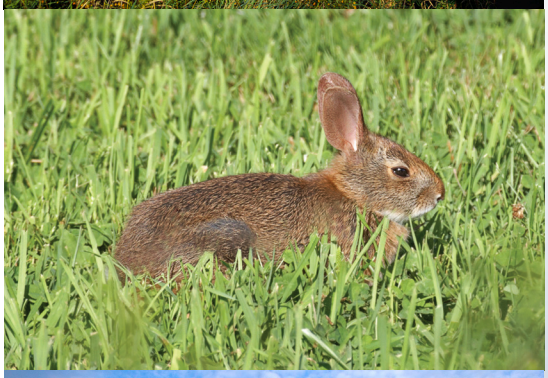
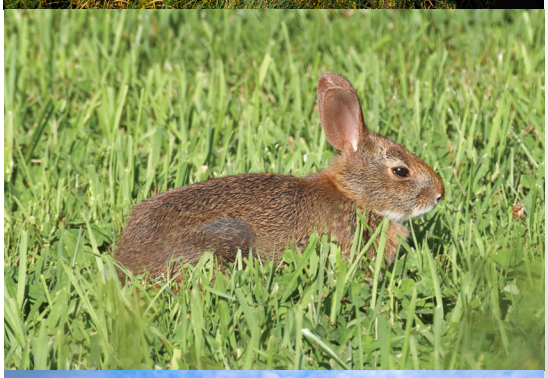


North Atlantic LCC
North Atlantic Landscape Conservation Cooperative

LANDSCAPE CONSERVATION COOPERATIVES

North Atlantic Landscape Conservation Cooperative

2012 Highlights



About NALCC

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.

Our 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.

Our Work

- Coordination and Organization: Provide structure, staff and process that brings together and coordinates partners, develops consensus on common goals, and builds on and integrates existing partnerships and capacity. This includes leveraging and generating funding and other resources; prioritizing and developing scientific information and tools to make conservation more effective; and evaluating progress toward partnership goals 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.

- 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.

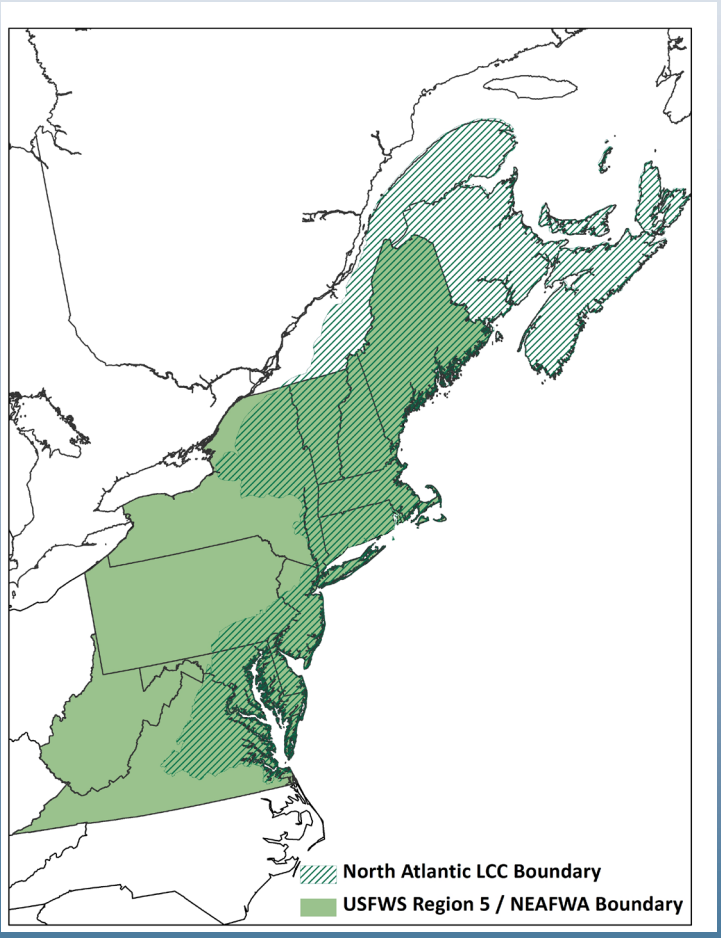
Photo captions from top; Mountain in the Catskills, NY, New England cottontail, Silvio O. Conte National Fish and Wildlife Refuge, Brook trout, Tidal stream going through high marsh in Downeast Maine

- 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.



