**The Northeast Regional Conservation Framework**

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**Abstract**

Conservation partners in the northeastern United States, including state fish and wildlife agencies and Landscape Conservation Cooperatives (LCCs), are working together to implement landscape conservation practices, projects, and organizational structures supporting the development and application of scientific conservation planning and management. In 2006, the Northeast states developed an innovative Regional Conservation Needs (RCN) granting program ([www.rcngrants.org](http://www.rcngrants.org)) supported by a four percent contribution of State Wildlife Grant funds from each state that from 2007-2012has resulted in the implementation of twenty-seven projects that transcend geopolitical boundaries. Landscape Conservation Cooperatives in the Northeast including the North Atlantic, Appalachian, South Atlantic and Upper Midwest Great Lakes were formed in 2010 as regional conservation science-management partnerships. They consist of federal agencies, states, tribes, universities and private organizations, and are focused on collaboratively developing science-based recommendations, decision-support tools and shared science capacity to guide effective conservation of species and other natural resources at landscape scales. The states and LCCs hosted a workshop of Northeast partners in June, 2011 to review progress and prioritize next steps for multi-species conservation. They developed the Northeast Regional Conservation Framework (Northeast Framework) to articulate what they are collectively trying to achieve, the steps necessary to get there, who will do what, and how they will know when they get there. 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. A complementary effort involves the development of a SWAP database and common lexicon to promote consistency in the next generation of SWAPs, allowing regional rollup, revisions, and accessibility of information on species, threats, and needed management actions.

**Introduction**

The northeast United States is recognized for collaborative landscape conservation practices, projects, and organizational structures supporting the development and application of scientific conservation planning and management. The most visible aspect of the collaborative effort is the delivery of major tools and science products, such as regional habitat classifications and maps. The collaborative approach in the Northeast is collectively referred to as the Northeast Regional Conservation Framework (Northeast Framework). The purposes of this paper are, first, to document the Northeast Framework key operational lessons and successes that make multi-jurisdictional collaboration possible, and second, to describe projects and results that serve as foundational elements in establishing landscape scale scientific planning and management for the Northeast. Last, we summarize key next steps and adaptations for delivering collaborative scientific planning and management at the regional scale.

**Regional Conservation Planning in the United States**

State, federal and non-governmental organizations participate in regional conservation planning in a variety of ways. In the federal realm, two Bureaus in the Department of the Interior, the U.S. Fish and Wildlife Service (Service) and U.S. Geological Survey, have adopted adaptive management guidance and an approach referred to as Strategic Habitat Conservation (SHC) (U.S. Fish and Wildlife Service and U.S. Geological Survey 2006; U.S. Fish and Wildlife Service 2008). SHC recognizes self-sustaining populations of fish and wildlife, in the context of landscape and system sustainability, as an overarching target of conservation. SHC relies on an adaptive management framework to inform decisions about where and how to deliver conservation efficiently to achieve predicted biological outcomes. The SHC approach is built on five main components of adaptive management: Biological Planning; Conservation Design; Conservation Delivery; Outcome-based Monitoring; and Assumption-driven Research, and allows the organization of different capacities and capabilities towards common biological outcomes.

From a state perspective, State Wildlife Action Plans (SWAPs) provide a framework and an opportunity to advance regional-scale scientific planning and management. Funds for planning and management of Species of Greatest Conservation Need identified in SWAPS are administered through the State Wildlife Grants (SWG) program and can be applied to regional priorities. Guidance from Congress required each state to prepare a comprehensive Wildlife Action Plan addressing eight elements (U.S. Fish and Wildlife Service and Association of Fish and Wildlife Agencies, 2007) that represent a similar version of a conservation planning and adaptive management framework to SHC. This guidance, though extensive, was directed solely towards conservation within state borders and did not address planning across jurisdictions.

Much has been written about adaptive management at the scale of local sites, for single species management systems, or for certain ecological systems. However, there are few examples of comprehensive adaptive management of resources across a range of ecosystems at the landscape scale. In the face of great uncertainty, more comprehensive systems of conservation planning and adaptive management are needed to address driving landscape stresses, such as urban growth and climate change, which require large-scale coordination and planning. New information technologies have significantly improved our capacity for integration and implementation of conservation planning and adaptive management at regional, continental and global scales. Specifically, foundational spatial data such as land use and land cover, geology and hydrography along with location and extent of species and suitable habitats can be mapped at true extents of their distributions using current Geographic Information Systems (GIS) technologies. Advances in information management and computation speed have made large landscape analysis widely accessible, stimulating burgeoning growth of landscape-analysis tools to support conservation planning and decision-making. The availability of such powerful tools necessitates a corresponding development of planning and operational structures in the organizations that stand to benefit from their application. These new tools must be integrated into existing organizational capacity and work flow to realize their full potential for improving effectiveness of conservation actions.

