

**Finger Lakes Partnership for Regional Invasives Species Management  
Subcontracts Program to Deliver Scope of Work RFP – September 1, 2014**

**Expanding Hemlock Woolly Adelgid Monitoring in the Finger Lakes Region of Central  
New York**

**Project Leader:**

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**Collaborators:**

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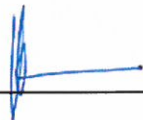
**Total amount requested: \$6000.00**

**Institutional Signatures:**



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David Skeval, Executive Director  
CCE Onondaga  
The Atrium, 2 Clinton Square Suite 170  
Syracuse, NY 13202



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Mark Whitmore  
Forest Entomologist, Department of Natural Resource  
Cornell University  
106 Fernow Hall, Ithaca, NY 14853

## **Project summary**

Eastern hemlock, *Tsuga canadensis*, is an important foundation species along the gorges and streams in the Finger Lakes region of Central New York State. With its dense canopy and acidic foliage, hemlock forests create a habitat that harbors a unique assemblage of plants (D'Amato et al. 2009) and animals (Snyder et al. 2002, Tingley et al. 2002). Hemlock forests also have a high aesthetic value in the NY State Parks, Finger Lakes National Forest and other recreational venues throughout the Finger Lakes region.

The Hemlock Woolly Adelgid (HWA), *Adelges tsugae*, is a tiny, aphid-like insect that was introduced into the Eastern US in the mid 1950's from Japan (McClure 1996). Since that time it has caused extensive hemlock mortality and spread throughout the southern range of Eastern and Carolina hemlocks in the Appalachian Mountains and north into southern Vermont, New Hampshire, and Maine (Elkinton, pers. comm. 2012). HWA was first detected in the Finger Lakes in 2008 and has been rapidly spreading (Whitmore 2010).

Most recently, HWA has been discovered along the south shoreline of Skaneateles Lake. Hemlock lines the shores and steep gorges here, providing bank stabilization, shade and temperature mediation, wildlife habitat and other ecosystem benefits to Syracuse's unfiltered water supply. Finger Lakes Land Trust has two preserves in this area: Bahar Nature Preserve and Hinchcliff Family Preserve. HWA was confirmed at Bahar in June 2014. While the infestation at Hinchcliff has not yet been confirmed, HWA was confirmed on abutting private lands in June and July of 2014. Within the Central New York region, New York State Parks has hemlock stands at risk at Green Lakes State Park and Clark Reservation. Of the NYS Parks that are already infested, Fillmore Glen State Park is just 10 miles from the Skaneateles Lake Watershed and 26 miles to Clark Reservation (as the crow flies).

Land managers for these organizations are concerned by the potential impacts of HWA and are currently formulating and implementing management strategies. Previous work by Mark Whitmore of Cornell University has established long-term monitoring plots in the Finger Lakes region to track changes in HWA populations and canopy cover at Robert Treman State Park, Taughannock State Park, and Watkins Glen State Park, as well as a number of Cornell Natural Areas. There is need for more monitoring in new areas of infestation and areas at risk for HWA.

This proposed research project would establish additional long-term monitoring plots in key hemlock stands in the Finger Lakes PRISM region in cooperation with their respective land managers. The objective for establishing these plots would be to monitor tree health and HWA population growth to better understand the factors affecting this pest over time. The information will also be invaluable to land managers in evaluating the efficacy of their HWA management activities so they can rapidly adapt their programs to changes.

The project will also have an outreach component, encompassing two winter hikes with local "citizen scientists" to train private landowners and public recreationalists to look for HWA on their property and report their findings through the iMap Invasives web site.

The project supports the mission of the FL-PRISM as it uses applied research methods to increase knowledge, inform management activities, and reduce the spread and impacts of hemlock woolly adelgid in the Finger Lakes region. This project also includes an outreach

## **Expanding Hemlock Woolly Adelgid Monitoring in the Finger Lakes Region of Central New York**

component to educate landowners and the general public about identification and reporting on HWA.

Establishment of these long-term monitoring plots will create a foundation for further research at these locations beyond tree health and HWA intensity. Other HWA long-term monitoring locations across the state follow the USFS FIA long-term monitoring protocols, which includes additional information about vegetation composition and density.

### **Scope of Work**

This project will establish at least 12 permanent monitoring plots for HWA on four properties in the FL-PRISM region. Plots will be located along transects allowing investigation of the effect of elevation and slope aspect within each site as allowed by the topography. Three to four plots will be located at each site. Final plot locations and quantity will be dependent upon conditions at each site.

