

## WCS Climate Adaptation Fund 2015



### Section I. APPLICATION COVER PAGE

#### Organization Information

Organization name: Trout Unlimited, Inc.

Address: 1777 N Kent St, Suite 100

City: Arlington

State: VA

Zip: 22209-2133

Organization EIN (Employer Identification Number): 38-1612715

Executive Director: Chris Wood

Project Director: Colin Lawson

Title: New England Culvert Project Coordinator

Telephone: 603-228-2200

E-mail address: clawson@tu.org

Web address: www.tu.org

Alternate contact (name, email, phone): Erin Rodgers, erodgers@tu.org, 603-852-8110

Organizational budget this year: \$ 41,489,691

Provide a summary of your organization's history, goals and current objectives (no more than 2 lines):

Trout Unlimited is a fisheries conservation non-profit organization created by a group of local fishermen in Michigan in 1959. It is now nationally recognized with over 150,000 members whose mission is to conserve, protect, and restore North America's coldwater fisheries and their watersheds.

#### Project Information

Project Title: **Building Capacity on the North River: A multi-system approach to improve adaptive capacity of riparian areas and cold water streams vulnerable to projected climate change**

Amount requested: \$ 249,943

Project budget: \$ 679,527

Project start date: January 2016

End date: November 2018

Summarize your project (no more than 3 lines):

This project uses aquatic, forestry, and riparian science to create a suite of complimentary restoration and adaptation projects to buffer the effects of increased precipitation and air temperatures on cold water streams, their floodplains, and surrounding forest stands.

**WCS Climate Adaptation Fund  
2015 Full Proposal Application Form**

**Section II. ABSTRACT**

Write a short 1-2 paragraph summary of your project and request to the Wildlife Conservation Society.

Beginning with its headwaters in Vermont and flowing into western Massachusetts, the North River watershed has experienced severe erosion, bank destabilization, and loss of instream fish habitat because of increasingly frequent and intense storms over the past five years. The watershed sits within the larger Deerfield River watershed and is one of the main rivers contributing cold water input and wild fish stocks to the Deerfield River. However, projected increases in temperature and precipitation due to climate change further subject the North River stream network and surrounding forest stands to the potential loss of high-quality coldwater fish habitat, increases in invasive flora and fauna, and highly variable precipitation and flow regimes.

We propose a series of reinforcing, scalable actions to help riparian and coldwater stream systems transition through climate change, maintaining the productive public fisheries and private timberlands throughout the watershed. Dovetailing projects between the two ecosystems will act to provide stream shading, sediment retention, improved native fish habitat, and increased stream connectivity by using transitional riparian forest management techniques, instream large wood installations, culvert removal, and bank stabilization projects. Primary partners include the Franklin Land Trust in Shelburne, MA, and the Vermont Land Trust in Brattleboro, VT, the Franklin Regional Council of Governments in Greenfield, MA, and Windham Regional Planning Commission in Brattleboro, VT, Massachusetts Department of Ecological Restoration, Vermont Fish and Wildlife, and the national non-profit American Rivers. Project actions will culminate in two sets of outreach materials: the Foresters for Fish program to be created by the Franklin Land Trust for use by private landowners and a Stream Connectivity Toolkit created by Trout Unlimited for use by towns and municipalities.

## Section III. **PROPOSAL NARRATIVE**

### **1. Geography**

In what area, state(s), or region will your project be conducted?

This project focuses on the North River watershed (NRW; HUC ID 010802030402), a subwatershed within the Deerfield River basin, and includes the towns of Whitingham and Halifax in Vermont and Heath and Colrain in Massachusetts. The NRW includes 193 miles of streams, which drain 93 square miles of land comprised of 83% forested cover, 13% agricultural areas, and 4% urban development. In MA, 5.8 square miles of the forested lands are protected by the state and 5.9 square miles are held in conservation easement or by a land trust based on the Massachusetts 'Protected and Recreational Open Space' GIS data layer, updated in January 2015<sup>1</sup>. In VT, 1.8 square miles of the forested lands are held in conservation easement through the Vermont Land Trust<sup>2</sup>. See Map 1 included below.

Demonstration riparian management actions for the Foresters for Fish program will occur at the 100-acre Crowningshield property in Heath, MA, acquired by Franklin Land Trust in 2015 (see Map 2 included below). The property is situated along the West Branch of the North River and includes approximately 5,500 feet of frontage along the water, with shoreline along both sides of the river for nearly half of this distance. The pilot project area includes 20.5 acres of Aquatic Core Habitat<sup>3</sup>.

### **2. Climate adaptation science**

- a) Describe the relevant climate science for your project area. What impacts are projected? To what degree are your project's focal ecosystems expected to be vulnerable to, or benefit from, changes in climate and other environmental conditions? How might climate change affect your ability to achieve conservation goals for your focal ecosystems and species?
- b) Tell us how the proposed work will help achieve conservation goals for the focal system in light of climate change, based on the science referenced above. Explain the process by which you determined that the actions proposed are likely to be the most effective interventions for adaptation at your site or landscape. **What other actions did you consider and how has climate change influenced your selection of the actions proposed here? Clearly connect the dots between the applicable climate science, your conservation goals and your proposed actions. Tell us what you are doing differently because of climate change.**

New England has been subject to the initial effects of climate change with more projected to come. In western Massachusetts, aside from the obvious results of Tropical Storm Irene in 2011 and an increasing series of microbursts and flash floods in 2014, an array of regional climate models highlight several key climatic changes predicted to occur over the next 20-80 years. The PRESIC regional model (which uses the latest improved version of the Hadley Centre, UK, atmosphere-ocean general circulation model) shows that mean surface air temperatures (SAT) in MA will rise by 3-4°C in both summer and winter based on two different emissions scenarios and up to 6°C in summer months<sup>4</sup>. Changes in SAT have been strongly correlated to change in water temperature<sup>5</sup>. The mean precipitation will increase up to 6-8% in winter months while summer precipitation will decrease by 3-5% based on two emissions scenarios. Further analysis by the US Global Change Research Program<sup>6</sup> determined that there will be a substantial increase in extreme events in the northeast, including extended high summer temperatures and more frequent and intense storms. In recent projects, we have been using Northeast Regional Climate Center's revised downscaled rainfall data<sup>7</sup>. Such extreme events will compromise infrastructure and stress native ecosystems through the coming century.

Climate change projections affecting cold water streams and their inhabitants have important implications for this ecosystem. Temperature-sensitive fish like brook trout, mottled sculpin, several species of dace and darters will be forced to migrate to thermal refugia in warmer summer months or become extirpated. Increased frequency and intensity of large storm events homogenize in-stream habitat<sup>8</sup> and remove large woody material that is key habitat for fish, turtles, and several semi-aquatic mammals. Warmer winters facilitate the spread of invasive flora and fauna that threaten riparian forest buffers that shade much of the NRW. We plan to manage these ecologically and economically important stream and riparian areas to transition with the changing climate to maintain the important functions of these paired systems necessary for the survival of vulnerable aquatic and semi-aquatic species.

The project systems' vulnerability varies depending on the targeted action and the specific location of the project sites. Some stream reaches are located in deep ravines with areas of fractured bedrock that input colder groundwater into the stream; these areas will be less vulnerable to the effects of warmer temperatures and potential loss of forest shading, but they are few and cannot compensate for warming throughout the stream. Steep ravines and bedrock ledges may help insulate certain forest types from some of the effects of climate change, but models used to predict the spread of invasive insects across a landscape are not reliable in terms of the timing of the spread<sup>9</sup>. The North River watershed as a whole is currently ranked by the North Atlantic Aquatic Connectivity Collaborative as moderate to highly vulnerable to the effects of climate change<sup>10</sup>. Other aspects such as the stress of extreme precipitation events on road-stream infrastructure or geomorphic stability will only become more vulnerable to failure over time as storm events become larger and more frequent.

Climate change has a significant role in whether our overall conservation goals can be achieved on many fronts. Making ecological changes to a system requires a period of establishment whether it is settling sediment, new vegetation taking root, or species finding newly reconnected habitat. For more constructed projects, such as culvert replacements and in-stream wood additions, we design installations based on certain assumptions. We design culvert replacements to 1.2 times the stream bankfull width to accommodate larger storm events and in-stream material movement<sup>11</sup>, but that is based on current or near-future (up to 10yr) bankfull averages. With an anticipated lifetime of 75+ years per structure, 1.2 times current bankfull may eventually be inadequate compared to the average storm. When creating in-stream wood additions, we lodge key pieces on objects we assume are highly stable. Depending on the intensity and frequency of storms in the years immediately following project completion, there is always a risk of ecological modifications and new installations failing or being at least partially disassembled.