**Conservation in the Northeast Region**

The Northeast has a long legacy of inspired landscape conservation and natural resource management. In 1864, George Perkins Marsh, resident of Woodstock, Vermont, published *Man and Nature*, which framed the early conservation ethic. Later, notable conservation icons such as Bernhard Fernow, Theodore Roosevelt, and Gifford Pinchot, each residents of the Northeast, held state and federal offices from which they influenced the establishment of the National Park System, the Forest Service, the Adirondack Park, and the first National Wildlife Refuge. Through both state and federal institutions, they advocated for and integrated the foundations of scientific management and planning (James 1999). In the Northeast, our leadership is now acting upon the availability of new technologies to advance a new revolution in conservation.

The Northeast Region includes 13 states, the District of Columbia, 17 federally recognized tribes and a shared border with 5 Canadian provinces. Home to 25 percent of the nation’s population and made up of primarily private lands, the region’s complex environment is heavily influenced by human disturbances. Forestry, industrialization, resource extraction and urbanization have placed severe demands on the native fauna and flora, making the protection of remaining habitats and populations critical to maintaining the region’s biodiversity. Now the multiple effects of development, energy extraction, and accelerated climate change add growing threats to already imperiled habitats and species, with potentially vast environmental and economic consequences.

The Northeast Region encompasses a wide diversity of coastal and inland ecosystems and habitat types as shown in the Northeast Terrestrial Habitat Map (Figure 1). Diverse ecosystems and habitat types support an equally diverse set of fish and wildlife resources, but many of these natural resources are vulnerable to urbanization, energy development and forest management practices. In the report commissioned by the Northeast Association of Fish and Wildlife Agencies entitled “Conservation Status of Fish, Wildlife, and Natural Habitats”, Anderson et al. (2011) documented the condition of fish and wildlife and their habitats. These include

* + The majority of the region’s watersheds still retain 95-100 of their native fish species, but are also home to up to 37 non-indigenous species;
  + The range of native brook trout, a species that prefers cold high-quality streams, has been reduced by 60 percent;
  + 27 percent of riparian areas have been converted and only 14 percent are secured.
  + On average, 43 percent of the forest occurs in blocks less than 5,000 acres in size that are completely encircled by major roads, resulting in an almost 60 percent loss of local connectivity;

Few landscapes, species populations, or habitats are contained within, or managed by, a single state; therefore the Northeast agencies have a long history of collaborating across boundaries and jurisdictions to facilitate cohesive resource management policies for species and habitats. Examples of existing regional partnerships that represent a broad range of agencies and organizations include the Northeast Association of Fish and Wildlife Agencies, Landscape Conservation Cooperatives, Joint Ventures, Fish Habitat Partnerships, Atlantic States Marine Fisheries Commission, and the New England Governors Commission on Land Conservation.

In response to resource management needs, the Northeast has initiated, and completed, steps toward building a regional conservation network as part of a national network. Through the Regional Conservation Needs (RCN) program and Landscape Conservation Cooperatives (LCCs), they have already taken several steps toward a state-based national network for effective wildlife conservation suggested by Meretsky et al. (2012) :

* established common habitat classifications and maps across the entire northeast;
* identified regional SGCN (RSGCN) and surrogate species;
* coordinated and leveraged capacity for research and monitoring;
* facilitated and enhanced information dissemination; and
* developed a process for synthesis of regional data for SWAP revisions.

The RCN program and the North Atlantic LCC have collaborated to make major advances toward overcoming obstacles to regional conservation, including multi-jurisdictional governance, stability and consistency of funding, project prioritization, and a common framework for conservation.

