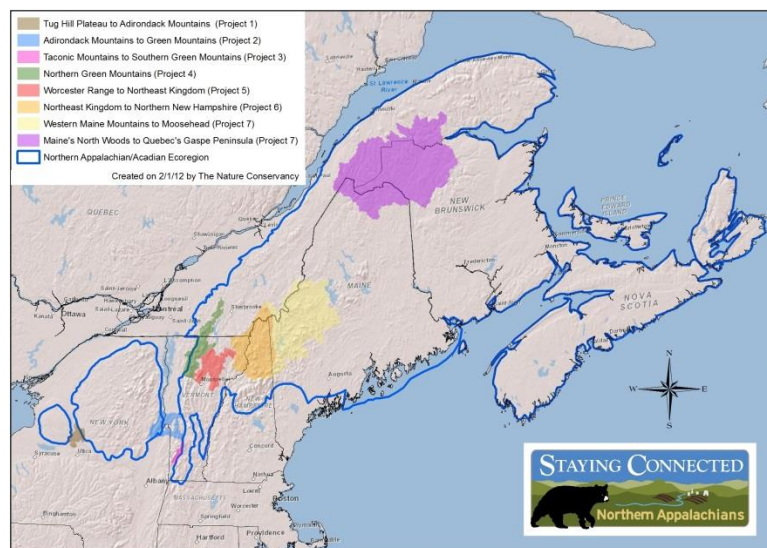




Staying Connected in the Northern Appalachians: Mitigating Fragmentation & Climate Change Impacts on Wildlife Through Functional Habitat Linkages



Final Performance Report – Summary

**Competitive State Wildlife Grant
through State and Federal Assistance Grant U2-4-R**

*Submitted by The Nature Conservancy
on behalf of the
Staying Connected Initiative Partnership*

*Submitted to the New Hampshire Fish & Game Department
and the United States Fish & Wildlife Service*

Reporting Period: May 20, 2009 – February 28, 2013

Date Submitted: May 17, 2013

I. Introduction & Background

This summary distills the work over a nearly four-year period of the many partners involved in the Staying Connected in the Northern Appalachians initiative (the “Staying Connected Initiative” or SCI), supported by a nearly \$1 million Competitive State Wildlife Grant (CSWG) awarded in 2009 and various other funding sources. The work represents an innovative and ambitious collaborative effort to advance landscape-scale conservation across the Northern Appalachian ecoregion, focused on maintaining, enhancing and restoring habitat connectivity for a variety of Species of Greatest Conservation Need in order to mitigate the impacts of habitat fragmentation and climate change.

This document synthesizes the detailed information provided in SCI’s full CSWG Final Performance Report on the Initiative’s activities and accomplishments through the twelve component projects that together formed the scope for the grant. It also provides readers new to SCI with background on the origins and objectives of the Initiative, as well as reflections on its evolution and future directions.

In addition to this summary and the full Final Performance Report itself, the other essential component of our reporting on work to date is the extensive body of supplemental materials provided in the accompanying electronic attachments. They include a range of information that helps to capture the breadth and depth of the SCI partnership’s work, from required CSWG deliverables such as maps and reports prepared as part of the work under individual projects, to detailed documentation of activities, outreach materials, presentations, media coverage, etc.

We also encourage readers to peruse the newly revamped Staying Connected Initiative website at www.stayingconnectedinitiative.org for additional information on SCI’s scope, stories, tools, areas of emphasis, etc.

Context and Need

Geographic/ecologic context

The Northern Appalachian and Acadian region, an area the size of Germany, represents the intersection of the cold boreal areas of Canada with the warmer temperate forests of the eastern United States (Figure 1). The result is a “transition forest,” a rich blend of species from north and south. Its rugged topography, complex river systems, and a long ocean coastline enhance the ecological diversity of the region. This region includes everything from human population centers to large swaths of continuous forests like those in the Adirondacks and northern Maine. It includes landscapes that are highly permeable to wildlife, as well as heavily fragmented areas where a hundred feet of road with small forest patches on either side is a critically important crossing.

While extraordinarily intact compared to other forests of its type across the globe, studies such as Anderson and Sheldon (2011)¹ reveal that this ecoregion risks being separated into a series of ecological islands — thereby isolating populations of a variety of native species of animals and plants and limiting their ability to adapt to a changing climate. To prevent this, conservation of key habitat linkages across the landscape is a critical need. The Wildlife Action Plans of Maine, New Hampshire, Vermont and New York identify a host of wide-ranging and forest-dwelling Species of Greatest Conservation Need (SGCN) such as Canada lynx, American marten, black bear, and bobcat that need to be able to move across the

¹ Anderson, M.G. and A. Olivero Sheldon. 2011. *Conservation Status of Fish, Wildlife, and Natural Habitats in the Northeast Landscape: Implementation of the Northeast Monitoring Framework*. The Nature Conservancy, Eastern Conservation Science. 289 pp.

landscape to meet their life needs. The primary threats to the viability of populations of these species, as identified in each state's Wildlife Action Plan, are land-use related: habitat loss through fragmentation, degradation and conversion, and the impacts of transportation systems.

Conservation Science and Planning

In the 1990s, the conservation community recognized that to protect and restore all elements of nature, from big, wide-ranging predators to plants and aquatic organisms, conservation planning and action must occur at very large geographic scales as well as at smaller ones. In response, The Nature Conservancy (TNC) began carrying out conservation planning within entire ecoregions, and completed its Ecoregional Assessment of the Northern Appalachian/Acadian Ecoregion in 2006 (Anderson et al. 2006). In 2007, Wildlands Network completed a comprehensive conservation strategy, or Wildlands Network Design, for the region to conserve large blocks of core habitat, connect them in functional ways, and accommodate the needs of wide range of species, including large predators (Reining et al. 2007²). In 2008, a bi-national scientific team organized under the umbrella of the nongovernmental entity Two Countries, One Forest (2C1F) helped identify priorities for conservation action in the Northern Appalachian/Acadian region (Trombulak et al. 2008³). This effort identified key areas – “landscape linkages” – critical for maintaining landscape connectivity at the scale of entire region. The Wildlife Action Plans of Maine, New Hampshire, Vermont and New York completed in the mid-2000s also contain numerous recommendations related to the conservation of such linkage habitat for wide-ranging and forest-dwelling SGCN.

While there is a substantial amount of public land in the region, much of the landscape is in private ownership with land use planning and regulation primarily at the local level under state authorization. There are long and closely held traditions of local control, strong private property rights sentiments, and limited appetite for more state or federal land acquisition. Protection of private lands through easements or fee is expensive and funding sources are increasingly limited. Institutions dealing with land use planning are decentralized, relying on local (often volunteer) decision making and requiring providers of technical assistance to engage with many local entities and decision-making processes. While many aspects of transportation planning and management are more centralized at the state/provincial level, local municipalities also play an important role, and implementation and understanding of best practices with regard to wildlife varies considerably across the region at all levels.