Our work will target the issues of 1) stream warming and species' access to thermal refugia, 2) invasive species infiltration and associated tree mortality, 3) geomorphologic instability and associated sedimentation, and 4) loss of road-stream infrastructure due to undersized hydraulic capacity. We plan to mitigate the increase in stream temperature by introducing in-stream large wood for shading, increasing mesohabitat complexity including larger and deeper scour pools with the hydraulic changes caused by in-stream wood additions<sup>12</sup>, and maintaining forest canopy shading (see issue 2). By pairing these in-stream alterations with repairing road-stream crossings that present height and velocity barriers, we increase connectivity between thermal refugia. Second, we recognize that the loss of some types of tree species and forest stands will decline so the best course of action at this point is to help transition these vulnerable stands gradually with selective cutting or girdling in order to maintain regular stream shading<sup>13,14</sup> with species predicted to fare better under projected conditions<sup>15</sup> and mitigating the intrusion of economically poor tree species and invasive flora. This action will require regular monitoring and minor maintenance already employed by foresters at local land trusts. The third issue of geomorphology and sedimentation is partly addressed by the actions taken in part one. In-stream woody additions help disrupt hydraulic flow

patterns and facilitate the transportation or retention of different sediment types. Such hydraulic disruptions can also be used to shield vulnerable banks from destabilizing high flows while pushing more flood waters into floodplains, distributing sediment and nutrients into riparian habitat<sup>16</sup>. We will also use more direct bank stabilization techniques such as buried timber and root wads and selective plantings as the sites necessitate. The fourth issue is addressed by actions from part one: replacing hydraulically undersized culverts not only improves habitat connectivity but also allows mobile large woody material, sediment, and higher flows to pass under roads, vastly decreasing the structure's likelihood of failure during large storm events.

These actions were chosen based on reports and prioritizations conducted during previous projects led by Trout Unlimited (TU) and several of our current collaborators (see section 7. Leveraged Resources). Franklin Land Trust (FLT) purchased the Crowningshield Farm property (see section 1. Geography) earlier this year in part for the excellent, yet flood battered, stream resources on the property. They initiated the request for an in-stream and riparian management plan into which we are incorporating future climate change considerations. Working with FLT, we identified other landowners in the watershed with land bordering or encompassing North River tributaries. The Franklin Regional Council of Governments (FRCoG) contracted a geomorphic stability survey of the North River watershed through a private environmental consultant after several large bank failures led to significant damage during Tropical Storm Irene in 2011. The report was completed in 2014 and prioritized twenty locations that were vulnerable to further destabilization and disturbance in future flood events. Working with FRCoG, we have selected three of the top five prioritized sites identified in the report to work on during this project. Culvert selection for replacement was conducted in part thanks to the ongoing road-stream assessment and vulnerability prioritization projects TU is currently completing for Vermont Fish and Wildlife Department in the Vermont portion of the Deerfield River watershed and for the University of Massachusetts, Amherst, and Massachusetts Department of Transportation in the MA portion of the Deerfield River watershed.

Our proposed actions are based on personal experience with other projects the New England Culvert Project has led over the past five years – each proposed action a separate project unto itself, this will be the first time we will be using the separate actions in concert together. During previous projects and through project partnerships with leading climate adaptation researchers, we have honed our methods to always incorporate future climate change to the extent that we built our own hydraulic capacity model for road-stream crossings that incorporates a range of flow conditions predicted by Cornell's Northeast Regional Climate Center. The model helps us prioritize road-stream crossings with both current and future conditions in mind. We recognize that our stream and riparian systems are already influenced by changes in temperature and precipitation and that this influence has only been compounded by historic land use and current infrastructure. Because of climate change we know it is not enough to try to counter current conditions, but help prepare our valuable natural resources to respond to a variety of potential future conditions.

### 3. Activities and Timeline

Provide a list of the specific activities you propose and a timeline for their implementation.

Activity	2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b><i>Create, publish, and promote adaptation toolkit for municipalities</i></b>	X	X		X	X	X		X
Compile step-by-step processes for common road-stream adaptation actions (including culvert replacement and bank stabilization)	X	X						

Compile pertinent state regulations and contact information		X						
Design and edit toolkit				X	X			
Send toolkit to select municipalities to review					X	X		
Secondary edit and design						X		
Final publication and distribution								X
<b>Replace 2 culverts: 1 in MA, 1 in VT</b>		X	X	X		X	X	X
Design and permit MA culvert		X	X					
Mass DOT TR-85 review for MA culvert				X				
Design and permit VT culverts			X	X				
Replace MA structure						X	X	
Replace VT structure							X	X
<b>6 in-stream large wood installations on tributaries</b>			X	X				
Site surveys and design			X					
Pre-cutting and installation				X				
<b>Adaptive riparian management plots on 2 private woodlots</b>			X	X			X	X
Site survey and management decision-making - MA site			X					
Management action implementation			X	X				
Site survey and management decision-making – VT site							X	
Management action implementation							X	X
<b>Create, publish, and promote 'Foresters for Fish' program guide for private landowners</b>			X	X	X	X		X
Expert panel convenes to detail transitional riparian management actions			X					
Edit panel recommendations into lay terms and design program guide				X				
Select landowners review draft guide					X			
Secondary edit and design						X		
Final publication and distribution								X
<b>3 bank stabilization projects on main stem</b>						X	X	
Design and permit projects						X		
Implement construction						X	X	

#### 4. Anticipated Outcomes

Climate change effects addressed by	Deliverables during the grant period (max. 2	Expected near-term (3-10 years) conservation	Expected long-term (10-50 years) adaptation goals
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project	years)	outcomes	
<ul style="list-style-type: none"> <li>• Warmer stream temperatures.</li> <li>• More frequent and intense precipitation events.</li> <li>• Spread of invasive species.</li> <li>• Change in species range and loss of certain species at the southern limits of their range.</li> <li>• Loss of stream shading due to tree loss from invasive species or range shift.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace 2 degraded or undersized culverts on North River tributaries, 1 in MA &amp; 1 in VT.</li> <li>• Complete 3 bank-stabilization projects on mainstem North River.</li> <li>• Complete 6 in-stream large wood restoration projects in North River tributaries over approximately 5 miles of stream.</li> <li>• Pilot riparian management initiative “Foresters for Fish” on 2 private woodlots.</li> <li>• “Foresters for Fish” guide for private landowners.</li> <li>• Flood and stream infrastructure facilitation workbook for municipalities.</li> </ul>	<ul style="list-style-type: none"> <li>• Reconnect coldwater habitat to increase access to thermal refugia, spawning habitat, and feeding areas – total mileage will depend on location of crossing chosen by towns, minimum 5 miles reconnected habitat per crossing.</li> <li>• Increased in-stream habitat structure and diversity provide greater carrying capacity for aquatic and semi-aquatic organisms.</li> <li>• Improved hydraulic capacity at 3 road-stream crossings reduces stream incision, sediment scour, and infrastructure vulnerability during high-flow storm events.</li> <li>• Increased flow complexity and pool depth, maintain or increase thermal refugia.</li> <li>• Increased participation of private landowners in “Foresters for Fish” program.</li> <li>• Increased participation of municipalities in infrastructure restoration in NRW and surrounding areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Stable abundance of coldwater fish species in NRW headwaters.</li> <li>• Minimal open riparian areas due to tree mortality from invasive pests.</li> <li>• Complex in-stream habitat including fast riffles, deep pools, and abundant in-stream wood.</li> <li>• Good physical condition, adequate hydraulic capacity, and suitable passage at replaced road-stream crossings.</li> <li>• Further implementation of “Foresters for Fish” program in NRW and surrounding watersheds.</li> <li>• Further replacement of road-stream crossings in NRW and surrounding watersheds.</li> </ul>

## 5. Monitoring

What are your plans for monitoring during and beyond the extent of this grant to measure progress towards achieving your near-term outcomes and long-term adaptation goals? Describe how you will establish baseline conditions and identify the indicator(s) you will need to evaluate your success. Comment briefly on 1-2 uncertain aspects or key assumptions of your project and how monitoring (either your own effort or monitoring by others) could be used to adjust conservation actions for your project in the future as climate and other changes unfold?