**Overview of NEAFWA, RCNs, and LCCs**

**Northeast Association of Fish and Wildlife Agencies (NEAFWA)**

The Northeast Association of Fish and Wildlife Agencies is composed of the thirteen Northeast states and the District of Columbia, represented by the Directors of the respective state fish and wildlife agencies. Multi-state resource concerns and limited funding provide compelling justification for the states to collaborate in landscape and conservation initiatives.  The Northeast Fisheries Administrators Association (NEFAA) and Northeast Wildlife Administrators Association (NEWAA) work with standing and *ad hoc* species and habitat technical committees to provide recommendations to the Directors on vital resource concerns.  The development of guidance and recommendations on the regional application of State Wildlife Action Plans originates primarily from the Northeast Fish and Wildlife Diversity Technical Committee (NEFWDTC) which is composed of Wildlife Diversity Program Managers and State Wildlife Action Plan coordinators.   State biologists are often directly responsible for on-the-ground resource management decisions and recommendations.   Consequently, they are able to use their resource management observations as a foundation to identify regional needs and develop recommendations for NEAFWA.

Working across state lines with a mix of state and federal dollars is complex and extremely difficult, requiring adequate organizational and personnel resources to motivate, coordinate, monitor and report on project outputs and outcomes. The long history of cooperative management approaches in northeastern states and the strong organizational structure of NEAFWA provide the basis to address the challenge. For example, the Eastern Canada Cooperative Banding Project has been operating for over 40 years bringing together NEAFWA, the U.S. Fish and Wildlife Service, and the Wildlife Management Institute (WMI) in a conservation strategy that could not be achieved by an individual entity.

**Regional Conservation Needs (RCN)**

In 2006, the National Fish and Wildlife Foundation and Doris Duke Charitable Foundation provided support for regional meetings following the completion of the State Wildlife Action Plans. In the Northeast regional meeting, participants recognized that while each state had developed a Wildlife Action Plan that addressed the species and habitats of conservation concern within their boundaries, a portion of each Plan also contained common elements. These included species and habitats that span state boundaries and where much of the required tools and techniques were too costly or redundant if developed state-by-state. Further, it was recognized that natural resource conservation on a regional scale can yield more durable outcomes and leverage regional partners. The workshop resulted in the development of the Regional Conservation Needs (RCN) program.

In 2006, NEAFWA, WMI, and the Service drafted a proposal to create the RCN program. The Northeast state Directors approved the proposal and states agreed to contribute and pool four percent of their State Wildlife Grant (SWG) apportionments to fund cooperative work of regional importance. Proposals were first requested in 2007 and subsequent requests have resulted in the implementation of twenty-seven projects. On behalf of NEAFWA, WMI serves an essential role in program success by administering the entire process including requests for proposals, review of proposals, selection of projects, managing contracts, payments and reporting.

The purpose of the RCN program is to develop and coordinate projects that are regional/sub-regional in scope, to build upon the many regional initiatives that already exist and to complement ongoing work in individual states. Regional Conservation Needs are designed to be focused, necessary projects that have broad applicability to bring greater understanding to regional issues and landscape-scale conservation. They are developed by various taxonomic and habitat technical committees of the NEAFWA, refined by the NEFWDTC, the NEWAA, the NEFAA, and ultimately reviewed and approved by the NEAFWA Directors. Proposals are solicited through a request for proposals to the conservation community. These are reviewed and ranked by small technical review teams, refined, and submitted to the NEAFWA Directors with a recommendation for funding. The Service participates in the technical review of proposals and works closely with the WMI to screen proposals to ensure they are eligible, substantial in character and design, and comply with federal law and regulations. Additionally, the Service works with each of the Northeast States and the District of Columbia on grant documentation to obligate SWG funds, add approved projects, and document performance.

**Landscape Conservation Cooperatives**

Landscape Conservation Cooperatives were formally recognized as regional, self-directed, science-management partnerships by a Department of the Interior Secretarial Order in 2010 (U.S. Fish and Wildlife Service 2009; U.S. Department of the Interior 2010). The Secretarial Order stated that: “because of the unprecedented scope of affected landscapes, Interior bureaus and agencies must work together, and with other federal, state, tribal and local governments, and private landowner partners, to develop landscape-level strategies for understanding and responding to climate change impacts.”