The nature and scale of habitat connectivity for wide-ranging species and the societal factors described above combine to create a situation in this region in which no single conservation tool or strategy can adequately sustain a connected landscape. Instead, a multi-faceted, integrated approach is needed that combines several strategies – including (but not necessarily limited to) land protection, land use planning, local engagement, and road barrier mitigation – to address this pressing conservation challenge.

² http://www.wildlandsnetwork.org/sites/default/files/Adirondacks_to_Acadia_08Mar07.pdf

³ Trombulak, S.C., M.G. Anderson, R.F. Baldwin, K. Beazley, J.C. Ray, C. Reining, G. Woolmer, C. Bettigole, G. Forbes, and L. Gratton. 2008. *The Northern Appalachian/Acadian Ecoregion: Priority Locations for Conservation Action*. Two Countries, One Forest Special Report No. 1.

The Staying Connected Partnership

In 2008, a new funding opportunity emerged that was specifically designed to encourage multi-partner, large-scale, cross-boundary projects that implement actions contained in State Wildlife Action Plans – the US Fish & Wildlife Service’s (USFWS) Competitive State Wildlife Grants Program. In response, an unusual 21-member, 4-state partnership of nonprofit conservation organizations, state fish and wildlife agencies, and state transportation agencies came together and submitted an ambitious proposal to advance the conservation, restoration and enhancement of landscape connectivity in the Northern Appalachians (see box). The group recognized that a collaborative approach involving a diverse mix of partners was necessary for making meaningful headway on this conservation challenge at the landscape scale – no one entity could hope to do it all on its own.

Staying Connected Initiative Core Partners for CSWG:

- Maine Audubon
- Maine Department of Inland Fisheries and Wildlife
- Maine Department of Transportation
- National Wildlife Federation
- New Hampshire Audubon
- New Hampshire Department of Transportation
- New Hampshire Fish and Game Department
- New York Department of Transportation
- New York Department of Environmental Conservation
- Northeast Wilderness Trust
- The Nature Conservancy (NY, VT, NH, and ME)
- Trust for Public Land
- Tug Hill Commission
- Tug Hill Tomorrow Land Trust
- Two Countries, One Forest
- Vermont Agency of Transportation
- Vermont Department of Fish and Wildlife
- Vermont Land Trust
- Vermont Natural Resource Council
- Wildlands Network
- Wildlife Conservation Society (Adirondacks)

The partnership’s proposal, *Staying Connected in the Northern Appalachians: Mitigating Fragmentation & Climate Change Impacts on Wildlife through Functional Habitat Linkages*, was one of only nine nationwide that were awarded funding in the first year of the CSWG Program. USFWS awarded the full grant request of nearly \$1 million for the project, and implementation of the Staying Connected Initiative (SCI) began in mid-2009.

The New Hampshire Fish & Game Department (NHF&G) and TNC played central roles in helping to secure and implement SCI’s Competitive SWG. NHF&G served as state agency sponsor of the proposal, and as lead recipient and administrator for the grant. The Nature Conservancy (through its New Hampshire and Vermont Chapters) served as lead sub-grantee, acted as overall project manager, fiscal agent,

and primary contractor, and provided oversight and project management for the initiative as a whole (as well as for many of the individual component projects). TNC drew on its extensive experience managing and administering federal grants to establish a robust system of protocols and practices, guided by seasoned professional project and grant management staff.

While 21 entities have made up the core of the SCI partnership, many other organizations, local governmental bodies, informal groups, and individuals have become involved in the Initiative since 2009.

From the start, the SCI partnership has included representatives from state transportation agencies. There is broad recognition that roads are a one of greatest barriers to movement and threats to wildlife in the region, and thus effective engagement with transportation agencies is essential for addressing the connectivity challenge.

Programmatic Approach

Recognizing that no single conservation strategy would be sufficient for making meaningful headway to effectively maintain, restore and enhance connectivity, we have developed and implemented an integrated, multi-pronged package of approaches. The starting point has been *finer-scale conservation science and planning* to build on earlier regional-scale work (done by 2C1F, Wildlands Network, TNC, and others), identify where the most important places on the ground appear to be for conservation action, and develop targeted implementation plans. That work has then helped to inform the deployment of other place-based conservation and restoration strategies, including *land protection* of parcels that contribute to connectivity values, *technical assistance* for local land use planning and community action, and *road barrier mitigation* focused particularly on priority wildlife crossings that have been identified through scientific modeling and field work.

This suite of approaches has been deployed in eight high priority habitat linkages partly or wholly within the U.S. where landscape connections for wildlife movement are at risk (Figure 1):

1. Tug Hill Plateau to Adirondack Mountains (NY)
2. Adirondack Mountains to Green Mountains (NY-VT)
3. Taconic Mountains to Southern Green Mountains (NY-VT)
4. Northern Green Mountains (VT-QC)
5. Worcester Range to Northeast Kingdom (VT)
6. Northeast Kingdom to Northern New Hampshire
7. Western Maine Mountains (VT-NH-ME)
8. Maine's North Woods to Quebec's Gaspé Peninsula ("3 Borders" region of Maine-New Brunswick-Quebec)⁴

These include top-tier linkages identified by 2C1F and a few others that were determined by SCI partners to also be important for sustaining regional-scale connectivity.

From the outset, SCI partners felt it was critical to tailor our place-based work linkage-by-linkage to meet the unique needs and circumstances in each area based on such factors as land ownership patterns, community receptivity, previously completed work, local partner capacity, etc. The suite of major strategies (conservation science, land protection, technical assistance, road barrier mitigation) has been consistent across all the linkages, but the mix applied in each of these areas has varied in response to the specific context. This is fundamentally different than a "one size fits all" approach to conservation because it allows for flexibility in implementation place to place, which is key to success in this large and highly varied region.

We also believed that progress could best be achieved by complementing place-based work in key linkage areas with selected "cross-cutting strategies" that are not tied to a particular place but would help inform and increase the effectiveness of SCI's place-based work. These are discussed further under *Cross-cutting Objectives* below.

⁴ For the purposes of SCI's Competitive SWG, the two Maine linkages were combined organizationally into one project (Project 7: Maintaining Northwoods Connections – an initiative to conserve landscape permeability along northern Maine borders).