We will establish baseline aquatic and semi-aquatic organism presence and abundance using electroshocking, invertebrate sampling, and monthly riparian monitoring to evaluate improved in-stream habitat, including wood installation projects and culvert replacements. We will also use state electroshocking surveys from the area to help establish a recent population abundance trends. In years two and three (the third year being funded by the NRCS Conservation Innovation Grant) large wood installation sites will be monitored for loss or gain of woody material. In years three and five (supplemented by future grants and partnerships with the state wildlife agencies and local universities) aquatic and semi-aquatic



organism monitoring will be done to note any changes in presence and abundance of species in the system, especially comparing upstream and downstream reaches around culvert replacements.

Because we cannot add material back to destabilized banks to reach some prior state, these three sites will be monitored based on retaining current conditions as much as possible. We will drive rebar into banks at locations triangulated by distance and bearing to permanent markers. Bank height and distance from the rebar will be measured after spring thaw and again in late fall each year for three years. All woodloading and bank stabilization sites will be photographed in the spring and fall of each year for visual changes.

Sediment retention for habitat improvement around wood installation sites will be evaluated based on substrate size, sorting, and mesohabitat complexity. Substrate size and sorting will be measured at stream cross-sections 5ft and 10ft upstream and downstream of in-stream wood installations. Cross-sections will be monitored in early summer and late fall each year. Mesohabitat (riffle, run, and pool habitat segments) will be measured beginning 10ft downstream of the first in-stream wood installation and continue to 10ft upstream of the last in-stream wood installation; it will be remeasured in early summer for changes to mesohabitat segment length and total number of segments - indicative of overall stream habitat complexity.

Land trusts will monitor riparian management areas on private timberlands. Species composition, basal area, and early successional changes in cut areas will be evaluated immediately before management actions are taken, one year later, and three years later, then sites will be evaluated every five years after that. A yearly walk-through of the property will allow more regular monitoring for evidence of invasive species. The evaluation and success of management actions will depend on the actions agreed-upon by the landowner and land trust.

There are always uncertainties in conservation management; in this case two primary uncertainties are sediment stability and the rate of invasive species-related degradation. When we do bank stabilization or in-stream woodloading projects, we cannot do extensive substrate borings at every site and make certain assumptions about subsurface bank sediments to make recommendations for stabilization based on surface conditions. Thus we monitor bank stabilization areas frequently in order to gauge whether our previous assumptions were correct, and if not, then how we can alter a design to account for this new set of variables (i.e. when coarse substrate is actually underlaid by loose or sandy substrate). Secondly, in forest stands which are not yet affected by invasive insects or other effects of climate change we cannot know when such transitions will occur. Many foresters and fisheries professionals are hesitant to remove too much of a vulnerable, but key, species before its time (i.e. hemlock stands potentially threatened by woolly adelgid that shade a brook trout stream). Here, monitoring for the early presence of woolly adelgid will allow us to keep hemlock stands largely intact with some selective transitional cutting until the invasive insect is detected and more drastic actions can be initiated.

## 6. Communications

- a) Indicate how you plan to share your accomplishments related to the project. Who are the key audiences and other stakeholders that should know about this work and how will you reach them?
- b) How might this project inform or influence similar climate adaptation work in your project area or other geographies? What process or policy changes do you believe will be necessary to scale up the adoption and acceleration of climate adaptation action in your region?

Outreach communications for this project will be hosted in three ways: an adaptation toolkit for municipalities, a riparian management guide for private landowners, and a listing on the Climate Change Response Framework hosted by the US Forest Service's Northern Institute of Applied Climate Change.



These communication resources are designed to be flexible and scalable enough to be used by public and private stakeholders throughout the region.

The Climate Change Response Framework (<http://www.forestadaptation.org/>) is a website built to highlight projects that incorporate climate change into management actions throughout the Forest Service's Northeastern region. It provides an online collaborative space for agencies, managers, landowners, and other researchers to learn about new approaches to increasing challenges.

The riparian area management guide for private landowners, dubbed the "Foresters for the Fish" program and based on Vermont Audubon's highly successful "Foresters for the Birds" program, will be a printed booklet created and distributed through the collaboration of Trout Unlimited, the Massachusetts Woodlands Institute, the Franklin Land Trust, and the Vermont Land Trust. This guide will be used with current easement-holders as well as a potential incentive for landowners that may put property into easement in the future. Because management actions on conservation easements are quite similar across states, we do not anticipate many policy or process changes if other land trusts choose to adopt the Foresters for Fish program.

The adaptation toolkit for municipalities is designed to be a framework for towns that want to take steps towards reducing their road-stream vulnerability, but may not have a project manager or organization available to help them. The guide will give specific information on resource and regulations specific to the project states: Vermont and Massachusetts. Other organizations or states can adapt the guide to their own state-specific regulations and contacts, although the practices and adaptation principles that form the bulk of the guide will remain the same. Trout Unlimited will distribute the guide both in a printed version presented to town Selectboards and Highway Supervisors as well as host a PDF version on the New England Culvert Project website.

## 7. Leveraged Resources

To what extent will your proposed project be able to take advantage of existing resources (e.g., other funding, previous conservation efforts, protected areas, partner resources, related conservation and adaptation projects)? Is this project a component in a larger conservation endeavor or a stand-alone effort?

Other Leveraged Funds	Amount	Status
Orvis 1,000 Miles Campaign	\$ 60,000.00	Granted – annual culvert replacement work
USFS: Green Mountain National Forest	\$ 28,000.00	Granted – partial funding through larger grant
Volunteer hours (valued at \$22.50/hr)	\$ 5,270.00	Granted

This project is one of the first steps initiated by the Deerfield River Collaborative, a group of federal, state, local, and non-profit agencies in Massachusetts and Vermont focused on maintaining and improving natural resources in the Deerfield River Watershed. Other efforts also in progress by the Collaborative include mapping predicted stream temperature changes based on multiple climate change scenarios which was completed this summer and used to prioritize stream habitat most vulnerable to warming; geomorphic stability assessments conducted by Franklin Regional Council of Governments and Windham Regional Commission to identify an extensive array of bank stabilization projects in the North and Green River watersheds which was completed last fall and used to choose our three bank stabilization projects; and Trout Unlimited's previous work on two separate projects with the Vermont Fish and Wildlife Department and the University of Massachusetts, Amherst, and Massachusetts Department of Transportation to assess, model, and prioritize replacement of road-stream crossings in the Deerfield River watershed which will be completed this fall.

## 8. Partnerships

Who are your organizational partners on the project and what is their role?

Partner	Contact	Role
Massachusetts Woodlands Institute	Emily Boss, Director (413)-625-9151 emily@masswoodlands.org	Lead the pilot work and outreach material production for the 'Foresters for Fish' initiative
Franklin Land Trust	Will Sloan Anderson, Head Land Steward (413)-625-9151 wsloananderson@franklinlandtrust.org	To secure and work with woodlot owners whose property borders or encompasses North River tributaries.
Franklin Regional Council of Governments	Kimberly Noake MacPhee, Land Use Program Manager (413)-774-3167 kmacphee@frcog.org	Will work directly with town Selectboards, Conservation Commissions, and Highway Superintendents to select high-priority culverts to replace.
Northern Institute of Applied Climate Science	Maria Janowiak, Scientist 906-482-6303 mjanowiak02@fs.fed.us	Climate information specialist to help inform riparian management actions, help prepare and inform 'Foresters for Fish', and communicate project results through the Climate Change Response Framework.
Windham Regional Planning Commission	John Bennett, Senior Planner (802)- 257-4547 johnbenn@windhamregional.org	Will work directly with Selectboards and Highway Superintendents to select high-priority culverts to replace.

## 9. Organizational Qualifications

Why is your organization particularly qualified to address the identified need? What is the added value of your organization's participation in this project?

Over the last five years, the Trout Unlimited New England Culvert Project (NECP) has assessed over 4,000 public road-stream crossings across three states. Based on the prioritizations of our trio of vulnerability models (aquatic organism passage, geomorphic stability, and hydraulic capacity) the NECP has replaced 22 degraded crossings, reconnected over 60 miles of fragmented trout stream habitat, and completed over 20 miles of degraded in-stream habitat with large wood restoration projects on public and private lands. The New England Culvert Project prides itself on its multi-system landscape-scale approach to restoration and adaptation work. We use a science-based approach to implement actions that was recently lauded by the American Fisheries Society and published in the journal Fisheries.<sup>17</sup> This project acknowledges that while good watershed management generally increases ecosystem resilience, climate change requires rethinking current practices and identifying new or different actions that anticipate future conditions and risks.