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)

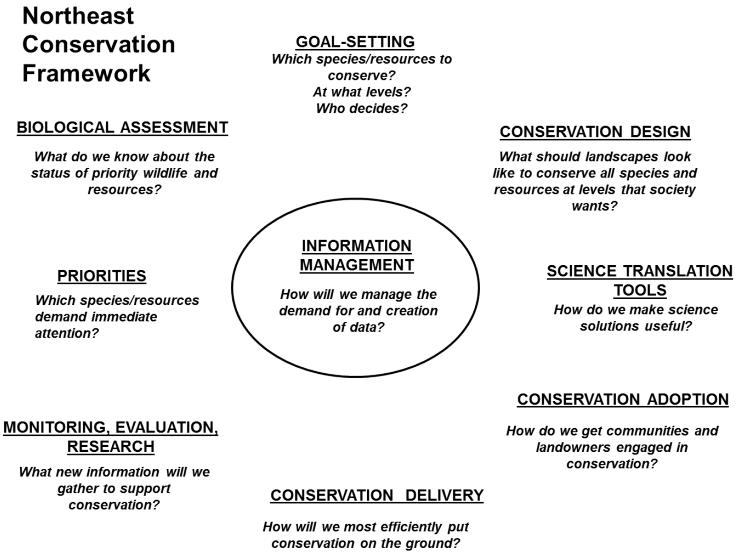
Looking Forward

In the face of land use pressures and widespread resource challenges such as climate change and urban growth, the North Atlantic Landscape Conservation Cooperative took bold steps in 2012 to realize its vision of landscapes capable of sustaining natural and cultural resources and contributing to the well-being of people.

In the pages that follow, you will read about dozens of highlighted North Atlantic LCC projects and activities 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.

These efforts include:

- building greater capacity to translate existing science and information into forms that can help partners make conservation decisions and assisting partners in testing and adopting existing science and tools;
- laying the groundwork for a fully functional system to 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
- strengthening the bonds between agencies and organizations working together for conservation beyond individual borders and boundaries.



As we look toward 2013, the North Atlantic LCC is poised to make even greater strides toward informing and supporting conservation decisions and actions; leveraging resources and expertise of partner agencies and organizations in an era of budget uncertainty; and helping to further integrate and strengthen the nationwide network of 22 LCCs and broader conservation community as we respond to the conservation challenges of the 21st Century.

To focus our work and determine shared priorities in a landscape that is constantly changing, we will continue to work with all the partners in the LCC to establish conservation targets that reflect the missions of partner agencies and organizations. This approach includes providing science capacity to select and use representative (surrogate) species for comprehensive conservation planning and designs to support multiple species and habitats within the region.

In the coming year the LCC will continue to support the critical efforts of providing regional information and context for State Wildlife Action Plan updates in the Northeast. The LCC is also poised to play a lead role in integrating and applying science to inform actions being taken to increase the resiliency of natural systems and communities in response to Hurricane Sandy and Tropical Storm Irene.

The North Atlantic LCC can be proud of its accomplishments in the past year, but we are continually looking forward. As a community of federal agencies, states, tribes, universities and private organizations, our ultimate goal is to achieve a larger landscape conservation vision no single jurisdiction or organization could achieve on its own.

Nulhegan River

Working Across the Landscape

Northeast Landscape Conservation Design and Synthesis

A broad range of partners in the Northeast have indicated that in addition addressing priority science needs, the North Atlantic LCC needs to compile, synthesize, map, translate and help partners get access to and adopt existing science and tools. Following the Northeast Conservation Framework, the states and LCCs 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 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 for State Wildlife Action Plan (SWAP) revisions. Compiled information on species and habitats will provide a regional context for SWAP elements and will be available for voluntary inclusion into each state's plan via a dynamic, web-based information management system.