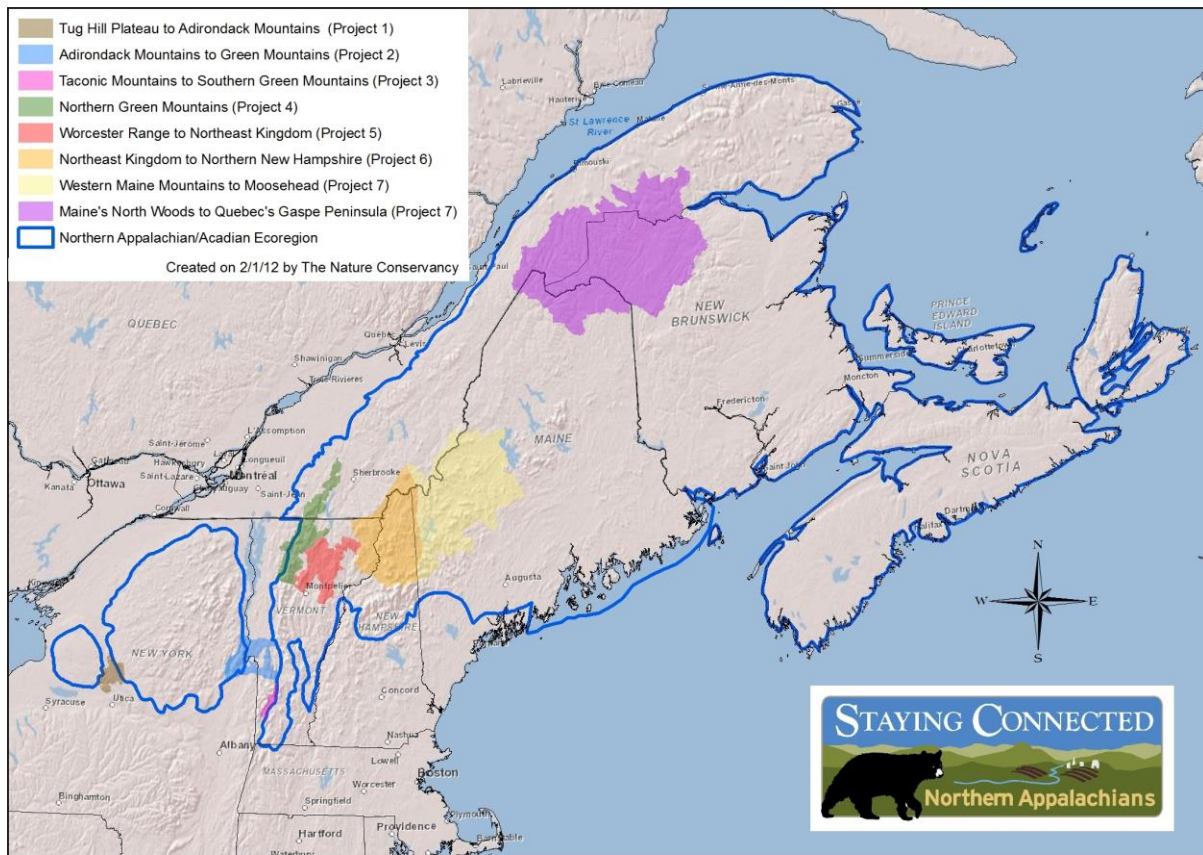


Figure 1. The Northern Appalachian Ecoregion and Priority Linkage Areas for the Staying Connected Initiative's Competitive State Wildlife Grant

Grant Goal and Objectives

The goal of SCI's Competitive State Wildlife Grant and associated work was to maintain, enhance, and restore habitat connectivity for Species of Greatest Conservation Need across the Northern Appalachian Ecoregion in order to mitigate the impacts of habitat fragmentation and climate change. To achieve this goal, the SCI partnership established nine grant objectives that tie to the major place-based and cross-cutting strategies described above under *Programmatic Approach*. These objectives included the following:

Within-Linkage Objectives: The following suite of five objectives were identified for SCI's place-based work in the eight linkage areas, with the specific mix and emphasis tailored to the unique circumstances of each linkage.

1. **Conservation science:** Develop scientific information and analyses at a variety of scales on the ecological features, wildlife movement zones, community conservation values and wildlife road crossing locations within each linkage area necessary to inform and support land protection, land-use and transportation planning, barrier mitigation, and technical assistance to local groups (e.g., planning and conservation commissions, land trusts).
2. **Land protection:** Through the provision of technical assistance and financial assistance for land protection administrative costs, help land trusts protect at least 18,250 acres of important habitat connectivity "stepping stones," at key road crossing segments, and other

high priority areas determined by the ecological assessments and connectivity analyses performed in objective one by the end of the grant period.

3. **Provide technical assistance for local land use planning:** Fifty-six towns within the habitat linkage areas will use land use planning tools, such as incorporating language identifying the importance of habitat protection and connectivity values into conservation sections of town plans, land use planning and zoning ordinances, the development of conservation overlay districts, transfer of development rights programs, house distance zones by the end of the grant period.
4. **Increase the permeability of key roads:** State transportation agencies will incorporate recommended connectivity retention and improvements as part of planned road maintenance/upgrade work planned for 2009-2014 along priority habitat linkage segments identified in objective one.
5. **Provide technical assistance to local organizations:** Improve skills of the local wildlife and community interest groups and stakeholders so they can more effectively support implementation of a broad range of conservation activities related to wildlife and habitat connectivity.

Cross-Cutting Objectives: The four cross-cutting objectives below were intended to help inform and enhance the effectiveness of work on the ground in all of the linkage areas, and to have broader relevance as well.

6. **Develop model easement standards** to ensure habitat connectivity for use by land trusts and public agencies.
7. **Develop technical assistance materials, tools and support systems** to enhance the effectiveness of technical assistance providers and land use planners.
8. **Develop road ecology guidelines and models** to help transportation agencies address connectivity issues.
9. **Host a landscape connectivity conference** in 2011 to share the lessons learned from this grant project and to plan for the ongoing conservation and management of wildlife linkage habitats.

In addition, SCI partners identified important objectives related to **monitoring and evaluation** - specifically, the formation of a Monitoring and Evaluation Group to develop a monitoring framework to track the status of landscape connectivity in the Northern Appalachians and the impact of associated conservation efforts over time. The framework should have an efficient and meaningful set of measures that can be reported in a manner understandable to partners, key stakeholders, and the broader public.

The partnership also established important objectives related to **project management**, including (1) ensuring sound and efficient financial management of grant funds, (2) ensuring the completion and timely submittal of all grant requirements and deliverables, and (3) fostering efficient, climate-friendly coordination and communication among project partners to optimize implementation of grant components, collective learning from these efforts, and opportunities for leveraging new support for future work.

II. Accomplishments

Following is a summary by grant objective of the accomplishments achieved by the SCI partnership during the CSWG grant period. This includes results achieved both with CSWG funds and formally recorded match, and with additional resources leveraged but not counted as match. The individual project reports in the full Final Performance Report provide further information on which aspects were accomplished with CSWG and matching funds, and which did not involve any of those funds.

Within-Linkage Objectives: The accomplishments presented below for the five within-linkage objectives represent a distilled summary for each of those strategies across the seven linkage projects involved in this grant.

