Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-205

Proposal Title: Impacts of Tree Removals and Replanting for Residents

Project Manager Information

Name: Alicia Coleman

Organization: U of MN - College of Food, Agricultural and Natural Resource Sciences

Office Telephone: (732) 674-8204

Email: aliciac@umn.edu

Project Basic Information

Project Summary: This project evaluates the impact of large-scale tree removals on residents in Minnesota cities, assessing changes in nature's benefits and supporting workshops to improve urban reforestation.

ENRTF Funds Requested: $467,000

Proposed Project Completion: June 30, 2028

LCCMR Funding Category: Resiliency (A)

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Insects and diseases are increasingly threatening urban tree and forest health. Dutch elm disease and emerald ash borer (EAB) have dramatically changed urban forests in Minnesota, with ongoing impacts from EAB. New pests like Asian longhorned beetle (ALB), are affecting maple trees in urban forests of Northeastern states and may have significant future impacts on Minnesota's urban forests.

Urban forests provide many benefits to people, but pests and diseases can diminish these benefits. When invasive pests and diseases damage individual urban trees, they alter the forest's density, species composition, age distribution, and overall health. These changes reduce the forest's ability to provide critical services such as air purification, stormwater mitigation, carbon storage, and urban cooling. As a result, urban areas may experience reduced environmental quality and resilience.

There is an urgent need to better understand how to maximize the benefits of urban forests to people in light of the negative impacts of invasive pests and diseases. Better data will facilitate improved community planning for the future.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

This project introduces a new approach to quantify and value local environmental benefits lost to pest-driven urban tree removals and to optimize tree replanting in consultation with natural resource managers. We will recruit at least 10 municipal urban forest managers and interested stakeholders from large and mid-sized Minnesotan cities that are at various stages of EAB exposure and management. We will hold initial workshops with stakeholders to understand local values and threats posed by EAB and other pests and diseases.

We will then use the decision support tool Urban InVEST to quantify environmental benefits and estimate the effects of tree removal on urban cooling, carbon storage, and stormwater management. This analysis will quantify changes before and after tree removal, as well as new benefits that can be achieved through various replanting scenarios. An assessment across neighborhoods of the same city will also evaluate and visualize local impacts and assist community level planning.

At the end of the project, we propose to reconvene municipal urban forest managers and interested stakeholders. A business communications approach called strategic foresight will be used to facilitate realistic conversations about future urban forest management scenarios and provide an opportunity for managers to learn from peer municipalities.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

This project will support the protection, conservation, preservation, and enhancement of Minnesota's urban forests by:
- Assessing the impacts of invasive pest-driven tree removals and replanting efforts,
- Quantifying losses of environmental benefits (urban cooling, carbon storage, stormwater regulation) and modeling benefits of future replanting scenarios,
- Prioritizing spatial locations to focus replanting efforts, mitigate the effects of tree loss, and enhance urban resilience,
- Synthesizing actionable data to strategically guide sustainable urban forestry management,
- Contributing to long-term forest health and climate adaptation strategies, ensuring that urban tree cover continues to provide environmental and community benefits across Minnesota.

Activities and Milestones

Activity 1: Conduct an academic literature review to determine lessons learned from large-scale urban tree removal

Activity Budget: $85,250

Activity Description:
This literature review will analyze academic and grey literature to assess the prevalence and drivers of large-scale urban tree removals in U.S. cities, with a focus on the implications for Minnesota. The review will examine the types of cities affected, motivations for tree removal, and case studies of significant removal events, particularly pest-driven tree removals and their relevance to other cities.

Key tasks include identifying the underlying causes of urban tree removals (e.g., pests, disease, development pressures, climate change impacts), assessments of valuation or loss of tree removals, city-scale variations in response strategies, and best practices for mitigation. The Project Lead will work with two Graduate Research Assistants and the UMN libraries to develop the literature review strategy and all Project Co-Leads will contribute to the synthesis and provide guidance on mitigating the impact of tree removals and implementing effective tree replanting strategies.

The findings of this review will be presented to stakeholders during a mid-project virtual workshop in order to share lessons learned from previous cases, highlighting best practices, and outlining policy recommendations for sustainable urban tree management. The review will contribute to a broader understanding of urban forest resilience and inform future tree conservation efforts.

Activity Milestones:

Description	Approximate Completion Date
Hire graduate research assistants	July 31, 2026
Prepare presentation to stakeholders on key findings and implications	July 31, 2026
Conduct initial literature review and identify key sources	August 31, 2026
Complete review of case studies and assess relevance to other cities	December 31, 2026
Finalize and submit review paper for peer-review publication	June 30, 2028

Activity 2: Determining Study Areas and Collecting Data for Urban Tree Removal and RePlanting

Activity Budget: $96,983

Activity Description:
This activity will identify study areas and gather data to assess urban tree removals and plantings in Minnesota's major cities. The team will engage with public and private urban tree managers across the state to introduce the project's goals and assess the availability of relevant records. The focus will be on mapping large-scale ash tree removals due to Emerald Ash Borer (EAB) infestations, particularly in northern Minnesota, using data from the Department of Natural Resources.