Northeast Climate Science Center

The North Atlantic LCC was a key contributor to the establishment and operations of the new Northeast Climate Science Center (CSC). The Northeast CSC is one of eight regional CSCs established by the U.S. Geological Survey (USGS) to deliver climate change impact science to LCCs and other parties. In addition to USGS leadership, the Northeast CSC consists of a consortium of eight institutions from across the Northeast-Midwest area that is led by the University of Massachusetts-Amherst. In 2012, the North Atlantic LCC led an effort with neighboring LCCs and the Northeast CSC to develop its first set of grant requests and then to review and select the resulting project proposals. As a result, the Northeast CSC awarded seven grants to deliver climate-related science that will benefit the North Atlantic and other LCCs. Examples include projects to compile and model data on regional stream temperatures (which will be useful in conserving cold-water fish species such as trout) and evaluating the impacts of sea-level rise in the Northeast region.

Sea-Level Rise Structured Decision Making

Structured decision making to address landscape conservation for sea-level rise adaptation is based on the need to support allocation decisions in a regional context in the North Atlantic LCC with an understanding of both the impact and uncertainty associated with sea-level rise and storm impacts to coastal habitats. This need was identified by the LCC coastal and marine technical committee – LCC staff and partners subsequently assembled a team for a structured decision making workshop in September 2012. The assembled team included partners from the U.S. Fish and Wildlife Service, National Park Service, U.S. Geological Survey, Atlantic Coast Joint Venture, New Jersey Department of Environmental Protection, Delaware Fish and Wildlife, and The Nature Conservancy. The focus of the workshop was supporting decisions made by LCC partners related to sea-level rise adaptation – where to invest how much of what resources to sustain coastal habitats, species and ecosystem services with an initial focus on beaches and tidal marshes. Specific options include managing and enhancing existing coastal habitats, restoring habitats to their former location and condition and protecting adjacent uplands to allow for coastal habitats to migrate and adapt to sea-level rise and storms. The U.S. Geological Survey Coastal and Marine Geology Science Center is using the results of the workshop to develop decision support models for decisions at regional and local scales.

Featured Science Projects

For more details on these and other North Atlantic LCC projects, visit http://www.northatlanticlcc.org/projects

Designing Sustainable Landscapes: Connecting with Partners

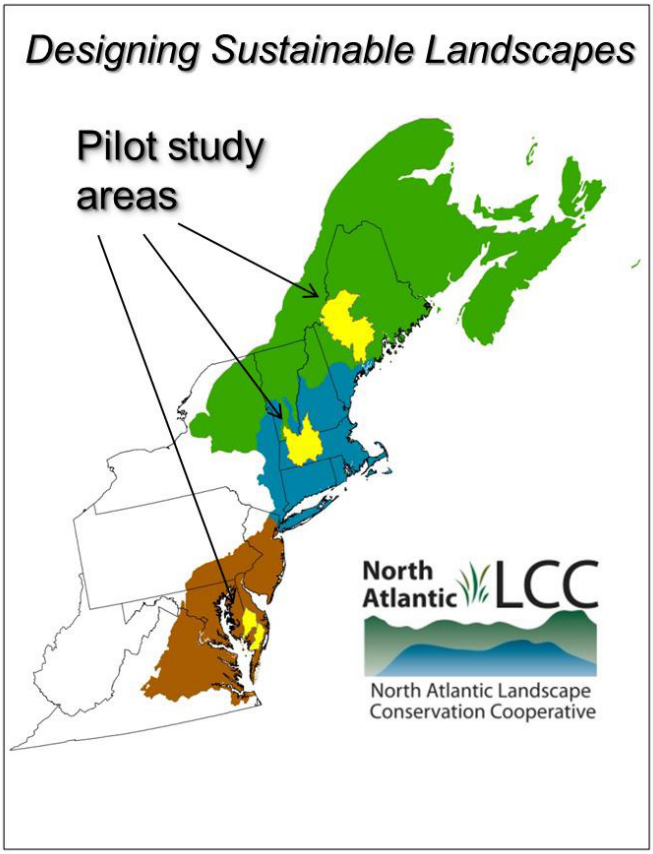
In October 2012, North Atlantic LCC and U.S. Fish and Wildlife Service staff worked with University of Massachusetts-Amherst to conduct three one-day workshops to introduce conservation managers and other partners to the initial results of the Designing Sustainable Landscapes project, to engage them in developing useful and relevant conservation tools and to begin a longer-term collaboration on shared conservation goals.

