- Agreeing on common conservation goals and objectives for the Connecticut River watershed that are informed by watershed and regional priorities (while recognizing social, economic and recreational contributions to future iterations of landscape conservation designs);
- Providing conservation design information that is available at scales (including local scales) and in formats needed by partners to guide conservation decisions and inform planning (e.g. National Wildlife Refuge Comprehensive Conservation Plans, National Forest Plans, State Wildlife Action Plans); and
- Using and refining regional and landscape-scale conservation design information and tools to prioritize and make better conservation decisions (including habitat protection, management and restoration) to most efficiently achieve these objectives, including biological outcomes for fish, wildlife and plant species.

Pilot deliverables will include information, maps and tools that show landscape conservation design options for prioritizing conservation actions needed in the Connecticut River watershed and a process paper describing lessons learned that can be applied to landscape conservation design in other landscapes across the Northeast.

Designing Sustainable Landscapes (Phase 2)

This ongoing LCC project is intended to assess the capability of current and potential future landscapes in the Northeast to provide integral ecosystems and suitable habitat for a suite of representative species, and provide guidance for strategic habitat conservation in the face of urban growth, changing climate, and other threats. Building on Phase 1, this project expands the geographic scope from three pilot watersheds to the entire 13-state Northeast region and develops the landscape conservation design component to provide support for conservation decisions.

The *Designing Sustainable Landscapes* project is a foundational part of a set of tools being developed by the North Atlantic LCC to guide conservation decisions in the face of regional change. The University of Massachusetts-Amherst, working with a broad coalition of LCC partners, is leading the project. *Designing Sustainable Landscapes* builds upon and incorporates existing information for the Northeast, such as consistent habitat classifications and maps, as well as climate data and wildlife population data. With these tools, conservation managers will be able to make more informed conservation decisions about where and how much land protection and habitat restoration and other conservation actions are needed to sustain wildlife populations in the face of predicted changes to the landscape.

The second phase of the project has the following goals:

- Assess the current capability of habitats in the North Atlantic LCC to support sustainable populations of wildlife;
- Predict the impacts of landscape-level changes (e.g., from urban growth, conservation programs, climate change, etc.) on the future capability of these habitats to support wildlife populations;
- Target conservation programs to effectively and efficiently achieve objectives in State Wildlife Action Plans and other conservation plans and evaluate progress under these plans; and
- Enhance coordination among partners during the planning, implementation and evaluation of habitat conservation through conservation design.

Assessing Aquatic Habitats and Threats

Working with the Atlantic Coastal Fish Habitat Partnership, in 2013 the North Atlantic LCC launched a new project to develop a decision support tool for assessing aquatic habitats and threats in watersheds and estuaries of the region. Selected following a competitive grant process in 2012, Downstream Strategies is leading the tool development effort. During the first year of the project, effort was focused organizing project partners, assembling regional data and beginning pilot habitat modeling for the first fish species selected, winter flounder. Ultimately, the tool will allow resource managers to visualize and manipulate information

on aquatic habitats and threats for multiple coastal and aquatic species to prioritize areas for conservation action as an aquatic complement to the *Designing Sustainable Landscapes* project.

Information, Data and Tools

Northeast Synthesis of Information and Tools

Following the Northeast Conservation Framework, northeast States, LCCs and other regional partners have developed or are developing consistent terrestrial, aquatic, coastal and marine habitat classifications and maps, regional species and habitat vulnerability assessments, specific assessments of regional species of concern, assessments of ecological functions, and modeling frameworks and tools that provide support to evaluate alternatives and make decisions about conservation actions in the face of change. These tools collectively help articulate a landscape conservation blueprint or design for the Northeast and provide regional context for state and local actions. The goal of this compilation and synthesis effort is to establish cooperative means to make this existing ecological planning and conservation design information more available to conservation partners for making decisions. Information and relevant products from completed and ongoing regional projects (including those generated through LCC and Regional Conservation Needs projects) are being synthesized and shared with partners and partnerships to facilitate their integration with on-the-ground delivery mechanisms. This project is supported in part through the hiring of Conservation Design Specialist and GIS Analysts in The U.S. Fish and Wildlife Service and The Nature Conservancy. As one key outcome, the North Atlantic LCC and state partners are developing a synthesis of regional conservation information focused on providing the species and habitat information needed for State Wildlife Action Plan (SWAP) revisions (see details under Leveraging Partnerships)