CCE Onondaga staff will place permanent plot markers at each plot, locate each plot with GPS and take hemispherical photographs during the fall and winter of 2014-2015. Specialized software will be used to analyze the photographs. The data collected will be analyzed on an annual basis as part of Cornell University's long term monitoring of hemlock tree health, and of development of HWA populations over time.

### **Timeframe**

The project period will be October 1, 2014 – February 16, 2015.

- |                             |   |
|-----------------------------|---|
| October 2014                | <ul style="list-style-type: none"><li>• Finalize permissions to access properties with State Parks and Finger Lakes Land Trust</li><li>• Purchase expendable supplies</li><li>• Purchase software</li></ul> |
| November – December 2014    | <ul style="list-style-type: none"><li>• Establish plots</li><li>• Take hemispherical photos</li><li>• Provide photos to Cornell University for analysis</li></ul>   |
| January – February 16, 2014 | <ul style="list-style-type: none"><li>• Schedule and deliver two monitoring hikes for private landowners</li></ul>  |

### **Personnel and collaborations**

Mark Whitmore, Forest Entomologist at Cornell University, currently receives funding through the US Forest Service in collaboration with NYS Parks, NYS DEC and Cornell University to monitor hemlock woolly adelgid and establish biological controls in a variety of locations across New York State, including Robert Treman State Park and Watkins Glen State Park located in the Finger Lakes region. Mark's research will benefit by expanding HWA monitoring and biological control studies into areas of new infestation and hemlock stands at risk of infestation. Mark will provide the technical information and research protocols necessary to establish and monitor plots, as well as specialized equipment that will be loaned for this project.

## **Expanding Hemlock Woolly Adelgid Monitoring in the Finger Lakes Region of Central New York**

Mark Whitmore has a long history as a collaborator with CCE Onondaga's invasive pest programming, and assisted with a HWA hike in the Skaneateles Lake Watershed in 2011. An essential member of the Onondaga County EAB Task Force, Mark's willingness to work with CCE and other partners has greatly increased capacity to deliver informative invasive species programs to communities affected by HWA and EAB.

CCE Onondaga currently works to provide natural resource education throughout Onondaga County with an emphasis on stewardship and invasive species. CCE receives special funding from the City of Syracuse to educate residents in the Skaneateles Lake Watershed about best management practices to maintain the pristine water quality in Skaneateles Lake. This effort helps Syracuse to continue using Skaneateles Lake as an unfiltered water supply for the city. With HWA infestations now well-established along the Skaneateles Lake shorelines, and the fragile soils and ecosystems of these areas at risk from loss of those hemlock, CCE Onondaga seeks to assist with research, outreach and education for residents and land managers to be able to control HWA and preserve the ecological integrity of the Skaneateles Lake Watershed, and other fragile areas in the region containing hemlock.

CCE Onondaga also offers a Master Watershed Steward (MWS) program. CCE staff and Cornell faculty train volunteers to understand and address a wide range of watershed stewardship issues ranging from invasives species control, watershed planning, grant funding, and community organizing. The MWS volunteers will be assisting with data collection efforts and outreach workshops under the supervision of CCE staff for this project. CCE Onondaga will build on its other strong collaborative partnerships with researchers, agencies and community organizations to deliver this project.

### **Project Locations**

The project will take place on four properties in the FL-PRISM region.

- Bahar Preserve, Town of Niles in Cayuga County – owned by Finger Lakes Land Trust
- Clark Reservation, Town of Jamesville in Onondaga County – New York State Parks
- Green Lakes State Park – Town of Fayetteville in Onondaga County – New York State Parks
- Hinchcliff Family Preserve, Town of Spafford in Onondaga County – owned by Finger lakes Land Trust

## Expanding Hemlock Woolly Adelgid Monitoring in the Finger Lakes Region of Central New York

### Personnel and Partners

#### *Personnel*

**Kristina Ferrare.** Forestry Resource Educator, CCE Onondaga. Kristina Ferrare holds an MS in Forest Resources Management from the University of Massachusetts and a BS in History from Hamilton College. Her graduate work focused on developing a data management and reporting system to evaluate best management practices on timber sales for the USDA Forest Service. Before coming to CCE, Kristina worked on private forest landowner outreach and education as well as land conservation programming for the University of New Hampshire Cooperative Extension. She is a native of Central New York.

Contact: The Atrium, 2 Clinton Square, Suite 170, Syracuse, NY 13202. (315) 424-9485 ext. 231. [Kaf226@cornell.edu](mailto:Kaf226@cornell.edu).