## 10. Key Staff

Include a brief bio or list of qualifications for personnel, from both your own organization and partners, who bear principal responsibility for implementation of this project.

**Erin Rodgers**, Field and Research Manager for the New England Culvert Project of Trout Unlimited. Erin has a Ph.D. in Stream Ecology from Antioch University New England and joined Trout Unlimited in 2012. In her role as Field Manager, she has overseen over 2,500 culvert assessments in six New England watersheds, analyzed assessment results for aquatic organism passage (AOP) and hydraulic vulnerability, coordinated municipal outreach efforts in Massachusetts and Vermont, and helped implement a variety of culvert and in-stream restoration projects. Erin will manage and oversee the science and monitoring and be the primary coordinator of the community outreach efforts.

**Colin Lawson**, Project Coordinator for the New England Culvert Project (NECP) of Trout Unlimited. Colin created the NECP in 2010 after completing his MS at Antioch University New England in the environmental

sciences. Colin's thesis work centered on assessing community infrastructure vulnerability related to severe weather events driven by climate change. Since then he has overseen over a dozen watershed assessment projects, created a user-friendly structural hydraulic assessment model, and completed projects to replace degraded crossings, remove dams, reconnect fragmented brook trout stream habitat, and install in-stream large wood habitat on both public and private lands. Colin will be the project administrator, manage design and engineering needs, and coordinate construction oversight.

**Will Sloan Anderson**, Head Land Steward at the Franklin Land Trust in Shelburne, MA. Will has practiced forest and farm management for the land trust and landowners throughout Massachusetts. He received degrees in Natural Resources from Sterling College and University of Massachusetts. Will was a founding staff member at the Farm School where he developed curriculum and taught forestry and agriculture, specializing in grazing systems. Will came to the Franklin Land Trust in 2000 as a part time land steward overseeing FLT's early conservation restrictions. He has been head of Stewardship at FLT since 2007. He will manage the implementation of the forestry initiatives as well as provide forestry management assistance to communities and private landowners.

**Emily Boss**, Director, Massachusetts Woodlands Institute and Land Protection Specialist at Franklin Land Trust. Emily has a MS in Forest Resources from the University of Massachusetts, Amherst and is licensed to practice forestry in Massachusetts. She has been director of the MA Woodlands Institute since 2010 and joined the Franklin Land Trust in 2011 to facilitate the conservation of farms and undeveloped fields and forests in western Massachusetts. As Director of the Institute she has managed MWI's involvement in the Stewardship Program, a cost share and technical assistance for forest landowners administered by the MA Department of Conservation and Recreation, and the implementation of Foresters for the Birds in Massachusetts. Emily will manage the creation of the "Foresters for Fish" initiative as well as develop a silviculture tool-kit / guide for each community project.

**Carrie Banks**, Stream Team & Westfield River Committee Coordinator, Massachusetts Division of Ecological Restoration. Carrie has extensive experience working not only on stream crossing surveys and design, but also working with citizen science volunteers and town leaders to provide important insight and assistance working through these projects. As DER's regional Project Manager for a variety of restoration projects across western MA, Carrie will support this project through evaluating designs, permit reviews, community outreach and construction oversight. Carrie has been, and will be, involved with project planning, assistance with data collection, design and permit review and volunteer training for post construction site assessment and photo monitoring.

## 11. References

Please list two references (include name, title, organizational affiliation, email, phone number) who can speak to the successful implementation of the project described in your proposal.

Dan McKinley, U.S. Forest Service, Fisheries Program Manager  
Green Mtn. National Forest, 231 North Main Street, Rutland, VT 05701  
(802) 747-6738  
dmckinley@fs.fed.us

James MacCartney, National Park Service, River Manager  
Wild & Scenic Rivers Program, 54 Portsmouth Street, Concord, NH 03301  
(603) 226-3240  
Jim\_MacCartney@nps.gov

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- <sup>11</sup> Massachusetts Office of Geographic Information (MassGIS). Protected and Recreational Open Space Datalayer, updated January 12, 2015. <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/osp.html>
- <sup>2</sup> Windham Regional Commission, Protected and Easement Lands Geographic Information System (GIS) Datalayer, updated January 2014. Jeff Nugent, Senior Planner for Mapping and GIS, Windham Regional Commission, Brattleboro, VT.
- <sup>3</sup> Woolsey, H., A. Finton, J. DeNormandie. 2010. *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*. MA Department of Fish and Game/Natural Heritage & Endangered Species Program and the nature Conservancy/Massachusetts program. <http://maps.massgis.state.ma.us/dfg/biomap2.htm>
- <sup>4</sup> Fan, F., Bradley, R. S., Rawlins, M. C. (2014). Climate change in the northeastern US: regional climate model validation and climate change predictions. *Climate Dynamics*, 43, 145-161.
- <sup>5</sup> Mohseni, O., Stefan, H. G. (1999). Stream temperature/air temperature relationship: a physical interpretation. *Journal of Hydrology*, 218:3-4, 128-141.
- <sup>6</sup> Horton, R., Yohe, G., Easterling, W., Kates, R., Ruth, M., Sussman, E., Whelchel, A., Wolfe, D., and Lipschultz, F. (2014). Ch. 16: Northeast. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 16-1-nn.
- <sup>7</sup> Northeast Regional Climate Center, Cornell University, Ithaca, NY. [http://www.nrcc.cornell.edu/page\\_databases.html](http://www.nrcc.cornell.edu/page_databases.html)
- <sup>8</sup> Death, R. G., Fuller, I.C., Macklin, M.G. (2015). Resetting the river template: the potential for climate-related extremem floods to transform river geomorphology and ecology. *Freshwater Biology*, (early online publication). DOI: 10.1111/fwb.12639
- <sup>9</sup> Fitzpatrick, M.C., Preisser, E. L., Porter, A., Elkington, J., Ellison, A. M. (2012). Modeling range dynamics in heterogeneous landscapes: Invasion of the hemlock woolly adelgid in eastern North America. *Ecological Applications*, 22:2, 472-486. DOI: 10.1890/11-0009.1
- <sup>10</sup> North Atlantic Aquatic Connectivity Collaborative Subwatershed Prioritization Map: <http://tnc.maps.arcgis.com/apps/webappviewer/index.html?id=f64c9c61e01d4befafdb63afa638511f>
- <sup>11</sup> Cenderelli, D., Clarkin, K., Gubernick, R., Weinhold, M. (2011). Stream simulation for aquatic organism passage at road-stream crossings. *Transportation Research Record: Journal of the Transportation Research Board*, 2203, 36-45. DOI: 10.3141/2203.05
- <sup>12</sup> Elliott, J. M. (2000). Pools as refugia for brown trout during two summer droughts: trout responses to thermal and oxygen stress. *Journal of Fish Biology*, 56:4, 938-948.
- <sup>13</sup> Siderhurst, L., Griscom, H., Hudy, M., Bortolot, Z. (2010). Changes in light levels and stream temperatures with loss of eastern hemlock (*Tsuga Canadensis*) at a southern Appalachian stream: implications for brook trout. *Forest Ecology and Management*, 260:10, 1677-1688.
- <sup>14</sup> Stadler, B., Muller, T., Orwig, D., Cobb, R. (2005). Hemlock woolly adelgid in New England forests: canopy impacts transforming ecosystem processes and landscapes. *Ecosystems*, 8, 233-247.
- <sup>15</sup> Canham, C. D., Papaik, M. J., Uriarte, M., McWilliams, W. H., Jenkins, J. C., Twery, M. J. (2006). Neighborhood analyses of canopy tree competition along environmental gradients in New England forests. *Ecological Applications*, 16, 540-554.
- <sup>16</sup> Palmer, M. A., Bernhardt, E. S., Allan, J. D., Lake, P. S., Alexander, G., Brooks, S., Carr, J., Clayton, S., Dahm, C. N., Follstad Shah, J., Galat, D. H., Loss, S. G., Goodwin, P., Hart, D. D., Hassett, B., Jenkinson, R., Kondolf, G. M., Lave, R., Meyer, J. L., O'Donnell, T. K., Pagano, L., Sudduth, E. (2005). Standards for ecologically successful river restoration. *Journal of Applied Ecology*, 42:2, 208-217.
- <sup>17</sup> Williams, J. E., Neville, H. M., Haak, A. L., Colyer, W. T., Wenger, S. J., Bradshaw, S. (2015). Climate change adaptation and restoration of western trout streams: Opportunities and strategies. *Fisheries*, 40:7, 304-317. DOI: 10.1080/03632415.2015.1049692

**Section IV. PROJECT BUDGET & JUSTIFICATION**

Please list all expenses allocated to this project.