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 of all the habitat types in the Northeast, 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. During the first phase of the project, the approach was developed in three pilot study areas: the Kennebec River watershed in Maine, the middle Connecticut River in Massachusetts and adjacent states, and the Pocomoke and Nanticoke River watersheds in Delaware and Maryland.

A workshop was held in each of the three pilot areas and more than 100 conservation managers participated from a diverse array of organizations (along with others online). Organizations represented include: NOAA, National Park Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, Chesapeake Conservancy, Connecticut River Watershed Council, Ducks Unlimited, Maine Audubon, National Wildlife Federation, The Nature Conservancy, Trout Unlimited, Trust for Public Land, Maine Department of Inland Fisheries and Wildlife, Maryland Department of Natural Resources, and Massachusetts Division of Fisheries and Wildlife.

Participants posed questions and offered a number of valuable suggestions as the project enters its second phase, which will include developing the landscape design portion of the project and expanding the project to the entire Northeast region. Overall, participants were enthusiastic about the progress of the project and envisioned using tools in conservation planning. LCC and UMass staff will be seeking, compiling and synthesizing additional input through emails, an online survey and follow-up meetings. LCC staff are also contacting participants to gauge their interest in longer-term involvement in the project and exploring how to organize that work. One possible model would be to organize standing groups focused on areas with existing regional partnerships such as the Gulf of Maine, Connecticut River watershed and Chesapeake Bay.

For more information on Designing Sustainable Landscapes, visit http://www.umass.edu/landeco/research/nalcc/nalcc.html



Assessing 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, 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 will apply the vulnerability index to 60 species to be selected in collaboration with state wildlife experts, the Science Technical Review committee of the North Atlantic Coast, and with Manomet Center for Conservation Sciences. Species selected for assessment will represent Federal Trust species of high responsibility by the North Atlantic LCC; foundation species for habitats currently being assessed for climate change vulnerability by Manomet; and Species of Greatest Conservation Need as identified by the Regional Conservation Needs program. The North Atlantic LCC also has entered phase two of a project to study Vulnerabilities to Climate Change of Northeast Fish and Wildlife Habitats. This project will build off a first phase of work funded by Northeast states through the Regional Conservation Needs program. Vulnerability to climate change of 7-10 additional northeastern habitat types, including forests, wetlands, and aquatic systems, will be assessed. Tidally-influenced habitat vulnerability will also be assessed and will include development of a database of ongoing coastal climate change projects and tools.

Lighthouse and light keeper's house at Monomoy National Wildlife Refuge on Cape Cod in Massachusetts.

Piping Plovers and Sea-level Rise

This collaborative project of the North Atlantic LCC will provide biologists and managers along the Atlantic coast with tools to predict effects of accelerating sea-level rise on the distribution of piping plover breeding habitat, test those predictions, and feed results back into the modeling framework to improve predictive capabilities. Immediate model results will be used to inform a coast-wide assessment of threats from sea-level rise and related habitat conservation recommendations that can be implemented by land managers and inform recommendations to regulators. Case studies incorporating explicit measures to preserve resilience of piping plover habitat to sea-level rise into management plans for specific locations will demonstrate potential applications.