A minimum of 10 urban areas across the state will be recruited specifically from the northern, central, and southern parts of the state based on population density, projected population growth, and existing tree canopy cover. Areas of tree removals will be mapped alongside potential replaning sites using high-resolution (1m) land cover data, municipal tree inventories, and private tree care company data.

A workshop will be held with urban tree managers to refine study area selection, discuss the impacts of tree removals,

and align data collection with InVEST model requirements. We will also invite conversations about urban tree replanting that can be modeled as part of the reforestation scenarios.

Activity Milestones:

Description	Approximate Completion Date
Finalize study area selection (in northern, central, and southern MN) and and data collection approach	October 31, 2026
Conduct 3 workshops (in northern, central, and southern MN) with on project goals and data	January 31, 2027
Map ash tree removal patterns and potential replanting sites	July 31, 2027

Activity 3: Quantifying Ecosystem Services of Urban Tree Removals and Plantings

Activity Budget: $211,335

Activity Description:
Using InVEST model tools, we will estimate changes in urban cooling, carbon storage, and stormwater regulation before and after tree removals. We will also explore the benefits of various replanting strategies, considering species, tree size, and DBH influences. Beyond ash trees, we can also assess tree species vulnerable to the Asian longhorned beetle, including Sugar maple, American elm, and Quaking aspen, to guide future tree management decisions and enhance urban ecosystem resilience.

A key focus is neighborhood-level analysis, comparing the impacts of ash tree removals in areas such as Harrison and Bryn Mawr in Minneapolis. We will evaluate the effects of removing large contiguous blocks versus scattered individual trees to understand broader ecosystem service implications. Interactive data visualizations will make findings accessible to the public and planners, illustrating changes in urban forest benefits and helping prioritize replanting in areas that have been (and could be) affected by canopy loss.

Findings from this activity, alongside the conceptual framework from Activity 1, will support new approaches to data-driven urban forestry management. The results will inform strategies to mitigate tree loss while maximizing environmental and social benefits for Minnesota's urban residents.

Activity Milestones:

Description	Approximate Completion Date
Map ash tree removal patterns and potential replanting sites	July 31, 2027
Define tree removal and replanting scenarios based on workshop participant preferences	July 31, 2027
Quantify impacts of tree removal on urban cooling, carbon, and stormwater regulation	December 31, 2027
Compare impacts across neighborhoods, assessing block vs. scattered removals, and conduct distributional analysis	January 31, 2028
Create interactive visualizations to support public engagement and data-driven decision-making	March 31, 2028

Activity 4: Sharing results and discussing urban forest futures with natural resource managers

Activity Budget: $73,432

Activity Description:
Findings from Activities 1, 2 and 3 will be shared to participating cities and natural resource managers through a facilitated workshop. The workshop will report results of the ecosystem services assessments, including the services lost from urban tree removals as well as the benefits that can be achieved from the replanting scenarios discussed in Activity 2 and quantified in Activity 3.

The workshop will follow a structured decision making process called strategic foresight. Strategic foresight offers a new way to approach instances of uncertainty in urban natural resource management by offering explicit scenarios that can be discussed alongside visual data (from Activity 3) in order to co-produce actionable solutions. Participants will be assigned different tree replanting scenarios and tasked with developing strategies for realistic implementation. A facilitated discussion will uncover if certain management strategies are mentioned frequently and when each strategy may be advantageous to implement.

Activity Milestones:

Description	Approximate Completion Date
Organize and prepare workshop event	March 31, 2028
Host workshop for natural resource and urban forest managers	May 31, 2028
Ensure that interactive visualizations have a long term webhost	June 30, 2028

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Lingling Liu	Univeristy of Minnesota	Co-PI	Yes
Forrest Fleischman	University of Minnesota	Co-PI	Yes
Eric Lonsdorf	NatCapInsights	Co-PI	Yes

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?

The project's findings will be shared with urban forestry managers, policymakers, and community stakeholders to guide sustainable tree replanting and management strategies. Results will be disseminated through workshops, reports, and interactive data visualizations. Local governments, nonprofits, and state agencies can use this information to support tree-planting initiatives and ecosystem service restoration. Future work may include expanded modeling, monitoring, and implementation support, with potential funding from municipal budgets, state grants, federal programs, and private partnerships to ensure long-term urban forest resilience and ecosystem service delivery across Minnesota

Project Manager and Organization Qualifications

Project Manager Name: Alicia Coleman

Job Title: Assistant Professor of Urban and Community Forestry

Provide description of the project manager's qualifications to manage the proposed project.

Alicia Coleman was hired as a new assistant professor in the Department of Forest Resources in August 2023. Coleman's research expertise covers geospatial aspects of urban forestry programs, residents' preferences for trees on private property, and climate-adaptive urban tree selection. Her postdoctoral research helped the Connecticut Department of Energy and Environmental Protection assess the co- benefits and impacts of urban and community forestry grant funding.