Conservation Planning Atlas

One way that this synthesized information is through a regional data portal and information management system. After an extensive information management needs assessment with Northeast partners, the North Atlantic LCC chose Data Basin as the information management system and visualization platform for its Conservation Planning Atlas, a platform for easy access to high-quality geospatial datasets, maps and information to facilitate partner-driven conservation. Data will reside in USGS's ScienceBase, a searchable data management and web mapping services platform, and the services will be imported to Data Basin to put into live web maps. This combination of systems will be used by at least 17 of the 22 LCCs nationwide, and will enable consistency across the LCCs for stakeholders and the public to find and use the many data products that have and will continue to come out of the LCCs. Data will also be made available for download through this system, with downloads coming from data owners (e.g. The Nature Conservancy) as much as possible.

Vulnerability Assessments

Assessing Regional Species and Habitat Vulnerability

Numerous studies show that ongoing climate change will have major effects on the distribution and conservation status of much of our biodiversity. Resource managers urgently need a means to identify which species and habitats are most vulnerable to decline to direct resources where they will be most effective. To address this need, The North Atlantic LCC made two early investments in overall regional vulnerability assessments for species and habitats that are now complete. NatureServe and Heritage Program collaborators have developed a *Climate Change Vulnerability Index* to provide a rapid, scientifically defensible assessment of species' vulnerability to climate change. The vulnerability index integrates information about exposure to altered climates and species-specific sensitivity factors known to be associated with vulnerability to climate change. This project applied the vulnerability index to 64 species selected in collaboration with state wildlife experts, the LCC Technical Committee, and Manomet Center for Conservation Sciences. Species selected for assessment represented Federal Trust species of high responsibility by the North Atlantic LCC; foundational species for habitats that were assessed for climate change vulnerability by Manomet; and Species of Greatest Conservation Need as identified by the NEAFWA. The North Atlantic LCC also supported the second phase of a regional project to study *Vulnerabilities to Climate Change of Northeast Fish and Wildlife Habitats*. This project built off a first phase of work funded by Northeast states through the Regional Conservation Needs program on the vulnerability to climate change of additional Northeastern habitat types resulting in three reports on regional vulnerabilities to terrestrial habitats, cold water fish habitat and coastal habitats. The project also resulted in the creation of a database of ongoing coastal climate change projects and tools, the Northeast Climate U.S. site <http://www.neclimateus.org/>. Both the species and habitat vulnerability assessment reports are undergoing peer review and the reports will be released in final form in 2014.

Assessing the Vulnerability of Piping Plovers and Sea-level Rise

The LCC has supported a project to assess the vulnerability of piping plovers and other beach dependent species to sea level rise and increased storms and to guide beach management decisions based on that assessment. The project *Forecast Effects of Accelerating Sea-level Rise on the Habitat of Atlantic Coast Piping Plovers and Identify Responsive Conservation Strategies* is a joint effort bringing together plover expertise from Virginia Tech with the sea level rise impact expertise from the USGS Woods Hole Science Center. The initial phase of that project successfully piloted the approach on Assateague Island, Virginia and efforts to expand the approach to several other areas in the North Atlantic will move forward in 2013 through Hurricane Sandy resiliency funding. The ultimate goal is to have North Atlantic wide vulnerability assessment and decision support for beach dependent species.



Don Freiday/USFWS



USFWS

Forecasting Resilience of Brook Trout

Just as piping plover may be a sentinel of the effects of climate change through rising sea levels, brook trout may be an indicator of the effects of changing temperatures and stream flows due to climate change. Brook trout depend upon cold, clean, fast-moving streams for survival. Warming air temperatures, which are predicted given current trends and global climate models, can be expected to increase stream temperatures. However, the effects on brook trout are complicated because a number of other interacting factors also affect stream temperature and brook trout health. In 2013, the North Atlantic LCC continued to support a project led by the U.S. Geological Survey to forecast future changes in stream temperature across the Northeast and the capacity of streams to support brook trout. 2013 accomplishments included development of a regional occupancy model that projects how changes in stream temperature and forest cover (which buffers against temperature and flow changes) could affect where brook trout will persist. The assessments of landscape change due to climate change, urban growth and forest succession from the LCC Designing Sustainable Landscapes project will be input into this projects projection of impact on stream temperature and brook trout.