Piping plover

Forecasting Changes in Aquatic Systems and Brook Trout Resilience

The objective of this project is to develop a web-based decision support system for evaluating effects of alternative management scenarios on local population persistence of brook trout under different climate change scenarios. This includes:

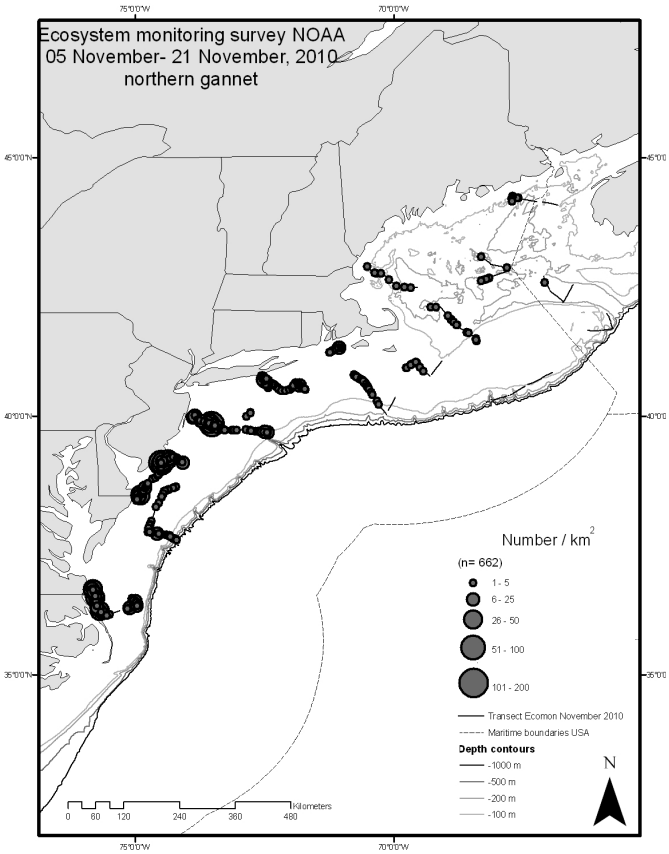
- developing a hierarchical modeling framework to account for multiple scales and sources of uncertainty in climate change predictions;
- developing statistical models to predict stream flow and temperature based on air temperature and precipitation;
- incorporating climate change forecasts into population persistence models; and
- developing a decision support system for evaluating effects of alternate management strategies in the face of climate change.

Models have been completed for stream flow and local (catchment scale) population persistence of brook trout. Other projects under development include applications to link forecasts of future precipitation and air temperature to the local population model and large-scale brook trout occupancy models to complement the more data-intensive population models.

Brook trout

Marine Bird Mapping and Assessment

This project will develop a series of maps depicting the distribution, abundance and areas of high, medium and low risk to marine birds from offshore activities (e.g., energy development) in the northwestern Atlantic Ocean. This collaborative project will pull together data from a variety of sources including: ships of opportunity, aerial surveys, species specific telemetry studies, and the historic marine bird database (from the 1970s to present) maintained by the U.S. Geological Survey (USGS). These data will be used to model distribution and abundance patterns of many species to inform decisions about siting offshore activities such as wind turbine installations, marine spatial planning efforts, or other uses requiring maps of seabird distributions, such as identifying marine protected areas. In October 2012, North Carolina State University hired a postdoctoral researcher to lead the seabird modeling effort. The Biodiversity Research Institute is providing new seabird data to the USGS seabird database to be used in modeling.



Ships of Opportunity Survey Data Example

North Atlantic LCC: 2010-2013 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

Consistent Regional Coastal Mapping – NWI Updates
End Date: September 2013
Project Leader: Scott Klopfer
Organization: Conservation Management Institute at Virginia Tech

Decision Support Tool to Assess Aquatic Habitats and Threats in North Atlantic Watersheds
End Date: January 2015
Project Leader: Fritz Boettner
Organization: Downstream Strategies

Designing Sustainable Landscapes, Phase 1
End Date: June 1, 2012
Project Leader: Kevin McGarigal
Organization: University of Massachusetts-Amherst

Designing Sustainable Landscapes, Phase 2
End Date: June 1, 2013
Project Leader: Kevin McGarigal
Organization: University of Massachusetts-Amherst

Extending the Northeast Terrestrial Habitat Map to Atlantic Canada
End Date: February 28, 2015
Project Leader: Mark Anderson
Organization: The Nature Conservancy

Forecasting Changes in Aquatic Systems and Resilience of Brook Trout
End Date: December 31, 2013
Project Leader: Ben Letcher
Organization: University of Massachusetts-Amherst