1. Conservation science:

- GIS modeling and conservation planning using a variety of cutting edge approaches tailored to the specific context of each linkage has been completed for all seven SCI linkage areas. Many of the products from these efforts are included in the linkage-specific attachments to the Final Performance Report (folders for Projects 1-7).
- Key SCI partners for each linkage have been involved in this work in various ways, fostering their buy-in to the final outputs and their use of the products to inform their priorities and investments for conservation action. Also, SCI partners are judiciously sharing the products from these modeling and planning exercises with other entities and stakeholders to concentrate conservation action on areas identified as high priority for connectivity.
- SCI partners have developed a common way to interpret the results of linkage-specific modeling exercises, and the partnership now has a unified spatial dataset encompassing SCI priority areas for conservation across the seven linkages.

2. Land protection:

- SCI partner land trusts – including The Nature Conservancy, Trust for Public Land, Tug Hill Tomorrow Land Trust, and Vermont Land Trust – conducted extensive outreach and technical assistance to landowners and public conservation agencies to advance land protection projects on priority parcels that contribute to connectivity values in the seven SCI linkage areas.
- During the effective period of the grant, these land trusts **completed a total of 79 permanent land protection projects** involving fee and easement acquisitions on **more than 288,000 acres** that contribute to connectivity values (and other conservation goals) in the linkage areas. This includes 5,473 acres closed in New York, 18,722 acres in Vermont, 9,815 acres in New Hampshire, and 254,339 acres in Maine.
- **Forty-two of the completed projects, totaling 18,563 acres, involved use of Competitive State Wildlife Grant funds and/or formally recorded match** by TNC, TPL, THTLT, and VLT. **These are the projects that are formally counted toward the stated grant objective of 18,250 acres.** They include 5,079 acres from projects in New York, and 13,484 acres from projects in Vermont. The required supplemental documentation for these projects in accordance with guidance from the New Hampshire Fish & Game Department and US Fish and Wildlife Service is provided in the “Land Protection” folder of the attachments to the Final Performance Report (see sub-folder “Supplemental Documentation for SWG & Match Projects”).

- **Ten projects covering more than 43,000 additional acres of important lands for connectivity are pending**, with closings anticipated in the next 1-18 months. This includes 2,026 acres pending in New York, 119 acres in Vermont, 23,083 acres in New Hampshire, and 17,844 acres in Maine.
- The “Land Protection” folder of the attachments includes a table with summary information on all completed and pending projects (see file “SCI Land Protection Projects Overall (rev final)”), along with linkage-by-linkage maps showing the locations of all projects. Further information on completed and pending projects is also provided in the linkage-specific reports for CSWG Projects 1-7 in the Final Performance Report.
- A multi-linkage/statewide effort by SCI partners in Vermont has institutionalized connectivity criteria into the evaluation of parcels and projects for funding through USDA NRCS Farm Bill conservation cost-share programs. SCI partners worked with NRCS to develop ranking criteria and provided a spatial dataset to support project evaluation that gives greater weight to those that benefit landscape connectivity.

3. **Provide technical assistance for local land use planning:**

- Several SCI partners (Tug Hill Commission, WCS-Adirondacks, Vermont Fish and Wildlife Department, Vermont Natural Resources Council, The Nature Conservancy, Wildlands Network, National Wildlife Federation, etc.) and contracted technical assistance coordinators worked with many communities in the Tug Hill-Adirondacks, Adirondacks-Greens, Northern Green Mountains, and Worcester-Northeast Kingdom linkages of New York and Vermont. Targeted assistance activities included meetings with municipal boards, public forums, and individual stakeholder meetings. During the grant period, outreach, presentations, and other technical assistance on connectivity and local land use planning were undertaken in **at least 41 communities** within these linkage areas (7 in New York, 34 in Vermont).
- Technical assistance on connectivity and municipal planning also has been undertaken with **six of the 11 regional planning commissions (RPCs) in Vermont and one regional commission in New York**. Together, these seven RPCs provide technical assistance to **88 municipalities within SCI linkage areas**, as well as dozens more outside those boundaries that play an integral part in the overall landscape context of the Northern Appalachian region.
- Since RPCs are responsible for technical assistance to all municipalities in their service area, providing technical assistance to them has dramatically increased our efficiency and breadth of delivery at the local level. In addition, part of SCI’s technical assistance to the RPCs has been designed to encourage and enable them to incorporate connectivity provisions into their regional plans. These plans provide important guidance to municipalities for their own local plans, and incentives may be available to towns whose local plans include consistent provisions with those of the applicable regional plan. This is another important way in which SCI has sought to extend the reach of its land use planning technical assistance. Weaving together this RPC-oriented approach with direct technical assistance to individual municipalities was a strategic decision on the part of SCI partners during the grant period to enhance the effectiveness of our work and make best use of limited capacity and resources.
- This combination of technical assistance provided by SCI partners to individual towns and RPCs contributed directly to the following **municipal and regional actions in the linkages during the grant period**:

- Thirteen towns have added connectivity provisions to their town plans and five others are now working to do so;
- Six towns are currently working on revisions to their zoning and subdivision bylaws/regulations to address habitat and connectivity priorities;
- One RPC has incorporated connectivity provisions in its regional plan (which covers 19 linkage area towns and eight others outside the linkage boundary), and three other RPCs are now working to do so (covering dozens of additional linkage area towns);
- Two towns have established new Conservation Commissions;
- One town established a new town Conservation Fund.
- Additional information on the specifics of these efforts and accomplishments is provided in the table entitled “Summary of Staying Connected Initiative Land Use Planning Technical Assistance to Towns and Regional Planning Commissions” in the “Land Use Planning” folder of the attachments to the Final Performance Report.

4. **Increase the permeability of key roads:**

- As part of SCI’s conservation science and planning work, priority road segments for connectivity have been identified in all linkage areas.
- Wildlife tracking along key road stretches has been conducted in most of the linkages, although with varying success due to poor tracking conditions during the winter of 2011-12 resulting from a lack of snowfall.
- Technical assistance and data on priority road segments has been shared with state transportation agencies in New York, Vermont, New Hampshire, and Maine.
- Several Vermont-based Staying Connected partners were lead participants in a collaboration with the VT Agency of Transportation to develop a statewide *Transportation and Habitat Connectivity Guidance Document* to inform road corridor planning, project design, and operational practices.
- TNC-Adirondacks is working with the NY Department of Transportation to develop a model based on remotely sensed data (e.g., satellite images and orthophotos) that can be used for rapid assessment of extensive sections of road, to predict areas of high wildlife movement.
- Within the Tug Hill-Adirondacks linkage, TNC-Adirondacks worked with NYSDOT and two local highway departments to identify potential mitigation projects that would enhance successful movement of wildlife across roads. TNC awaits approval from DOT engineers to install a ‘critter walk’ (wildlife shelf) at a key crossing area on Route 12/22, the major road barrier to animal movement in the Black River Valley. TNC has secured additional funding to work with one town to up-size a culvert to enhance connectivity at a location considered a priority for maintenance/road repair.
- SCI partner Vermont Fish & Wildlife Department provided trainings on basic concepts in habitat connectivity and applied transportation uses for this information to several divisions within VTrans, including Structures, Roadway Management, and the Environmental Section. This work helps VTrans staff to follow internal procedures that result in identifying important connectivity areas.
- SCI partner TNC-Vermont was able to get spatially explicit connectivity conservation values incorporated into a VTrans road corridor improvement scoping document for improving/widening state Route 22A in the Adirondacks-Greens linkage.