The North Atlantic LCC (NALCC) was among the first LCCs to be established, bringing together federal agencies, states, tribes, universities and private organizations to develop scientific information and tools for conservation actions addressing species and habitats from Southeast Virginia north to Atlantic Canada. Critical issues facing this region include land use pressures and widespread resource threats (e.g., energy development) and uncertainties amplified by a rapidly changing climate. The LCC provides the structure, staff capacity, and processes to coordinate landscape conservation action among partners and across partnerships. LCCs serve as a forum to develop consensus on common goals and landscape designs for sustaining natural resources, develop applications for new science and technology, link science to conservation decisions and evaluate collaborative progress toward shared goals. The NALCC has a formal governance structure and is guided by a Steering Committee with 33 formal member agencies (including all state fish and wildlife agencies), organizations and technical teams that provide recommendations to the Steering Committee. The Service provides financial and staffing support to facilitate the partnership and annual project funding to help address priority science and science delivery needs. Additional staffing support is made available through the U.S. Geological Survey, National Park Service, U.S. Environmental Protection Agency and National Oceanic and Atmospheric Administration.

The NALCC recognized and built upon the many existing partnerships, and the processes and priorities put in place by those partnerships, particularly the work of NEAFWA through the RCN program, including the administrative role of WMI. In its first three fiscal years, the NALCC supported 19 science projects and 3 science delivery demonstration projects. Several of these projects were complementary to, and built upon RCN-funded projects. The NALCC as well as the Appalachian LCC have worked closely with NEAFWA to help ensure efficient and effective use of resources.

**The Northeast Framework**

The Northeast Regional Conservation Framework (Figure 2) was proposed and adopted at a workshop of Northeast Conservation partners in June, 2011 in Albany, New York. The Framework articulates what partners are collectively trying to achieve and the steps necessary to get there. The Framework then helps organize and prioritize work to best contribute to the common outcome and a conservation blueprint for landscape-scale ecosystems and habitats that will support the multiple species and natural resources that agencies are, collectively responsible for in the Northeast region. It helps us organize our individual capacities, responsibilities, and expertise and identify where each partner can best contribute. It illustrates the relationship among activities, identifies the information gaps, and shows the logical next steps in the process. Northeast states, federal agencies, and other conservation organizations recognized the value in the Framework because it shows the relationship of the projects and products developed through RCN, LCC, and other conservation efforts towards the outcome of landscapes supporting the species and resources that all partners are working towards.

The Northeast Regional Conservation Framework includes the essential components of the SWAP required elements, as well as the planning and adaptive management concepts of Strategic Habitat Conservation (SHC). The NALCC has adopted the Northeast Conservation Framework as the foundation of the LCC’s science strategic plan and has provided funding and capacity to develop the framework and work with partners for its implementation.The Northeast Conservation Framework represents a direction for the partnership and a willingness of the partners to collectively and intentionally work in an organized fashion towards a larger landscape conservation vision that no one jurisdiction or organization could achieve on its own. The Northeast Conservation Framework and the collaborative work that it represents through the Regional Conservation Needs Program and the North Atlantic and Appalachian LCCs represent the northeast conservation communities’ response to the huge conservation challenges that face us, and the intent to make significant and collaborative contributions to the future of natural resources in this region.

Compared to previous frameworks, the Northeast Conservation Framework places a higher priority on managing the flow of information among these elements (i.e., information management) and translating information to the scale and formats needed by decision makers. It also emphasizes the importance of working with partners to adopt the tools (conservation adoption). These elements are implemented through the LCC’s content-management website and data portal, and Science Delivery team.

**Governance Structures for Multi-Jurisdictional Decisions**

The North Atlantic LCC and NEAFWA coordinate governance in several ways. The LCC hosts its Steering Committee meetings in tandem at the annual spring NEAFWA conference and at the annual fall NEAFWA Director’s meeting. The two meetings correspond with review and approval of priority science needs and selection of projects. Opportunities for coordinated projects and complementary funding awards are identified and communicated among between NEAFWA and the LCCs though the Northeast Directors who are part of both partnerships. Examples include the LCC extending and developing climate change vulnerability assessments that complement the vulnerability assessments originally developed through the RCN process and supporting marine and coastal habitat mapping to complement the RCN terrestrial habitat map. Both the North Atlantic LCC and NEAFWA have developed partnerships with the Wildlife Management Institute to provide administrative capacity to jointly fund priority needs, assess progress and communicate results.