Marine Bird Mapping and Assessment
End Date: December 31, 2013
Project Leader: Beth Gardner
Organization: North Carolina State University

Permeable Landscapes for Wildlife in the Northeast
End Date: December 31, 2013
Project Leader: Mark Anderson
Organization: The Nature Conservancy

Piping Plovers and Sea-level Rise
End Date: December 31, 2013
Project Leader: Sarah Karpanty
Organization: Virginia Tech

Priority Amphibian and Reptile Conservation Areas (PARCAs)
End Date: December 31, 2014
Project Leader: Priya Nanjappa
Organization: Association of Fish and Wildlife Agencies

Refine Northeast Aquatic Habitat Classification
End Date: September 2013
Project Leader: Mark Anderson
Organization: The Nature Conservancy

Terrestrial Wildlife Habitat Models
End Date: September 30, 2011
Project Leader: Therese Donovan
Organization: University of Vermont

Virginia Piedmont and Coastal Plain updates to Northeast habitat map
End Date: June 23, 2012
Project Leader: Mark Anderson
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
Organization: Manomet Center for Conservation Science

Outreach and Engagement

Highlights:

The North Atlantic LCC is committed to developing strategies, tools, methods and actions to enhance communications and engagement 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. Here are some key outreach efforts in 2012:

Worldviews

The North Atlantic LCC was featured in an exciting event in December 2012 at the American Museum of Natural History's Hayden Planetarium in New York City. In a program created especially for planetariums by Worldviews Network, titled, "Earth, Migrations and the Human Effect," the Museum's Director of Astrovisualization Carter Emmart and NOAA's Dr. Ned Gardiner narrated a live experience looking at the patterns of the sun, seasons, climate and their effect on migratory species and local ecosystems. This program demonstrated how large-scale changes, like changing climate and urban growth, have the potential for dramatic impact on life around the planet. The program showed how scientists from NOAA, NASA, the U.S. Fish and Wildlife Service, the North Atlantic LCC and collaborators examine the influence of these impacts on patterns of life including breeding, migration and wintering areas for highly migratory wildlife species. North Atlantic LCC staff served as advisors to this planetarium program and contributed information from LCC projects including the comprehensive Designing Sustainable Landscapes project. The event provided an excellent opportunity to share information on the importance of the LCCs and the North Atlantic LCC in providing a regional forum, information, and tools to help ecosystems adapt to a changing climate.

Photo courtesy Worldview Network

eBird animated occurrence maps for the Blackpoll Warbler.

Outreach with Local Planners

North Atlantic LCC staff and partners helped organize and participate in the *Northeast Landscape Conference: Improving Conservation Practice in the Northeast Megaregion* hosted by the Regional Plan Association that included many regional and local planners and land trusts. North Atlantic LCC staff organized a session with the Open Space Institute and The Nature Conservancy on addressing climate change in regional and local planning. Partners agreed it is critical to make data and modeling tools consistent across the region and ensure that local land trusts, conservation groups, and planners use this information. Partnerships between LCC agencies and organizations – including state agencies with land trusts and planners – can build the capacity needed to address communication, mapping, and science interpretation issues. North Atlantic LCC staff, Maine Department of Inland Fisheries and Wildlife and Manomet Center for Conservation Sciences also met with the Northern New England Chapter of the American Planning Association to present information on LCC science and tools to community planners. The planners there emphasized the importance of translating information for use by towns, the recognition of the limited capacity at the local level and the need to work individually with towns. Looking forward, the LCC will be developing information management systems to meet local needs and the capacity for science delivery to work with communities.

Tribal Outreach

North Atlantic LCC staff began meeting regularly with the Natural Resources Committee of the United South and Eastern Tribes (USET) to update them on the activities of the LCC and seek their input on priority conservation science needs. There are 27 federally-recognized tribes in the USET area from Maine south to Florida and east to Texas with 12 of these tribes located in the North Atlantic LCC geographic area. USET passed a resolution in 2010 supporting participation in LCCs but have found it challenging to keep track of activities and needs of multiple LCCs and Climate Science Centers (CSCs). North Atlantic LCC staff responded by organizing input and participation from the seven LCCs and two Climate Science Centers in the USET area. In the coming year, North Atlantic LCC staff and partners working with U.S, Fish and Wildlife Service will also begin a series of tribal forums starting with a forum in Maine this summer.