Coleman has experience supervising dozens of undergraduate and graduate students during her PhD data collection at the University of Massachusetts and postdoctoral research at the University of Connecticut. She has experience training students to collect, clean, standardize, and analyze human subjects data, field data, and related attributes between digital mapping and other data analysis software.

Presently, Coleman is a member of four master's thesis committees. Coleman teaches two required courses in the Urban and Community Forestry track of the UMN Forest and Natural Resource Management undergraduate degree program and, in establishing these courses, has developed an expanding professional network of arboriculture, urban forestry, and Extension points-of-contact around the state.

Organization: U of MN - College of Food, Agricultural and Natural Resource Sciences

Organization Description:

The College of Food, Agricultural, and Natural Resource Sciences (CFANS) has twelve academic departments and ten research and outreach centers, alongside the Minnesota Landscape Arboretum, the Bell Museum, and many interdisciplinary centers. Within CFANS, the Department of Forest Resources has produced high quality research in natural resource management issues across the state of Minnesota, and the present undergraduate and graduate

education programs are consistently ranked among the top in the nation. For over 100 years, the department has been physically located on the St. Paul campus of UMN Twin Cities and will host this research project. Project Manager Coleman is affiliated with the Urban Forestry Outreach & Research (UFOR) lab, whose field nursery exists on the Minnesota Agricultural Experiment Station grounds. UFOR is located within the Department of Forest Resources and offers a variety of research, teaching, and outreach opportunities for university students and outreach education for professionals, volunteers, and interns. Staff, research assistants, and volunteers maintain the demonstration nursery and field based research projects. The UFOR nursery has also been used for teaching university students, Tree Care Advisors, Minnesota Tree Inspectors, and industry professionals.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
PD/PI		Activity 1 (Lead): Project deployment, literature review, and manuscript development; Activity 2 (Co-Lead): Communications with public and private urban forest managers to participate in the research and share data, support first series of workshops; Activity 4 (Co-Lead): Support second series of workshops			36.6%	0.26		$31,458
Co-Investigator (L. Liu)		Activity 1 (Co-lead): Conduct literature review and contribute to manuscript development; Activity 2 (Co-lead): Oversee and carry out data preparation, analysis, and mapping, and provide support for the workshop; Activity 3 (Lead): Lead and execute all five activities within this task; Activity 4 (Co-lead): Compile results in a structured format and support the workshop.			36.6%	2		$147,391
Co-Investigator (F. Fleischman)		Activity 1 (Co-lead): Conduct literature review and contribute to manuscript; Activity 2 and 4 (Co-lead): Compile information and results in a structured format and support the workshop.			36.6%	0.16		$36,134
Graduate Research Assistants (x2)		Activities 1, 2, 3, 4: Provide support to research staff to accomplish tasks for each activity, where 1 Graduate student will focus on data analytics (Activity 3) and the other student will focus on community engagement (Activities 2 and 4) and both will contribute to the literature review (Activity 1)			23.2%	4		$141,300
							Sub Total	**$356,283**
Contracts and Services								
NatCapInsights	Subaward	Dr. Eric Lonsdorf, lead consultant of NatCapInsights, is funded to co-lead Activity 2 (compile information and results in a structured format and support the workshop) and co-lead Activity 3 support all data analysis activities)				0.16		$31,364

							Sub Total	**$31,364**
Equipment, Tools, and Supplies								
	Tools and Supplies	Light refreshments	To distribute at 6 workshops ($200/ workshop)					$1,200
							Sub Total	**$1,200**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	6 trips, 1052 miles, 6 people, 0.26/mile	Minivan rental for 6 trips to greater MN					$658
							Sub Total	**$658**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
	Printing	Plotted maps, handouts	Printed materials for interactive workshop activities (for 6 total workshops)					$900
							Sub Total	**$900**
Other Expenses								
		Graduate Research Assistant Tutition	This is the required tutition rate for two UMN Graduate Research Assistants over 2 years					$75,395
		Short term space rental	Workshop space rental for 6 workshops ($200/ workshop)					$1,200

							Sub Total	**$76,595**
							Grand Total	**$467,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
In-Kind	Indirect Costs	Facilities and Administration Costs (54% Modified Total Direct Cost)	Secured	$211,467
			State Sub Total	**$211,467**
Non-State				
			Non State Sub Total	**-**
			Funds Total	**$211,467**

Total Project Cost: $678,467

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: fbe99a94-74c.pdf

Alternate Text for Visual Component

Better data will facilitate future of municipal urban forests and benefits received by residents. We can combine municipal tree inventory data with aerial tree canopy cover data to model: 1) the environmental benefits lost to EAB-driven tree removals and 2) local-level benefits of various tree replanting scenarios....

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
University of Minnesota Approval	479164a1-3bf.pdf
Saint Paul Support Letter	bd07eea5-51f.pdf
MSP-LTER Support Letter	b7d34a30-262.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I understand the UMN Policy on travel applies.

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

No

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing $10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care,

treatment, education, training, instruction, or recreation to children")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Rick Huisman, Fiscal Professional for the University of Minnesota

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

N/A