**Salaries and wages**

1. Program staff salaries and wages	Number of people	% time on project (min. 5%)	Wildlife Conservation Society (WCS) share	All non-WCS funds	Total
Title of position					
Colin Lawson (TU) – Project Coordinator	1	26	\$15,000	\$13,600	\$ 28,600
Erin Rodgers (TU) – Field Manager	1	44	\$20,000	\$41,600	\$ 61,600
Will Sloan Anderson (FLT) – Head Land Steward	1	18	\$ 8,000	\$ 4,000	\$ 12,000
Emily Boss (MWI) - Director	1	18	\$ 8,000	\$ 4,000	\$ 12,000
Total salaries and wages			\$51,000	\$63,200	\$114,200
Fringe benefits			\$ 9,800	\$ 5,200	\$ 15,000
Total salaries, wages, and benefits			\$60,800	\$68,400	\$129,200
2. Contract services	Number of days on project	Daily rate fee basis			
Type of consultant or contractor					
Forestry – Consulting	18	\$ 567	\$ 2,041	\$ 8,165	\$ 10,206
Culvert Replacement – Contractor	10	\$4,250	\$ 8,500	\$ 34,000	\$ 42,500
Bank Stabilization – Contractor	9	\$3,600	\$ 6,480	\$ 25,920	\$ 32,400
Large Wood Installation - Contractor	12	\$6,000	\$14,400	\$ 57,600	\$ 72,000
Total contract services			\$31,421	\$125,685	\$157,106
<b>Other Expenses</b>					
3. Travel			\$ 10,000	\$ 15,000	\$ 25,000
4. Communications			\$ 25,000	\$ 15,000	\$ 40,000
5. Capital expenses (supplies/materials/equipment)			\$ 80,000	\$162,000	\$242,000
6. Other (Specify line items)			\$ 20,000	\$ 20,000	\$ 40,000
7. Overhead/Indirect Costs (WCS share can be max 10% of direct request amount). Unrealized overhead costs are not eligible for match.			\$ 22,722	\$ 23,499	\$46,221

**Total project expenses**\$249,943\$429,584\$679,527**EXPLANATION OF PROJECT BUDGET EXPENSE LINE ITEMS**

1. Program salaries and wages: payments of salaries and wages to program staff allocated for work directly related to this project. Please indicate position title, number of people with this title working on the project, the percentage of each person's time devoted to the project and the calculated cost of that time. **Please do not include any staff member committing less than 5% time.**

For example:

Title of position	No. of people	% time on project	Total
Director of Conservation (annual salary \$40,000)	1	25%	\$10,000

Benefits: costs other than wages or salaries that are attributable to the program employees above, such as Social Security, health insurance and pension contributions, prorated for this project. For example: If your organization's benefit package totals 15 % of gross salaries, the benefits for the Director of Conservation would be \$1,500 (.15 x \$10,000).

2. Contract services: costs of personnel who are not on the staff of your organization, but whose services are required in order to complete the project successfully. This could include consultants, technicians, laborers, advisers and support personnel. Please specify type of contractor, number of days committed to this project, rate charged per day (or other fee basis) and calculated total cost.

For example:

Type of consultant or contractor	No. days on project	Daily rate	Total
Restoration	10	\$250	\$2,500

3. Travel: transportation and accommodations, per diem and mileage allowances, and lodging expenses or staff and contract personnel associated with the project.

4. Communications: all costs for marketing/promotion such as campaign and materials development, design and production; advertising space or time; printing and mailing materials; media production; and other promotion and publicity activities related to this project. This figure may include funds passed through to a partner organization or contractor for communications around the project.

5. Capital expenses: costs of project materials, supplies and other consumables, vehicles and equipment; renovations or improvements involving structural changes; and other capital expenditures directly associated with this project. Please make clear in budget narrative whether equipment costs are purchase or rental charges. Capital expenses should not exceed 50% of your request amount.

6. Other expenses: all other expenses directly related to this project that are not included in the categories above. Please specify type of expense on budget form and provide additional detail in the narrative.

7. Overhead/Indirect Costs: rent, utilities, insurance, office supplies, telephone, internet, or other similar expenses allocated to this project. Note that the WCS Climate Adaptation Fund will support a maximum overhead charge of 10% of the amount of your grant request, not 10% of the overall project budget. Total request amount to WCS, including overhead, can not exceed \$250,000.

**Unrealized overhead/indirect costs not paid for by this grant may not be used toward the 1:1 match requirement or to increase the overall project budget against your request. Contact us with questions on representing indirect costs.**

contractor

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## BUDGET JUSTIFICATION AND MATCHING FUNDS

- a) Provide a brief justification below for each line item in your budget request.

### 1. Salaries & Wages

(All rates are in line with federal guidelines and local rates, to ensure project is cost effective.

WCS Requested Total: \$60,800

Trout Unlimited (TU): The TU salary request is 74% (\$44,800.) of the overall WCS salary request. The salary identified here will be used to administer the overall project as well as oversee the entire field and technical aspects of the project (i.e. develop and coordinate the Project Team, coordinate invoicing, field team management, and construction oversight). The WCS supported salary for the administrative position will be \$14,300/year, \$28,600 for 2 years. TU's field manager will coordinate all of the project oversight at roughly \$30,800/year, or \$61,600 for 2 years. The WCS request is approximately 20% of the of the overall salary.

Franklin Land Trust (FLT): As our primary partner, FLT will coordinate the terrestrial portion of this project overseeing contractors as well as the technical forestry aspects of the project. WCS supported salary for FLT positions will be \$8,000/year, or \$16,000 for 2 years; fringe is not included as it is calculated within the stated salary.

Non-match salary for this project, at approximately 80% of the overall salary expense line; this additional support has been committed by a combination of both federal and non-federal dollars.

Fringe Benefits:

WCS Requested Total: \$9,800

The requested fringe rate from WCS for TU was calculated at our federally agreed rate of 28%. The total is \$35,000 X 0.28 or a total \$9,800. This will be distributed to the respective TU staff members based on hours worked. The fringe rate for the FLT staff is included in their stated salary.

### 2. Contract Services

WCS Requested Total: \$31,421

The contract services line is separated in two primary categories: consulting and construction. Overall, the WCS request is 20% (\$31,421) of the overall contract services budget total of \$157,106. Non-match support for this line item is \$125,685 or 80% of the overall expense line; this additional support has been committed by a combination of community, state, federal and non-federal dollars. Contract Services will include timber stand management, design and engineering, and construction/implementation work on these projects.



OTHER

**3. Travel**

WCS Requested Total: \$10,000

The WCS related travel expense is 40% (\$10,000.) of the overall travel budget of \$25,000. Travel expenses will be limited to project team members for meetings, trainings, site visits, field work and construction, and aquatic and terrestrial educational demonstrations. Reimbursed mileage will primarily include traveling within the defined project area except for Colin Lawson (TU) and Maria Janowiak (NIACS) who will need to commute a greater distance to attend program presentations. Reimbursement rate will be the federal rate of 57.5 cents per mile.

**4. Communications & Outreach**

WCS Requested Total: \$25,000

Requested funds for project communications are 62% of the overall project expense line of \$40,000. Communications will include the expert panel meeting for action recommendations, writing and design of the Foresters for the Fish and municipal adaptation toolkit, and distribution costs (not including printing). Outreach will also consist of six (6) community meetings: one for municipal planners, decision-makers, and supervisors in each town within the watershed (4 total) to present and explain the municipal adaptation toolkit, and one for private land owners in each state (2 total) hosted by the land trusts to present and explain the Foresters for Fish program and guide.

**5. Capital Expenses (supplies/materials/equipment)**

WCS Requested Total: \$80,000

This request is 33% of the overall capital expense line item (\$242,000.). Capital expenses would include the cost of bridge structures, construction materials not available through in-kind support from towns, purchase full logs (with root wads) for bank stabilizations, and stone for scour protection related to all construction projects.