Sharing Information

Information Management Needs Assessment

During 2012, the North Atlantic LCC Information Management Team completed a needs assessment with the assistance of contractor Applied Geographics. The team and contractor designed an online survey, conducted interviews with key partners and held focus groups with additional stakeholders. The team received 110 responses to the online survey and compiled results, focus group input and recommendations into a final report. A well-designed information management system will be key in providing improved conservation coordination, planning, design, monitoring, research and partner communications across the North Atlantic region. Interviews with North Atlantic LCC member organizations helped determine existing information management resources and identify problems that require information technology solutions. The study outlined a vision to meet shared stakeholder needs and frame reasonable goals that can be accomplished in the near-term. At its highest level, the vision calls for establishing an information management system that will support:

- science and technical expertise needed to support conservation planning at landscape scales;
- strong collaboration among the membership in defining shared conservation goals; and
- data and tools that facilitate planning to help deliver "conservation on the ground."

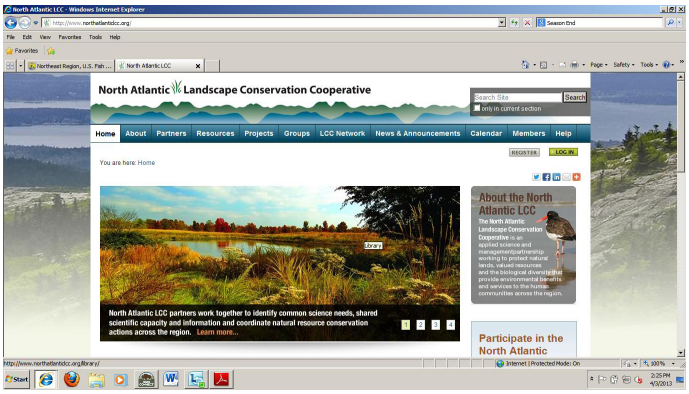
The study also presents three overarching strategic goals that identify high-level objectives:

- design and create a regional information management system (IMS) capacity that is available to all partners;
- populate the information management system with relevant, region-wide data and then actively steward those data to keep them current; and
- provide tools for accessing and portraying the data within the information management system to enable members to perform analysis and visualization.

The next step toward achieving the vision will be for the North Atlantic LCC to consider these needs, establish priorities and design a specific technical solution.

North Atlantic LCC website

In 2012, staff expanded functionality for the North Atlantic LCC website (http://www.northatlanticlcc.org) to include background and contact information on the LCC, specific meeting information, active projects, links to additional resources and news and events. The LCC worked with the contractor to refine the website and content management system with geo-referencing and integrated networking that serves web, document sharing, social networking and data portal functions. The interactive platform will allow anyone to share information of interest and utility to the partnership and other target audiences.



Webinars

Webinars continue to be an effective way to share information and science tools within and beyond the North Atlantic LCC. These are collected and posted on the North Atlantic LCC website: http://www.northatlanticlcc.org/resources/webinar-and-video-library

Key topics include:

- Regional Conservation Needs, LCCs and a Conservation Framework for the Northeast ;
- Evaluating the Vulnerabilities of Ecological Resources to Climate Change in the Northeast ;
- Effects of Sea-level Rise and Altered Storminess on Piping Plover Breeding Habitat Along the U.S. Atlantic Coast
- Providing Science and Tools in Support of the North Atlantic Landscape Conservation Cooperative: Designing Sustainable Landscapes for Wildlife; and
- Modeling Population Persistence Across the Streamscape.

North Atlantic LCC Leadership

Ken Elowe, U.S. Fish and Wildlife Service Steering Committee Chair ken_elowe@fws.gov

Patricia Riexinger, New York State DEC Steering Committee Vice-chair pxriexin@gw.dec.state.ny.us

Andrew Milliken, North Atlantic LCC Coordinator andrew_milliken@fws.gov

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

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North Atlantic Landscape Conservation Cooperative

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