- Road barrier monitoring and evaluation metrics have been incorporated into the SCI monitoring framework (see summary later in this section and the Project 11 report in the Final Performance Report), and include traffic volume, land cover types along road segments, the degree of permeability of a road structure (culverts, bridges), and amount of conserved land near a road segment. Baseline data have not been collected for all road segments and for all metrics, but there is consensus around these measures and data will continue to be collected and shared under the umbrella of the monitoring framework.
 - SCI partners have highlighted the initiative and this body of road-related work in presentations at the last two biennial Northeast Transportation and Wildlife Conferences.
5. **Provide technical assistance to local organizations:** As for Objective 3 above, technical assistance to local organizations was concentrated in the Adirondacks-Tug Hill, Adirondacks-Green Mountains, Northern Green Mountains, and Worcesters-Northeast Kingdom linkages.
- In the **Adirondacks-Tug Hill** linkage, SCI partners developed a technical handbook for planners called “Make Room for Wildlife: a guide for planners in the Tug Hill”. This resource lays out options for appropriate development that minimizes the impact to wildlife. The information was presented to dozens of communities in the linkage at a Local Government Conference in April 2011. In December, 2010, we convened representatives and residents of three top priority communities – the Towns of Western, Ava, and Steuben – for a “Community Values Mapping” workshop. The goal of the workshop was to identify places in the local landscape that are valued by residents of the towns for various reasons (wildlife habitat, recreation, forest products, aesthetics, “sense of place”, etc.). The results of this gathering are being used by the communities to inform local land use planning and help justify maintaining natural areas within the linkage for the benefits they provide to both people and wildlife. (The products from these efforts are included in the Project 1 folder of the attachments to the Final Performance Report.)
 - In the **Adirondacks-Green Mountains** linkage, SCI organized nearly 60 events (presentations, walks, meetings) attended by more than 1,000 people over 3 years. These events focused on fostering a sense of enthusiasm and interest in habitat connectivity in critical linkage geographies, building local knowledge and understanding of various approaches to connectivity conservation, and helping SCI partners identify specific opportunities to form and support local groups interested in connectivity conservation. Three groups were identified as having particular potential to achieve connectivity conservation gains in critical locations and, hence were provided with enhanced engagement/support. Overall, assistance on habitat connectivity was specifically provided to 16 non-governmental groups in the Vermont portion of the linkage. SCI partners also organized a cross-border stakeholder meeting (referred to as “A Place in Between”) with approximately 30 participants (individuals and organizations) from NY and VT. A summary report was developed and shared with participants that synthesizes meeting results, provides maps illustrating where stakeholders are engaged in conservation work, and identifies gaps, opportunities for collaboration, and conservation needs. (A copy of this publication is included in the Project 2 folder of the attachments.) Since this meeting, four participating organizations have reported that they now include a new message about wildlife connectivity in their outreach efforts to landowners and municipalities.
 - Extensive assistance and outreach to local groups also occurred in the **Northern Green Mountains** linkage. One particular area of focus for Staying Connected partners and technical assistance coordinators has been in supporting and developing the efforts of the

grassroots Cold Hollow-to-Canada Forest Link Project. This community-based partnership is working across seven adjacent towns in northern Vermont, emphasizing land stewardship and wildlife habitat conservation. Staying Connected has supported this multi-town partnership by providing technical assistance, helping to fund and establish a citizen-based wildlife tracking effort, and securing funds to bring in the Vermont Natural Resources Council to provide town planning expertise to communities in the project area. (The most recent CHC newsletter is included in the Project 4 folder of the attachments; also see www.coldhollowtocanada.org and <http://coldhollowtocanada.org/tracking-wildlife-in-the-northern-greens/> for further information.)

- In the **Worcesters-Northeast Kingdom** linkage in Vermont, significant outreach to local organizations took place. For example, technical assistance was provided to two local land trusts (Northern Rivers Land Trust and Greensboro Land Trust) in addition to the Vermont Land Trust, a statewide SCI partner. All three of these important land trust partners have incorporated connectivity into their assessment and planning for projects. SCI's local technical assistance coordinator also organized many wildlife-related events, from guided walks to a "Deer of North America" presentation that provided an opportunity to network with local fish and game clubs and other hunting-oriented organizations about shared landscape values. Further, production of "An Enduring Place", a publication exploring connections between the region's ecology and people and designed to help solidify the linkage's identity and "brand", has provided a valuable new platform for advancing connectivity efforts with a wide assortment of local organizations. (A copy of this publication is included in the attachments.) SCI also has established a partnership with the Craftsbury Outdoor Center, and this organization will serve as a local "hub" of habitat connectivity advocacy in the linkage moving forward.
- More limited technical assistance to local organizations also was provided in other linkages – for instance, to the Battenkill Conservation Group, a local conservation organization in the Greens-Taconics linkage; and to the Mahoosucs Land Trust in the western Maine Linkage, where SCI partners provided GIS data related to forest blocks and potential connectivity areas.

Cross-Cutting Objectives: SCI's accomplishments on the suite of cross-cutting objectives below have helped to inform and augment the partnership's work on the ground in the linkage areas, and have broader relevance and applicability to similar conservation efforts elsewhere as well.

6. **Develop model easement standards** to ensure habitat connectivity for use by land trusts and public agencies.
 - We completed the development and distribution of a set of annotated conservation easement terms and provisions relevant to wildlife habitat connectivity. We began by conducting a literature review and outreach to partners for existing examples. We expected there would be at least some to serve as a starting point, but our research yielded few concrete examples of easement language directed at connectivity or other written guidance. Therefore, we relied primarily on the expertise and ideas of select SCI land trust staff in drafting model easement provisions. We then circulated the draft terms and provisions for a broader review within the SCI partnership and to others in the conservation community, and refined them based on the input we received. The final product of this effort – *Potential Conservation Easement Provisions Designed to Explicitly Address Connectivity in the Northern Appalachians* – is included in the Project 8 folder of the attachments. Rather than providing a completely new easement template, these provisions are intended to be

additive to standard conservation easement language that is typically used by land trusts in the northeastern U.S.