**6. Other (Permit Fees/Monitoring/Printing)**

WCS Requested Total: \$20,000

This request is 50% of the overall line expense. This line item includes related permitting requirements associated with all of the restoration and construction projects, pre- and post-monitoring expenses at all of the restored sites, as well as printing all of the miscellaneous outreach materials, the adaptation toolkit, as well as the "Foresters for Fish" publication. The remaining 50% of these project expenses will be made up with both federal and non-federal dollars as well as in-kind donated materials from communities and stakeholder organizations.

**7. Overhead/Indirect Costs**

WCS Requested Total: \$22,722

Trout Unlimited's federally approved indirect rate is 16.44%. The WCS portion, limited to 10%, is applied to the WCS requested project contribution of \$227,221. The WCS contribution of \$22,722 is 49% of the overall expense line. The remaining 6.44% has been applied to the non-WCS contributions of \$365,885.

- b) Describe all additional funding sources for the project that were listed in the budget column labeled "All non-WCS funds". Also, please notate whether each of those other funding sources are currently pending, committed or received. If pending, please indicate when funds are likely to be received.

<b>All non-WCS Funds: Source</b>	<b>Amount</b>	<b>Status</b>
American Rivers	\$5,000	Granted - in-kind technical support
Community Support (2 Towns)	\$40,000	Pending - in-kind construction support
CT River Watershed Council	\$2,500	Pending - Comm. outreach support
Eastern Brook Trout Joint Venture	\$60,000	Pending - construction support
MA Dept. of Ecological Restoration	\$7,500	Granted - in-kind technical support
National Fish & Wildlife Foundation	\$27,400	Granted - partial funding through larger grant
NRCS Conservation Innovation Grant	\$123,701.00	Pending – will be notified Sept 1, 2015
Orvis 1,000 Miles Campaign	\$30,000.00	Granted
Trout & Salmon Foundation	\$1,500	Granted
UMASS / MassDOT	\$58,000	Granted - funded 2014/15 assessment work
USFS: Green Mtn National Forest	\$28,000	Granted - partial funding through larger grant
US Fish & Wildlife Service	\$20,000	Pending - in-kind engineering work
Vermont Fish and Wildlife Department	\$20,715.00	Granted
Volunteer hours (valued at \$22.50/hr)	\$5,270.00	Received & Pending
<b>Total Non-WCS Project Funding</b>	<b>\$429,584.00</b>	<b>(Received to date: \$183,385)</b>
<b>Total WCS Funding Requested</b>	<b>\$249,943.00</b>	
<b>Total Project Cost</b>	<b>\$679,527.00</b>	

Section V. **CURRENT YEAR ORGANIZATIONAL BUDGET**

Submit your organization's operating budget for the current fiscal year, including a list of major organizational funding sources.

Section VI. **BOARD OF DIRECTORS**

Insert a list of your organization's board of directors.



**Statement of Activities**  
**FY 2015 Organizational Budget**

	<b>FY2015 Total</b>
<b>REVENUE</b>	
Individual Contributions	\$ 6,835,832
Dues	\$ 5,006,287
Chapters	\$ 474,928
Foundations	\$ 10,998,322
Government Grants	\$ 16,061,445
Bequests & Memorials	\$ -
Corporations	\$ 1,405,892
Other Earned Revenue	\$ 460,000
<b>TOTAL REVENUE</b>	<b>\$ 41,242,706</b>
<b>EXPENSES</b>	
<b><i>Program Services</i></b>	
Conservation Operations	\$ 31,472,894
Membership	\$ 2,586,470
Communications	\$ 2,275,805
Membership Services	\$ 525,459
Government Affairs	\$ 592,270
<b><i>Total Program Services</i></b>	<b>\$ 37,452,898</b>
<b><i>Supporting Services</i></b>	
Administration	\$ 1,131,606
Membership Development	\$ 959,951
Development	\$ 1,945,236
<b><i>Total Supporting Services</i></b>	<b>\$ 4,036,793</b>
<b>TOTAL EXPENSES</b>	<b>\$ 41,489,691</b>
Current year operating revenue over expenses	\$ (246,985)



## Board of Trustees Fiscal Year 2015

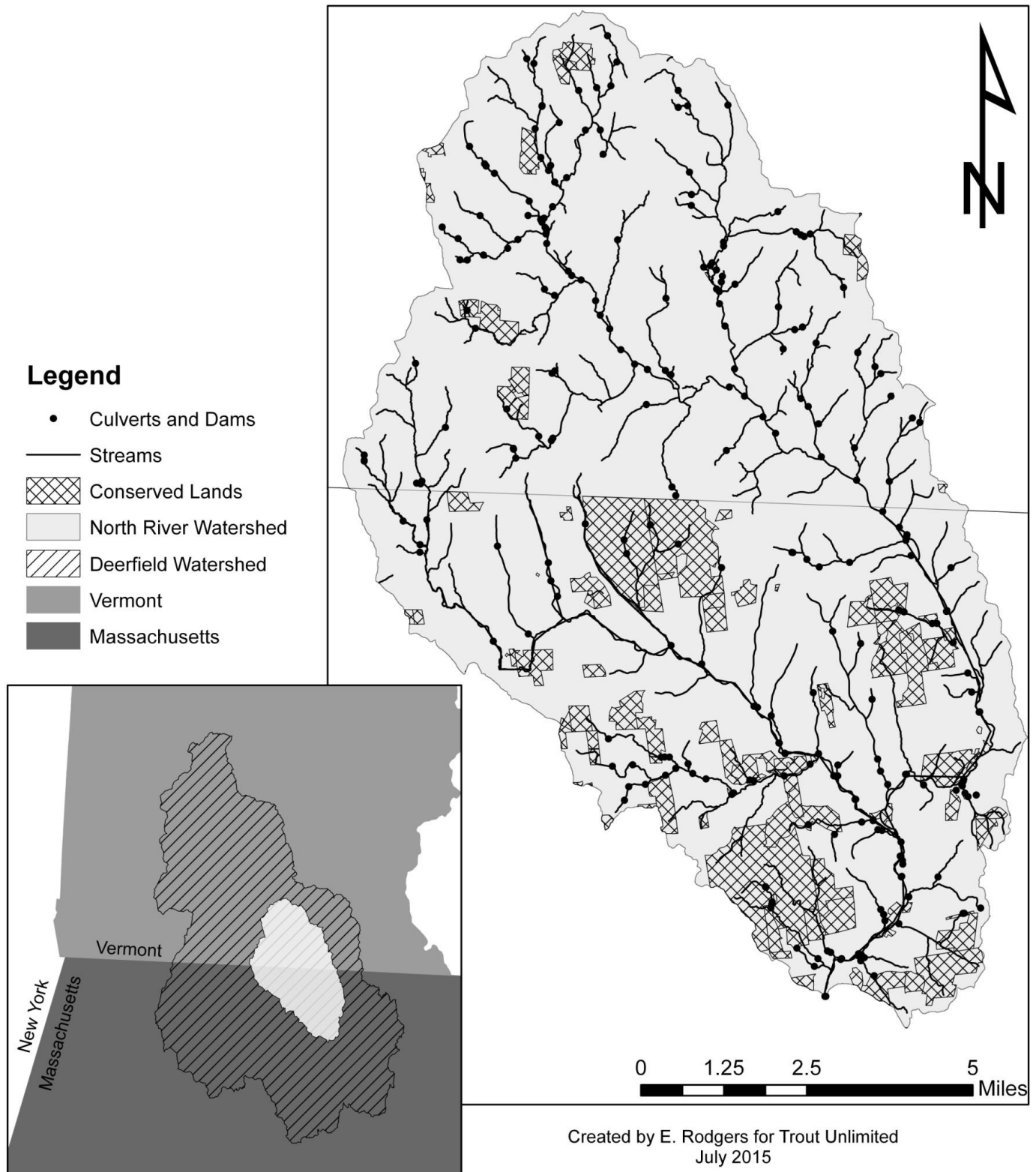
### Officers

- **Jim Asselstine, Tyler Hill, PA. *Chairman*.** 10 yrs. Retired Managing Director for Barclays Capital in New York. Previously served on the Nuclear Regulatory Commission.
- **Mick McCordle, Fairview, TX. *Chairman of the National Leadership Council*.** 5 years. Retired psychologist with a doctorate in organizational behavior from Yale University.
- **Chris Wood, Washington, DC. *President & CEO of Trout Unlimited, Inc.***
- **Mark Gates, Palo Alto, CA. *Secretary*.** 9 yrs. Actively involved in the ownership, development and management of commercial real estate partnerships in the San Francisco area and southern California.
- **Barrett Toan, Santa Fe, NM. *Treasurer*.** 3 yrs. Retired Chairman & CEO of Express Scripts.
- **Paul Doscher, Weare, NH. *Secretary of the National Leadership Council*.** 1 yr. Served as Vice President for Land Conservation at the Society for the Protection of New Hampshire Forests.
- **Jon Christiansen, Milwaukee, WI. *Chairman of the Board, Ex-Officio*.** 8 yrs. Retired Partner of Foley & Lardner.
- **David Armstrong, Greenville, SC. *Legal Advisor*.** 12 yrs. Practicing attorney since 1972, Armstrong Law Firm.