**Jessi Lyons.** Team Coordinator, Natural Resources, CCE Onondaga. Jessi coordinates natural resource programs at CCE Onondaga, including a variety of programs involving invasive species education and outreach. Prior to moving to New York, Jessi spent six years conducting forest ecology research and invasive species management for the USDA Forest Service, the National Park Service and University of Kentucky. She has an MLA from SUNY ESF and a BS in Environmental Studies from Southern Oregon University.

Contact: The Atrium, 2 Clinton Square, Suite 170, Syracuse, NY 13202. (315) 424-9485 ext. 233. [jel264@cornell.edu](mailto:jel264@cornell.edu).

**Mark Whitmore.** Forest Entomologist, Department of Natural Resources, Cornell University. Mark works with professional land managers, state and federal agencies, government officials, and concerned citizens to understand the issues and strategies for minimizing the impact of forest insect pests, and in particular non-native invasive insects. He currently conducts hemlock woolly adelgid research in the Finger Lakes in cooperation with NYS Parks, NYS DEC and the USDA Forest Service. He has a MS from University of Washington and a BS of Western Washington University.

Contact: 106 Fernow Hall, Ithaca, NY 14853. (607) 280-4064. [Mark.Whitmore@cornell.edu](mailto:Mark.Whitmore@cornell.edu)

#### *Partners*

New York State Parks and Finger Lakes Land Trust are landowners with infested hemlock stands or stands at risk of infestation. CCE Onondaga will locate monitoring sites at two New York State Parks and two Finger Lakes Land Trust locations. Data collected and analyzed will be shared with these partners to inform future management planning, as well as other agencies and organizations such as the USDA Forest Service and the NYS DEC as we seek to expand research and programming through additional funding opportunities.

## **Expanding Hemlock Woolly Adelgid Monitoring in the Finger Lakes Region of Central New York**

CCE Onondaga currently works with NYS Parks through the Onondaga County EAB Task Force, and informal project collaborations such as invasive plant pulling events, native plant education, and offering invasive species education at the New York State Fair at the NYS Parks Natural Resource Stewardship tent. CCE will offer all research results to NYS Parks and will lead at least one of the citizen science monitoring training workshops at one of the NYS Park monitoring sites.

CCE Onondaga partners with the Finger Lakes Land Trust (FLLT) to provide land conservation planning education through workshop such as farmland legacy planning and succession planning with forest landowners. CCE's Master Watershed Steward Volunteers have chosen to complete stewardship projects on FLLT sites or to the benefit of FLLT. CCE will offer all research results to FLLT, and may offer a citizen science monitoring training workshop at one of FLLT monitoring sites.

CCE Onondaga works closely with the Skaneateles Lake Association (SLA), Otisco Lake Preservation Association (OLPA) and other community organizations involved in environmental stewardship activities. CCE currently helps to train the SLA Boat Stewards and OLPA volunteers in aquatic plant and animal identification and monitoring protocols. CCE will continue to work with these groups to recruit residents in the Finger Lakes watersheds to attend citizen science training events and begin HWA monitoring.

## Expanding Hemlock Woolly Adelgid Monitoring in the Finger Lakes Region of Central New York

### Budget and Justification

#### A. *Labor costs*

Kristina Ferrare and Jessi Lyons will be responsible for finalizing permissions and access to properties with NYS Parks and Finger Lakes Land Trust, coordinating plot establishment and site selection, purchasing supplies and software, monitoring plots, coordinating and leading citizen science monitoring hikes, and grant administration.

Kristina Ferrare, Forestry Educator: 02 FTE = \$850

Jessi Lyons, Natural Resources Team Coordinator: 0.025 FTE = \$1330

Total = \$2180

#### B. *Fringe benefits*

Fringe benefits are covered through other sources.

#### C. *Expendable supplies*

Rebar, rebar caps, and compasses = \$206

All other data collection and survey equipment has been acquired through CCE Onondaga or Mark Whitmore.

#### D. *Travel/Transportation*

CCE Onondaga uses the federal mileage rate of \$0.56/mile. Travel will be necessary to transport the camera and monitoring equipment from Mark Whitmore, travel to monitoring plots, and travel to Hemlock Hike workshops. We estimate at least 535 miles of travel at  $\$0.56 = \$300$

#### E. *Office Support and Miscellaneous*

An essential component to assess impacts from hemlock woolly adelgid and future treatment efficacy is the quantification of hemlock canopy over time. Hemispherical photography is a standard method to quantify canopy. Mark Whitmore currently uses a high quality professional camera set-up to take photos, but lacks adequate software to evaluate the photographs. The software currently used for similar hemlock canopy assessment is WinSCANOPY. The software is estimated to cost \$2300. An additional license may be necessary in order for the software to be shared by CCE Onondaga and Mark Whitmore.