Communication and Engagement


The North Atlantic LCC is committed to developing effective communication products to enhance connections among partners and partnerships, develop and sustain the LCC partnership, attract new partners, support existing funding, and seek new funds, improve internal and external relations, and raise awareness of LCC priorities targeted to specific audiences. In 2013, the LCC developed a communications framework that outlines key communications objectives, strategies, tools and core messaging. The framework will be adjusted and enhanced periodically with input from

the North Atlantic LCC Steering Committee, LCC staff and communications specialists within and outside the partnership. Notable accomplishments in 2013 include:

- Upgrading and revising the North Atlantic LCC website to feature an expanded range of news and information as well as link to information sharing sources such as Data Basin. The website also includes partner news and newsletters. In the coming year, the LCC plans to expand the site's image library and multimedia section to better reflect the "people" aspect of the LCC.
- Supporting a partner website for Atlantic Salmon.
- Launching a quarterly electronic newsletter distributed within the partnership and to external target audiences.
- Supporting legislative visits in December to highlight the work of the LCC to select lawmakers and appropriators in the Northeast Region.
- Participating in regional and national LCC communications planning efforts to ensure consistent and effective communications about the network, as well as individual LCCs and USGS Climate Science Centers.
- Expanded internal communications with the U.S. Fish and Wildlife Service to increase understanding of LCC tools, landscape conservation design process and partnership.
- Providing communications support for the Connecticut River watershed landscape design pilot.

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Providing the Foundation

One of the chief road blocks to large-scale, collaborative planning and action for conservation envisioned by the North Atlantic LCC partnership is the lack of accessible high-quality, regionally consistent information about fish, wildlife and plant species, habitats, and landscapes. Such information serves as the foundation upon which partners can build planning tools and set strategic priorities for effective conservation action. Consequently, since its inception the North Atlantic LCC has placed a high priority on creating, organizing, and making available foundational data and information at scales and in the formats that partners need. [Learn more](#)



North Atlantic LCC Coordinator
Andrew Milliken

Charting a Course for the Future

The North Atlantic LCC has developed the partnership and capacity needed to achieve its mission and has supported projects consistent with the Northeast Conservation Framework and LCC strategic plan. These projects along with a number of other LCC partner projects are now at the stage where information and tools are becoming available. The LCC is making this information and these tools easily available through both the Conservation Planning Atlas and LCC website as well as through direct delivery of data to states and other partners. An important application of information management and delivery in 2013 was the synthesis of regional species and habitat information to provide regional context for State Wildlife Action Plan updates.

Looking forward, the LCC will be demonstrating approaches to most effectively integrate and translate information to scales and formats that partners need to make conservation decisions and tools through a program of science delivery including capacity, grants, training and demonstration projects. The LCC will be learning about how to most effectively collaborate in the integration of

spatial data and tools through development of conservation designs in landscapes across the LCC beginning with a pilot in the Connecticut River Watershed. The outcome of these landscape conservation designs will be the ability to guide decisions about how much of what conservation actions are needed where to sustain natural and cultural resources across the region and landscapes within the region to achieve partner-defined goals and objectives.

The partnership, capacity and science of the LCC has been and will continue to be demonstrated in our important role in helping to coordinate and deliver Hurricane Sandy science projects that will improve decisions related to increasing resiliency of beaches, marshes and streams in the face of sea level rise and storms. For all of these efforts, we are and will be increasing the breadth and frequency of our communications to ensure that various audiences know about and have the opportunity to become more engaged in the partnership and work of the North Atlantic LCC.

For more information on the North Atlantic LCC, visit www.northatlanticlcc.org.



North Atlantic LCC Steering Committee

North Atlantic LCC Leadership



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For more information, please visit the North Atlantic LCC website, <http://www.northatlanticlcc.org>

For information on the national network of LCCs, visit <http://www.doi.gov/lcc/index.cfm>