**Results and Products of Collaborative Conservation in the Northeast Region**

The results of the collaborations developed by the states, LCCs and other partners and partnerships in the northeast region include the tools to make informed conservation decisions in the face of multiple threats and uncertainty including impacts of changing land use and climate and the development of governance structures to make decisions toward common goals. 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 for the northeast and provide regional context for state and local actions. Although there is not room here to provide details on these projects, that information is available for RCNs and LCCs on their respective websites (<http://rcngrants.org/>, <http://www.northatlanticlcc.org/>, and <http://applcc.org/>)

**Synthesis of Regional Information for State Wildlife Action Updates**

An essential outcome of the northeast collaborative effort is a synthesis of regional conservation information, which will provide a regional landscape designs and context for elements in individual State Wildlife Action Plans (SWAP). The synthesis is envisioned as set of components for voluntary incorporation into each state’s SWAP update. Products will be available in a dynamic web-based information management system. A complementary effort involves the development of SWAP database and a common lexicon to promote consistency in the next generation of SWAPs, and improve accessibility and allow comparison of SWAP elements among states. The collective effort will provide many foundational scientific planning and management tools.

This synthesis is a great example of the collaboration of states, LCCs and partners around the Northeast Conservation Framework. The LCC is contributing: a common regional SGCN screening process; multi-jurisdictional SGCN data sharing and compilation; an assessment of species distributions and habitats; regional landscape conservation designs; and data and scenario planning. The RCN program will deliver: habitat maps and assessments of habitat condition; standardized summaries of regional plans, threats, and actions; regional summaries for each SWAP chapter; a common planning lexicon; and a regional SWAP database.

**Discussion and Summary**

**Lessons Learned**

Define beneficial outcomes and efficiencies of regional collaboration first

In the context of working across jurisdictions, there is a natural tension between collaboration and autonomy. We recommend cultivating a common understanding at all levels of organization and management about how regional collaboration yields efficiencies. Articulate how priorities and effort might shift favorably when these are realized. Identify missions, practices, processes, and authorities that are necessarily jurisdictional or autonomous in order to differentiate these from commonalities and potential synergisms that will benefit from regional collaboration. Collaborative regional tools and practices need to be motivated by mutual benefit, integration of mutually desirable innovations, and efficiencies or technologies of scale.

Use a logical order of operations

Projects must be organized in a deliberate and stepwise order, so that foundational common needs are addressed before dependent processes are initiated. High priority end points may require significant investment in building science foundations (such as consistent classifications) that appear lower priority at the outset. Build a common framework (e.g. Northeast Conservation Framework) and stepwise strategy first, in which order of operations may trump perceived priority.

Define the terminology of common practices

While many organizations have adopted models of adaptive management and planning, the broader discipline of landscape conservation has not yet adopted comprehensive common terminology to describe scientific management and planning. To facilitate communications and synthesis of information, it is essential to establish a common terminology for: kinds or classes of resources managed; threats or factors that impact resources; and actions prescribed to manage resources.

Support for governance and project coordination is essential

Partners may have the desire but not the resources to coordinate effectively without dedicated funding and staff to do so. The LCCs build this governance and support into their structure.

Utilize a third party to overcome funding and administrative barriers

The challenge of pooling resources and funding projects with different annual budget cycles and diverse agency processes can be overcome by a third party that provides the structure and capacity to obligate funds and track projects as is done by WMI for both the RCN and LCC partnerships.

Equalize technological awareness and access

Essential technologies have evolved rapidly: at all levels, it is critical to share access to new technology through websites and training.

Granting and project oversight requires significant capacity

Funding regional scale science and planning projects requires major capacity to steer, adopt and implement. Agency decision makers and program leaders that stand to benefit from their outcomes need a commitment of time to ensure regional outcomes truly benefit contributing jurisdictions, yet the requisite engagement competes with otherwise unrelenting jurisdictional duties. Each project funded would benefit from a corresponding allocation of project funding to support ongoing integration and coordination to ensure meaningful delivery of results.

Good projects have “vertical” support

Projects that are developed with input by technical staff lower in the organizational hierarchy and approved by Agency Directors at the top are more likely to be useful and fit into a larger vision.

Good projects have “horizontal” involvement

Projects need to include involvement across programs, agencies and organizations through oversight teams and demonstration projects in various jurisdictions to help ensure integration and implementation.