WinSCANOPY Software = \$2300

License fee = \$100

Total = \$2400

#### F. *Indirect cost*

CCE Onondaga requires 18% indirect cost.

18% of \$5086 = \$914.

## Expanding Hemlock Woolly Adelgid Monitoring in the Finger Lakes Region of Central New York

<b>Proposal Budget Template</b>	
Project Title:	Expanded Hemlock Woolly Adelgid Monitoring in the Finger Lakes region of Central New York
Sponsor/Institution:	Cornell Cooperative Extension of Onondaga County
PI:	Kristina Ferrare
Period of Performance for Project:	Oct 1, 2014 – Feb 16, 2015
(add columns for additional years as needed)	
<b>BUDGET</b>	
<b>LABOR COSTS</b>	
<b>Personnel</b>	
Salaries	\$2180
Fringe on salaries	N/A -
<b>Total Salaries, Wages + Fringe</b>	<b>\$2180</b>
Expendable Supplies *	\$206
Travel	\$300
Office Support and Miscellaneous	\$2400
Equipment**	
<b>Total Direct Cost</b>	<b>5086 -</b>
<b>Indirect Costs</b>	<b>914 -</b>
<b>Total Request to Sponsor</b>	<b>\$6000</b>





Cornell University  
College of Agriculture and Life Sciences  
Department of Natural Resources

11 September 2014

Hilary Mosher  
Finger Lakes PRISM  
300 Pulteney Street  
Geneva, NY 14456

Dear Hilary:

I am writing to wholeheartedly support the proposal "Expanding Hemlock Woolly Adelgid Monitoring in the Finger Lakes Region of Central New York" by Cornell Cooperative Extension of Onondaga County.

This work would complement my work to implement efficacious control tactics for the Hemlock Woolly Adelgid. It is critical that we identify high value hemlock stands in our region and take baseline data in order to evaluate the impact of this destructive insect and the efficacy of our management tactics. Data collected in this project will be similar to that compiled by my project and will be an important part of the state-wide effort to implement effective management. I plan to work closely with this project to be sure they have all the necessary equipment and expertise to carry out the work outlined in their proposal.

Best regards,

A handwritten signature in blue ink, consisting of a vertical line on the left and a horizontal line extending to the right.

Mark Whitmore  
Forest Entomologist  
Department of Natural Resources  
Cornell University  
Ithaca, NY 14853



# Finger Lakes Land Trust

202 East Court Street  
Ithaca, New York 14850  
Tel: (607) 275-9487 / Fax: (607) 275-0037

*. . . working to protect the natural integrity of the Finger Lakes Region.*

September 12, 2014

Hilary Mosher  
Finger Lakes PRISM  
300 Pulteney Street  
Geneva, NY 14456

Dear Hilary;

I am writing to express the support of the Finger Lakes Land Trust (FLLT) for funding by the Finger Lakes Partnership for Regional Invasive Species Management (PRISM) that may support research by Cornell Cooperative Extension of Onondaga County on the spread of the non-native hemlock woolly adelgid (HWA) insects, and associated possible decline in health of eastern hemlock trees, in the Skaneateles Lake watershed.

The Skaneateles Lake watershed is an important land conservation priority area of FLLT within the larger Finger Lakes region, and own and manage four nature preserves at the south end of the lake (and have helped conserve other lands in the watershed as well). From the shore of the lake, rising up through many gorges, and even at the summit of Ripley Hill – highest point in Onondaga County – there are beautiful eastern hemlock trees to help define the character of these natural places. And they are now under serious threat. A few years ago we looked for HWA at our Bahar Nature Preserve and adjacent Carpenters Falls Unique Area and did not find it, but now it is present there and we fear it is expanding rapidly.

Anything we can do to increase our knowledge of where and how fast HWA is spreading in the area, and what impacts it is having on the hemlock trees, will benefit our ability to manage our preserves, plan an HWA control strategy, and hopefully save some of our magnificent hemlocks. We have worked very closely with Cornell University Forest Entomologist Mark Whitmore to plan and conduct chemical treatments of hemlock trees against HWA and releases of biological control beetles in the Cayuga Lake watershed, and we expect to do similar work in the Skaneateles Lake watershed in the near term. If research funding can be provided to Cornell Cooperative Extension of Onondaga County, FLLT would be more than willing to make one or more of our nature preserves available for research plots.

Thank you very much for considering this letter of support, and for all that you do to support efforts in increasing awareness and control of many non-native invasive species.

Sincerely,

Chris Olney, Director of Stewardship