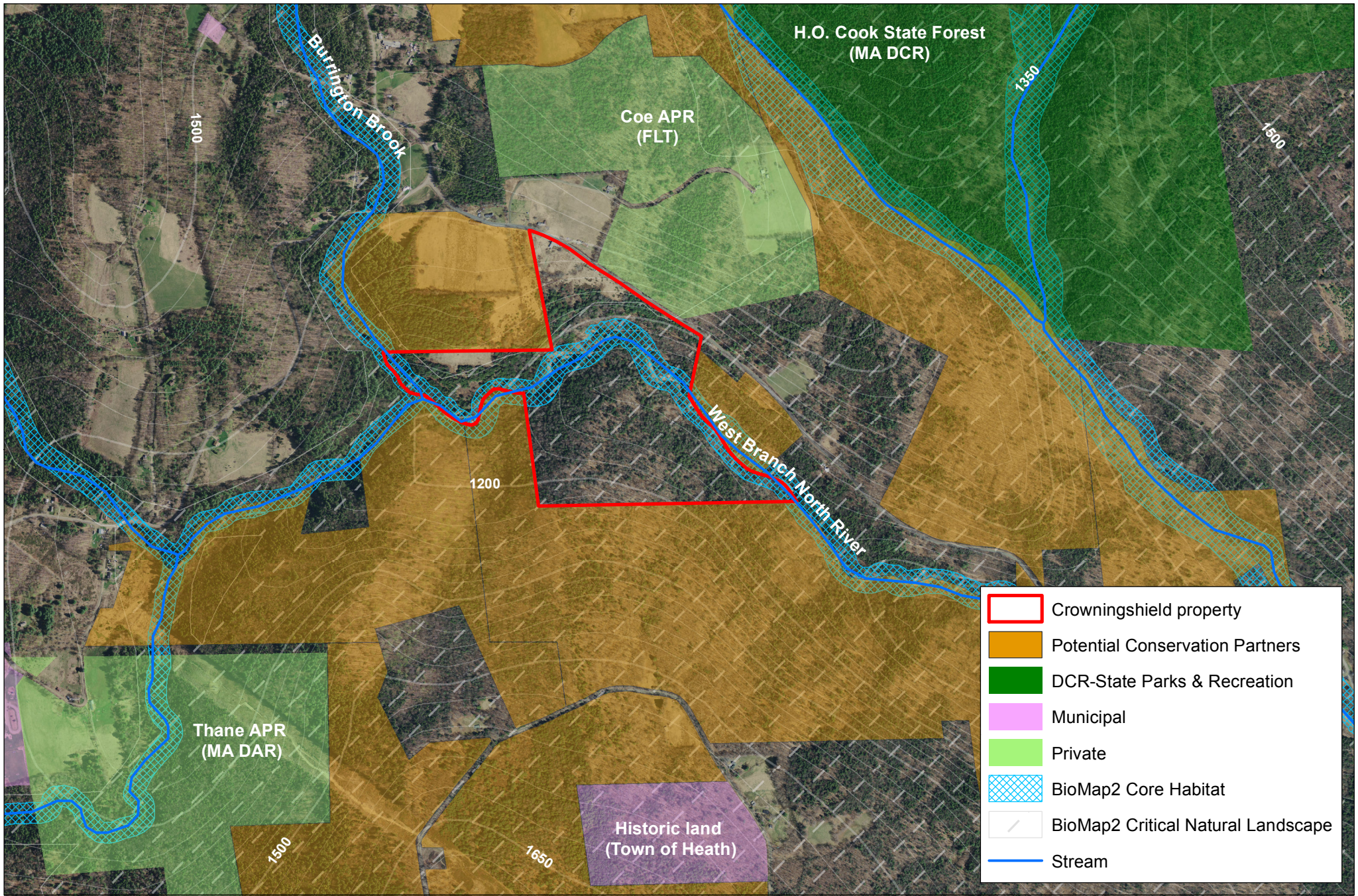
### Trustees

- **Kai Anderson, Washington, DC.** 4 yrs. Co-Chairman, Cassidy & Associates.
- **Nick Babson, Chicago, IL.** 2 yrs. President of NCB Ventures LLC, a private family office and investment management company.
- **John Braico, Queensbury, NY.** 3 yrs. Founder of the TU Adirondack Chapter in 1984. Co-authored the NY State Stream Assessment Manual in 2002. Received the NY Chapter of American Fisheries Society Conservation Award (2009)
- **Sherry Brainerd, Rancho Santa Fe, CA.** 1 yr. Vice President and Director of the Brainerd Foundation.
- **Charlie Breithaupt, Clayton, GA.** 3 yrs. Longtime TU leader in GA. Instrumental in creating GA Trout Camp. Received TU National Youth Leadership Award in 2007. Awarded TU National State Council Award in 2010.
- **Stoney Burke, Ketchum, ID.** 3 yrs. Director for Sun Valley Office of Hall and Hall. Licensed real estate broker in ID, MT and OR.
- **Valerie Colas-Ohrstrom, New York, New York.** 4 yrs. Member of the Advisory Council of the American Museum of Natural History, Center for Biodiversity and Conservation.
- **Mike Dombeck, Stevens Point, WI.** 4 yrs. Served as both the Director of the Bureau of Land Management and the Chief of the US Forest Service. Currently, a professor of Global Conservation at University of Wisconsin.
- **Bill Egan, Jackson, WY.** 8 yrs. Serves as the Managing Director of Huckleberry Partners LLC and Eganvale LLC, a Director of Matrixx Initiative Inc. and is the Lead Director for WorldCast Anglers LLC.
- **Scott Hood, Broken Arrow, OK.** 2 yrs. President and Co-owner of Cosec International Inc.
- **Richard Johnson, Wilmington, NC.** 4 yrs. Founder & former CEO of HotJobs.com. In 2009 Mr. Johnson founded Masonboro.org.
- **Howard Kern, Westlake Village, CA.** 3 yrs. Worked in the financial services industry for over 20 years. Active TU member since 1989. Named National Conservation Hero of the Year in 2009 by Field and Stream magazine.
- **Nancy Mackinnon, Manchester Center, VT.** 5 yrs. A former vice president and 27-year veteran of The Nature Conservancy.
- **Walt Minnick, Boise, ID.** 4 yrs. Co-founder of The Majority Group, a bi-partisan government affairs and strategic consulting firm based in Washington, D.C. Represented Idaho's 1st Congressional District in U.S. House of Representatives.
- **Dan Needham, Chicago, IL.** 3 yrs. Managing Director of the Lotos Groupe, based in Chicago, IL.
- **Ken Olivier, San Francisco, CA.** 3 yrs. Chairman Emeritus of Dodge & Cox Funds.
- **Dan Plummer, East Branch, NY.** 1 yr. Vice President of the Code Blue Foundation, Trustee of the Summit Charitable Foundation, and Chairman of the Board for Friends of the Upper Delaware River.
- **Kevin Reilly, Santa Fe, NM.** 5 yrs. Served as Director of the Civil Litigation Division of the New Mexico Attorney General's Office and as managing lawyer for his law firm.
- **Thomas Stoddard, London, England.** 3 yrs. Group Chief Financial Officer and board member for Aviva plc. Prior to, he served as Senior Managing Director of Blackstone Advisory Partners LP.
- **Steve Strandberg, San Francisco, CA.** 5 yrs. Founder and Managing Director of WestBridge Ventures in San Francisco.
- **Mark Taylor, Tulalip, CA.** 1 yr. Has served TU in various capacities both locally and statewide. In 2009, Mark was honored as a Field and Stream Conservation Hero, and in 2013 he was awarded TU's Betty Winn Memorial for Sea-Run Fisheries Award.
- **Raiford Trask, Wilmington, NC.** 1 yr. President of Trask Land Company and Vice President of Autumn Hall, Inc. Serves as a member of the UNC Board of Governors.
- **Dan Vermillion, Livingston, MT.** 3 yrs. Co-founder of Sweetwater Travel with his brothers Jeff and Pat Vermillion. Dan serves on the Montana Fish, Wildlife and Parks Commission.
- **Jim Walker, Scottsdale, AZ.** 2 yrs. Principal of Walker Business Consulting, LLC. An executive leader with over 35 years of community and management achievements.
- **John Willis, Chicago, IL.** 4 yrs. Retired Managing Partner and Co- Founder of Willis Stein & Partners, a private equity firm. Formerly President of Continental Illinois Venture Capital Corporation.