**Summary**

Conservation partners in the northeast region of the United States have made significant progress in developing and implementing a conservation business model that utilizes a common adaptive management framework to achieve a shared vision for sustaining natural resources. The development and implementation of State Wildlife Action Plans that share a common regional context will be a critical next step in linking regional priorities to state-level implementation. Other important next steps include the development of a fully functional information management system; greater capacity for science translation, conservation adoption and science delivery; and increased capacity with agencies and organizations forparticipation in landscape scale conservation.**References**

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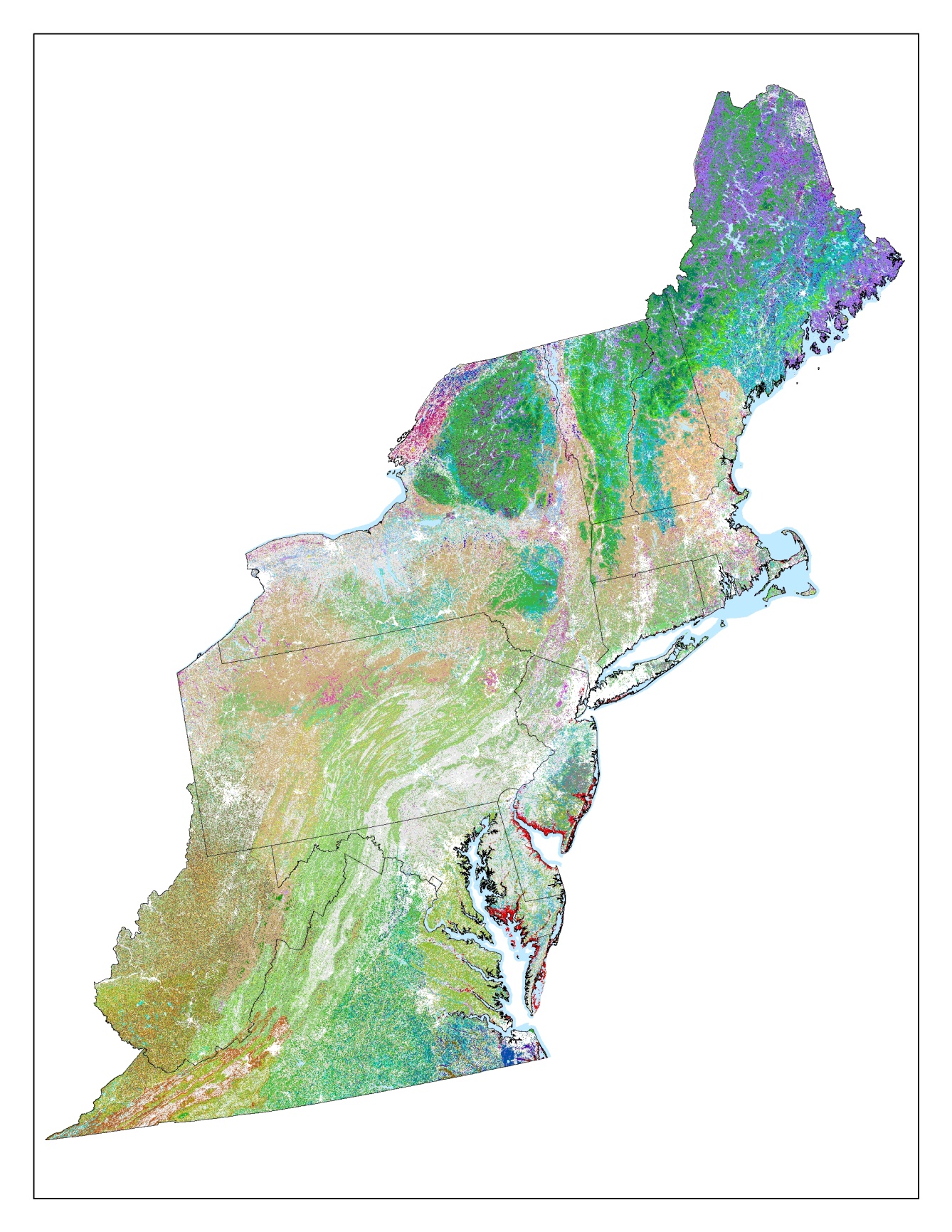


Figure 1. Northeast Terrestrial Habitat map (Gawler et al. 2008; Ferree and Anderson, 2011).

Figure 2. Northeast Conservation Framework. The Northeast Conservation Framework was adopted jointly by NAFWA and NALCC in June, 2011 as a means to organize and evaluate regional conservation projects. The figure incorporates principles of scientific planning and management.