7. **Develop technical assistance materials, tools and support systems** to enhance the effectiveness of technical assistance providers and land use planners.
 - After learning part-way into its work on this land use planning cross-cutting objective of a similar effort being conducted outside the Staying Connected partnership, project lead WCS-Adirondacks adjusted the focus of the effort in consultation with SCI leadership and other partners. The reframed effort focused on researching existing municipal land use planning regulations across the four SCI states and assessing the strength of development restrictions and conservation requirements that are currently in place. WCS identified those regulations that seem to have the most benefits to wildlife connectivity, highlighted particularly good examples, and distributed this information to planners and municipalities across the region to encourage local incorporation of best practices. WCS's final report *Protecting Wildlife Connectivity through Land Use Planning: Best Management Practices and the Role of Conservation Development* is included in the project 9 folder of the attachments.
 - The Vermont Natural Resources Council is in the final stages of preparing a manual for land use planners, conservation commissions and local and regional planning commissions to reduce forest fragmentation and maintain productive blocks of forestland and enhance connectivity. The manual explains land use policies and provides model language for town plans and zoning and subdivision regulations that can be incorporated into the local and regional planning process. The manual also outlines non-regulatory approaches that can be implemented through the planning process. A sample draft chapter of VNRC's forthcoming manual is included in the project 9 folder of the attachments.
8. **Develop road ecology guidelines and models** to help transportation agencies address connectivity issues:
 - Through a literature review and consultation with experts in the field, project lead TNC-Adirondacks directed the development of a detailed database of references on connectivity and transportation, and produced and distributed an accompanying summary report entitled *Road Maintenance and Planning for Terrestrial Connectivity – Best Practices*. The report and database are organized around major themes, including modeling tools and priority-setting, barrier mitigation approaches/taking action, field validation and monitoring effectiveness, and staying current. Both of these documents are included in the project 10 folder of the attachments.
 - As mentioned under Objective 4 above, several SCI partners in Vermont were deeply involved in a collaboration with the VT Agency of Transportation to develop statewide transportation Best Management Practices for wildlife to inform road corridor planning, project design, and operational practices. Data from SCI activities, including mapping of structural pathways and associated priority road segments, were shared with the technical committee. A copy of the final product from this effort – entitled *Vermont Transportation & Habitat Connectivity Guidance Document* – is included in the project 10 folder of the attachments.

9. **Host a landscape connectivity conference** in 2011 to share the lessons learned from this grant project and to plan for the ongoing conservation and management of wildlife linkage habitats:
 - A working group, led by the Wildlands Network, organized and facilitated a workshop/“retreat” for SCI partners and other key players on February 14-15, 2012. About 50 federal, state, and NGO partners from the northeastern U.S. and Canada attended. At the retreat, Staying Connected linkage and cross-cutting project leaders gave a series of brief presentations summarizing work to date, and participants engaged in plenary and break-out discussions to review best practices and lessons learned, identify important next steps in our individual and collective work, and deliberate on how the Staying Connected collaborative could continue under various funding and operating scenarios. Important conclusions included:
 - Improve/increase cross-border collaboration, both with Canada and among states and provinces;
 - Enhance internal and external communications;
 - Refine long-term goals, objectives, and strategies;
 - Step up SCI engagement on transportation issues;
 - Refine the governance structure of the initiative.
 - The working group prepared and distributed a report summarizing key aspects of the workshop to all participants and others in the SCI network. That document is included in the Project 11 folder of the attachments. It has provided an important foundation for ongoing discussions about the future of the initiative.

Monitoring and Evaluation

Led by Wildlands Network and The Nature Conservancy, the SCI Monitoring and Evaluation Group developed a detailed and innovative framework for tracking the status of landscape connectivity and associated conservation efforts in the Northern Appalachians over time. The framework provides a compact set of relatively simple, inexpensive, and repeatable GIS-based status measures, as well as an initial snapshot of the current status of structural connectivity (with baseline numbers and maps) for each SCI linkage area and the important *pathways* – fine-scale landscape connections – they contain.

There are four sets of connectivity measures for each linkage: two relate to habitat composition and distribution, and derive from land use-land cover data; one describes the state of land protection and is derived from regional datasets maintained by TNC; and one attempts to describe the status of existing road-barrier effects and is derived from road lengths and traffic volume counts. Because of gaps in appropriate data needed for some indicators, not all proposed status measures were run. In addition, because of our lack of knowledge of *thresholds* for structural connectivity in the northeast, specific objectives are not articulated for all measures.

The final report of this effort, entitled *A Measures Framework for Staying Connected in the Northern Appalachians* – is included in the Project 11 folder of the attachments.

Project Management

Led by TNC, the partnership established an effective structure for managing the many components of the initiative across the wide geography of the four SCI states, ensuring sound financial management and completion of required reporting and deliverables, and fostering collaboration, shared learning, and leveraging of additional resources to advance connectivity work. Key elements included:

- seasoned TNC staff serving as overall project manager and grants specialist;
- dedicated project leaders for each of the linkages and cross-cutting strategies;
- a 4-state steering committee comprised of the overall project manager, the individual project leaders and other key partner staff that convened monthly;
- a Vermont-specific steering committee that convened quarterly to help guide the concentration of SCI-related work in the state;
- a smaller working group of Vermont partners that focused particularly on the extensive local technical assistance work that was conducted in several in-state linkages;
- discrete project teams comprised of key partners for each linkage and cross-cutting strategy that convened as needed;
- a funding committee that convened periodically to assess potential funding opportunities and coordinate the development of proposals for top prospects.

The partnership supplemented this structure with tools to further enable effective, efficient, and climate-friendly coordination and collaboration. These included extensive use of conference calls, “virtual” meetings, and email; judicious use of in-person meetings; a password-protected, web-based platform for project management, document storage, and internal communications; two listservs to facilitate communication and sharing of information within the partnership; and the development of an SCI website (see below under “Visibility”).

The effectiveness of SCI’s approach to project management for this complex large-scale initiative is reflected in the accomplishments described in this Summary and the full Final Performance Report.

Visibility

In addition to the accomplishments described above that relate to specific grant objectives, we have made important progress in building an identity and visibility for the Staying Connected Initiative as an innovative approach to addressing the landscape-scale challenge of habitat connectivity conservation in the Northern Appalachians. Noteworthy aspects of this progress include the following:

- The Staying Connected logo (see cover of this report, and tailored to each of the linkages) and other branding materials have been distributed among SCI partners and widely used in publications, outreach materials, and presentations. This has been an important and effective tool for helping to create an immediately recognizable identity and associated credibility for the Initiative among a variety of audiences.
- The newly revamped and enhanced SCI website (www.stayingconnectedinitiative.org) has provided the partnership with an essential tool for success in the current context – giving the Initiative an attractive, informative presence on the Web, serving as an important way of sharing information and the “SCI story” both within the partnership and with external audiences, and helping to solidify the Initiative’s brand, substance, accomplishments, and relevance for stakeholders, potential new partners, funders, the media, etc.
- SCI has received some favorable coverage in local and regional media (print and radio), which has helped to broaden awareness of the work and the importance of issue of habitat connectivity. A few examples of this coverage are included in some of the linkage project folders and the “SCI General” folder of the attachments to this report. A flurry of additional coverage in New York, Maine and New Hampshire occurred early this spring, just after the end of the CSWG effective period.