# North River Watershed within the Deerfield River Basin





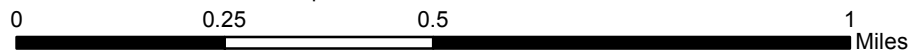


## CROWNINGSHIELD PILOT PROJECT AREA

Heath, MA

Sources: NHESP BioMap2, USGS 30' contours, 2015 orthoimagery. Boundaries are approximate.

Map Date: 04/22/2015 E. Johnson







P.O. Box 450  
Shelburne Falls, MA 01370  
phone: (413) 625-9151  
fax: (413) 625-9153  
[www.franklinlandtrust.org](http://www.franklinlandtrust.org)

**Officers:**

Paul Cooper, President  
(Hawley)  
Thomas Luck, Vice President  
(Leyden)  
Olie Thorp, Treasurer  
(Ashfield)  
Norma Coli, Clerk  
(Charlemont)

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Tony Borton (Conway)  
Jan Carr (Heath)  
Nina Coler (Ashfield)  
Ruah Donnelly (Conway)  
Michael McCusker (Buckland)  
Jaap Molenaar (Deerfield)  
Alan Swedlund (Deerfield)

**Staff:**

Richard Hubbard  
Executive Director  
  
Linda Alvord  
Membership Services  
William Sloan Anderson  
Chief Land Steward  
Emily Boss  
Land Protection Specialist  
Wendy Sweetser Ferris  
Director of Community Outreach  
Emily Johnson  
Land Steward  
Joshua Morse  
Land Steward  
Alain Peteroy  
Director of Land Conservation  
Mary Lynn Sabourin  
Director of Development

April 24, 2015

Darren Long  
Wildlife Conservation Society  
750 9<sup>th</sup> Street NW, Suite 525  
Washington, DC 20001

**RE: Climate Adaptation Grant**

Dear Mr. Long,

The Franklin Land Trust (FLT) is pleased to work with Trout Unlimited and the Massachusetts Woodlands Institute (a subsidiary of FLT) to assist in the Wildlife Conservation Society's Climate Adaptation Grant. The proposed project will enhance stream connectivity in the North River Subwatershed of the Deerfield River Basin. This area provides refuge habitat for cold water fish such as native brook trout. These fish are experiencing habitat loss at an alarming rate. In addition, it will create a set of prescriptions for land management in the vicinity of cold water streams that will help our conservation partners maintain and improve conditions for these fish in a time of changing climate conditions and increased stress on the landscape.

Founded in 1987, the Franklin Land Trust is a 501(c)(3) non-profit land conservation organization with a mission to conserve the environment and character of the working landscapes of Massachusetts, including conserving and enhancing forest resources and fostering natural resource based community economic development. We are very happy to partner with Trout Unlimited which is working to conserve, protect and restore coldwater fisheries in New England's watersheds. We believe that by establishing this model, we will help create a tool which can be adapted across the North East, and across the country.

We encourage you to approve and fund the Wildlife Conservation Society's Climate Adaptation Grant. Thank you for your consideration.

Best regards,

Richard Hubbard  
Executive Director



Massachusetts  
**Woodlands Institute**

P. O. Box 450, Shelburne Falls, MA 01370 413-834-4310 [masswoodlandsinstitute.org](http://masswoodlandsinstitute.org)

July 15, 2015

Wildlife Conservation Society  
ATTN: Darren Long  
750 9th Street NW, Suite 525  
Washington, DC 20001

RE: Climate Adaptation Grant

Dear Mr. Comfort,

The Massachusetts Woodlands Institute is very happy to partner with Trout Unlimited in the *Building Capacity on the North River: A multi-system approach to improve adaptive capacity of riparian areas and cold water streams vulnerable to projected climate change* project. The proposed project will revitalize native fisheries stream connectivity by addressing limitations of ancient culverts with innovative solutions, and provide forward-looking forestry prescriptions for land management to forest landowners in our region that integrate the needs of precious cold-water fish with challenges posed by climate change.

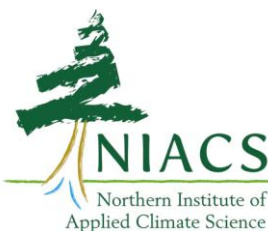
Founded in 2001, the Massachusetts Woodlands Institute is a non-profit 501(C)(3) corporation with a mission maintain the environment and character of the woodlands of Massachusetts, conserve and enhance forest resources, and foster community economic development. In 2014, MA Woodlands Institute became a subsidiary of the Franklin Land Trust. Massachusetts Woodlands Institute was instrumental in exporting Foresters for the Birds to Massachusetts from Vermont where it was launched.

We see this project as an important opportunity to use the strengths of our organizations together in order to address the interdependent nature forest and stream ecology. Just as managing forests with birds in mind attracts the positive attention of landowners, so too do we see fisheries as a critical avenue for motivating landowners and communities to become engaged with the landscape.

We hope that you will fund the *Building Capacity on the North River* project. We are grateful for the opportunity that this Conservation Innovation Grant offers for these organizations to provide critical connectivity for native fisheries, and to establish important new opportunities for habitat enhancement, education and outreach.

Best regards,

Emily Boss, Director  
Massachusetts Woodlands Institute



**Maria Janowiak**

Northern Institute of Applied Climate Science  
US Forest Service, 410 MacInnes Drive, Houghton MI 49931  
906-482-6303 Ext. 29 | [mjanowiak02@fs.fed.us](mailto:mjanowiak02@fs.fed.us)

[www.nrs.fs.fed.us/niacs](http://www.nrs.fs.fed.us/niacs)

July 16, 2015

Mr. Darren Long  
Wildlife Conservation Society  
750 9<sup>th</sup> St. NW, Suite 525  
Washington, D.C. 20001

Dear Mr. Long:

The Northern Institute of Applied Climate Science (NIACS) is pleased to support and collaborate in the proposed “Building Capacity on the North River: A multi-system approach to improve adaptive capacity of riparian areas and coldwater streams vulnerable to projected climate change” submitted by Trout Unlimited to the Climate Adaptation Fund.

Trout Unlimited has a critical role in the work to reconnect and restore waterways across New England. Warmer temperatures, extreme storms, flooding, and other climate change impacts only increase the need for actions that improve the ability of forests, waterways, and infrastructure to accommodate these changes while also maintaining diverse wildlife habitats. The proposed project reaches across disciplines to place aquatic organisms within the context of their broader watershed and address climate change impacts at a landscape scale. This provides an opportunity to engage a much wider audience of municipalities, natural resource professionals, land owners, and members of the public in conversations about how to best adapt these ecosystems to changing conditions.

NIACS supports the integration of climate change considerations into forest conservation and management activities. Through the Climate Change Response Framework, we have developed *Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers* and an associated adaptation workbook that enable natural resource professionals to design and implement adaptation actions. This has resulted in dozens of real-world adaptation demonstration projects that have used our approach, including the proposed project in the North River watershed.

NIACS is committed to providing support to ensure the success of this project. Specifically, NIACS will provide scientific expertise and technical assistance related to forests, watersheds, and climate change during project implementation. NIACS will also participate in the development and deployment of the toolkit, workshops, and other communications efforts. Lastly, NIACS will carry the project’s story and lessons learned to its own networks of natural resource professionals. We are enthusiastic about the proposed project and look forward to participating as it progresses.

Sincerely,

Maria Janowiak  
Scientist, Climate Change Adaptation and Carbon Management  
Northern Institute of Applied Climate Science & US Forest Service