- SCI partners have conducted targeted outreach, presentations, and relationship-building with key conservation audiences and networks outside the immediate partnership, such as the North Atlantic Landscape Conservation Cooperative, Northeast Association of Fish and Wildlife Agencies, Northeast Transportation and Wildlife Conference, Wildlands and Woodlands Partnership, Land Trust Alliance, New England Society of American Foresters, and others. (Examples of presentations developed for some of these audiences and opportunities are included in the “SCI General” folder of the attachments.) As a result of these efforts, awareness and understanding of the Initiative have grown considerably. SCI is recognized as an important new example of collaborative landscape-scale conservation in the Northeast.

In summary, the SCI partnership met or exceeded grant objectives in all aspects of the project. Great strides were made in conservation science, land protection, land-use planning, organizational strengthening, and improving road permeability. All of this took place across four states and demanded the close collaboration of a wide range of public and private organizations. Organizations gained experience working in a collaborative fashion and the relationships established and nurtured during the project will pay dividends for years to come. Work unfolded as envisioned in many cases, and – as is to be expected in an initiative of this scale, duration, and complexity – somewhat differently in others due to unforeseen opportunities, challenges, circumstances, learning, etc. Nevertheless, the overarching results are positive and long lasting.

III. Financial Overview

Following is a summary of key aspects of the financial management picture for SCI’s Competitive SWG and related considerations:

- **CSWG and Match Funds:** The full \$977,992 of Competitive SWG funds sub-granted to The Nature Conservancy by New Hampshire Fish & Game Department has been expended, and the required match total of \$715,219 has been exceeded by \$42,078 or 5.9% (\$757,297 total). All grant and matching funds have been carefully tracked to ensure that they have been used only for eligible purposes, have supported the completion of required deliverables, and have been appropriately documented.
- **Leverage:** Beyond the formally recorded match total above, SCI partners secured and expended substantial additional funds from many public and private sources for other operational costs and capital expenses (particularly for land protection projects) associated with grant-related work. Given the number of organizations, projects, and funding sources involved, a reliable cumulative tally of these additional funds leveraged would be very difficult to develop. But with capital expenses included, the ***total undoubtedly would be many millions of dollars.***
- **Sub-awards and Contracts:** TNC developed and carefully managed 3 major sub-awards and 9 significant contracts with SCI non-profit partners across four states, along with several other contracts for services with private firms and individuals. These agreements involved more than \$527,000 of SWG funds and more than \$491,000 of matching funds (including in-kind contributions). All of these agreements came in at or under budget, in many cases were a source of considerably more match than originally anticipated, and were key vehicles for delivering significant results (both required deliverables and additional important accomplishments).
- **Budget Management:** TNC’s overall project manager and grants specialist worked closely throughout the grant period with the project managers for the individual component projects and at an overarching level to track expenditure of CSWG funds and accumulation of eligible match relative to original and adjusted budgets. As is to be expected with an undertaking of this

magnitude, complexity, and duration, actual expenditures and accumulation of match for particular budget categories and projects varied somewhat from those budgets. But these variations were all well within established requirements (e.g., no more than 10% of total grant amount deviation from budget for expenditures in any budget category without prior approval). And at the overarching/grant-wide level, the total package of work was completed on budget for CSWG funds with nearly 6% excess match.

- **Fundraising:** Under the leadership of the 4-state Steering Committee and the funding committee, SCI partners collaborated actively throughout the grant period to secure funds from public and private sources to help advance the partnership's multi-pronged work. These efforts have resulted in nearly \$400,000 in private grants, from the Wildlife Conservation Society's Wildlife Action Opportunities Fund and Jessie B. Cox Charitable Trust. This funding has been critical in helping to support grant-related work, meet the partnership's match commitment for the Competitive SWG, and position it to continue some key elements of collaborative work in the beginning of phase 2. Unfortunately other joint proposals – most notably a second CSWG proposal submitted in 2012 – have not been successful. The partnership continues to actively pursue opportunities to secure a comparable base of operational funding for a multi-faceted package of place-based and cross-cutting work that the 2009 CSWG has enabled.⁵

IV. Looking Ahead

SCI core partners are strongly committed to continuing collaborative work on connectivity conservation in the Northern Appalachians. It is clear from the measures data and maps developed by the SCI Monitoring and Evaluation Group that there is much conservation and restoration work to be done to ensure that the linkages remain viable for the long-term. And we feel it is essential to build on the investments that have been made in recent years and the momentum, experience, and strong working relationships that have been established.

Continuing the energy and forward-looking thinking from SCI's retreat in February, 2012, a nucleus of core partners and other colleagues met late last year to outline a next phase of this work. In addition to partners from the four core U.S. states, representatives from neighboring provinces in Canada and Massachusetts attended. There was a strong consensus that SCI should move to a more fully bi-national/ecoregional approach to connectivity conservation across the Northern Appalachian/Acadian region, and look at important adjoining forested connections that extend beyond the ecoregional boundaries and contribute to a broader picture of landscape connectivity. To this end, the group agreed that the SCI Steering Committee and other working committees should be expanded appropriately to bring in Canadian and Massachusetts representation, and work should be more fully integrated across the US/Canadian border.

The SCI partnership hopes to continue work in the current set of linkages, and potentially expand to other priority locales. The Chignecto Isthmus connecting New Brunswick and Nova Scotia is one example of where this expansion is envisioned. It is also possible that linkages in Massachusetts could be added. In addition, there is general agreement that going forward the Northeast Kingdom to Northern New

⁵ Note that the fundraising activities described were carried out without the use of CSWG or recorded match funds. Also, the partnership's collaborative fundraising efforts were in addition to the substantial work done by SCI partners individually to secure funding from various sources to support other parts of their own operational and/or capital needs for connectivity-related work.

Hampshire linkage and the Western Maine Mountains linkage should be considered as a single large linkage rather than two separate ones as has been the case thus far. (See Figure 2.)

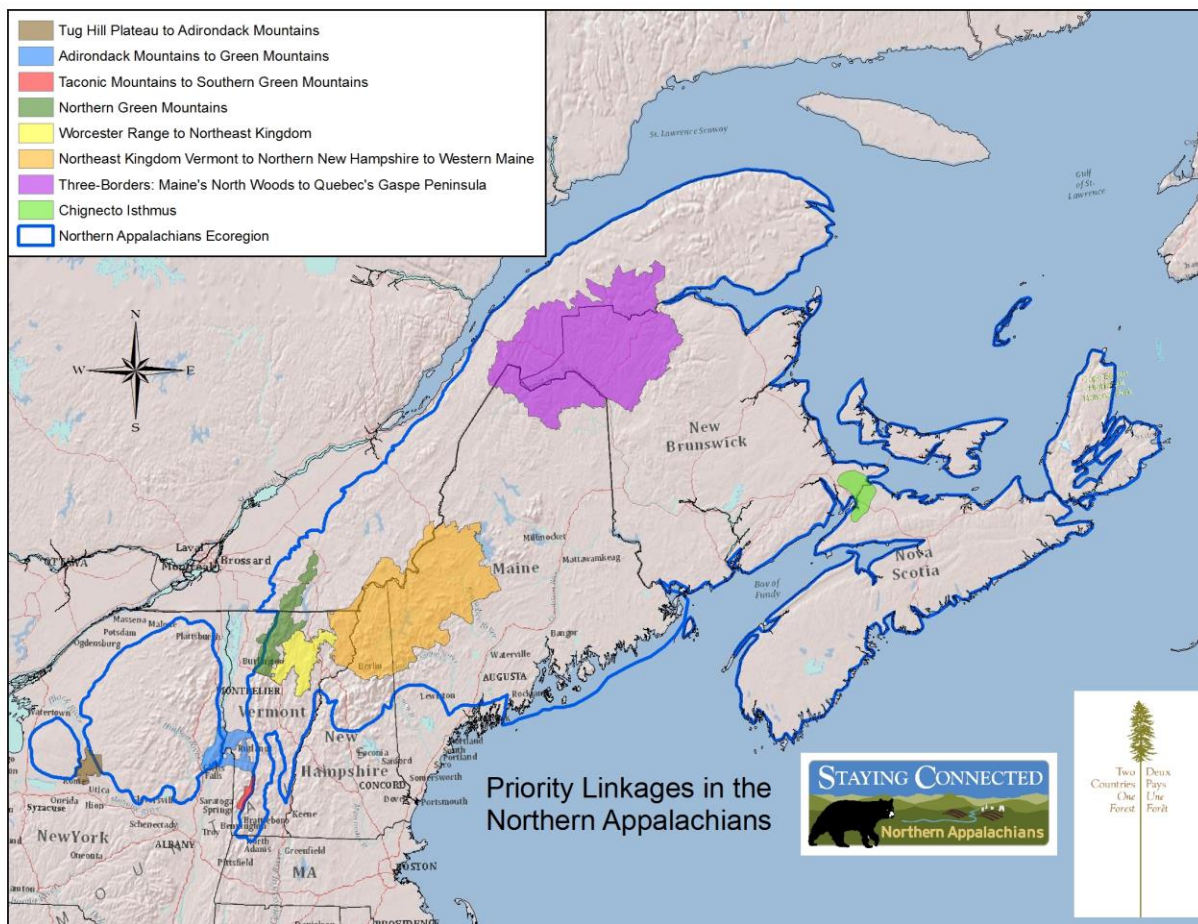


Figure 2. Priority Linkages in the Northern Appalachians at the Start of the Second Phase of the Staying Connected Initiative.

One of SCI's hallmarks thus far has been its successful blending of private, non-profit conservation entities with public natural resource and transportation agencies at the state level. There is consensus that this approach should continue, and hopefully expand to include provincial and Federal involvement, particularly in the transportation realm.

Efforts to identify and build relationships with local leaders who can help drive community action should be stepped up. Partners also recognize the need to engage a broader range of collaborators in some if not all of the linkages, such as those from recreation, hunting/fishing, and economic development interests.

SCI land trust partners have made significant headway in advancing land protection that helps to secure connected habitat, and that work should continue with further integration of priority areas identified through conservation science and planning work conducted during Phase 1. Functional connectivity research should provide further insights into land protection priorities.

There are also at least three thematic strategies that the partnership sees as priorities for near-term action. The first, which involves assessing the actual or “functional” connectivity of the linkages, is really the next step in monitoring and evaluation. Phase 1 established an important framework and baseline for monitoring landscape conditions for connectivity based on remote data, but it doesn’t provide information on whether or how readily wildlife are actually able to move within the linkages. Using wildlife cameras, citizen science, professional tracking, and other techniques, we can validate presence and movement of focal species. By developing a coordinated framework, centralized database, and standardized methods for data collection throughout the region, all jurisdictions can share data and get a clearer picture of the true state of landscape connectivity over time.

Second, the partnership recognizes a clear need to further institutionalize policies, programs, and capacity that benefit connectivity in governmental agencies at the state, provincial and federal levels. To this end, SCI partners anticipate forming a policy committee that will develop and implement a strategy to engage agency leaders, as well as the New England Governors and Eastern Canadian Premiers. There are also policy-related opportunities to address connectivity in upcoming revisions to state Wildlife Action Plans and state Forestry Action Plans.

The third key thematic strategy involves expanding the adoption and implementation of transportation best management practices (BMPs) addressing wildlife-road conflicts and habitat connectivity. Efforts to build on recent progress with state transportation partners need to continue. The next step is to expand the dialogue, exchange of ideas, and training across the region to continue raising awareness and action on wildlife movement and habitat connectivity issues. SCI partners can help to ensure that DOTs in the states, provinces, and municipalities are using BMPs more consistently, and to establish pilot or proof-of-concept projects in the linkages.

The partnership has also learned the importance of communications. The last few years have been primarily focused on getting the initiative underway, and only now is the message beginning to get out more broadly – as evidenced by notable media coverage in several of the states in the last few months. With tangible accomplishments under our belt, good stories about wildlife and people to tell, and a new website in place, we hope to attract broader media coverage and reach new audiences. As we move forward, we recognize a need for capacity to maintain communications with a range of audiences.

And securing further funding to enable a robust Phase 2 of SCI’s work is a top ongoing priority. The goal is to attract sufficient core operational funding to support the continuation of the multi-faceted approach that has made SCI an innovative and effective means of delivering tangible conservation at the landscape scale, and to sustain the partnership coordination and other functions such as communications that are essential to its success. Under the leadership of the SCI funding committee, the partnership continues to assess and actively pursue potential opportunities for such support from a range of public and private sources.

V. Conclusion

With the combination of significant accomplishments, development of an effective and complementary partnership network, and learning from the past 4 years; strong commitment and energy among partners; some modest new funding; and focused attention in recent months, the Staying Connected partnership is now forging ahead Phase 2 of the Initiative. We look forward to building on the strong foundation established thus far in advancing the important work of sustaining landscape connections in the Northern Appalachians and adjoining areas for the benefit of wildlife and people.

It is hard to overstate the importance of the Competitive SWG funding in enabling the Staying Connected Initiative to get to this point and accomplish all that it has. Not only was the funding substantial enough to implement an ambitious landscape-scale project, but the availability of a centralized source of significant operating funds also fostered a level of collaboration and coordination across organizations, states and strategies that would have been difficult if not impossible to achieve otherwise. The prominence and magnitude of the Competitive SWG funds also helped to enable the partnership to secure other sizable operating grants, and to leverage substantial in-kind contributions. All of these things – the ability to move forward with a multi-faceted package of conservation work, support effective collaboration among a widespread partnership network, and attract funding from a diversity of sources – have reinforced each other and yielded a result that is genuinely greater than the sum of its parts. This whole body of work would not have been possible to anywhere near the degree that it was without the Competitive SWG.