Environment and Natural Resources Trust Fund

2025 Request for Proposal

General Information

Proposal ID: 2025-295

Proposal Title: Trialing Climate-Ready Woodland Trees in Urban Areas

Project Manager Information

Name: Alicia Coleman

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

Office Telephone: ( ) -

Email: aliciac@umn.edu

Project Basic Information

Project Summary: This project studies climate-adaptive tree species performance across metropolitan areas of Minnesota. This project will recruit volunteers to collect data and will assess volunteers' risk tolerance of climate-adaptive tree species.

ENRTF Funds Requested: $255,000

Proposed Project Completion: June 30, 2027

LCCMR Funding Category: Foundational Natural Resource Data and Information (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.

A number of studies have revealed the ways in which global climate change will affect the forests and woodlands of Minnesota, and these researchers have published experimental protocols to further study how impacts in cities affect broader landscape changes over time (e.g. the North American Adaptive Silviculture for Climate Change, with experimental forest site in Saint Paul). This research has been used by expert groups, like UMN Extension, to develop lists of climate change-adapted tree species for a range of land managers to plant trees that are expected to grow and remain healthy in uncertain futures, including many non-invasive species native to the Southern United States. However, much of this work has not yet occurred in the context of city forests and metropolitan regions, and the survival of climate-adapted trees across core cities and metropolitan areas has not been critically studied. Given the complicated history of pests and pathogens in cities of Minnesota, we also have anecdotal evidence that land managers are resistant to planting too many unusual tree species. Communities of researchers and practitioners would benefit from an empirical understanding of perceived resilience and risk for large-scale tree planting decisions across different cities and urban ecosystems of Minnesota.

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.

We propose a structured series of tree planting trials for species carefully selected based on Minnesota's native plant community composition and projected climate suitability. These trials and demonstrations will help communities identify the species best suited to future urban and forest plantings. This proposal will build on several prior LCCMR investments (e.g. Peter Reich 2020-175e, Metro Blooms 2022-280) as well as new research-based lists of species to maintain productive, healthy, climate-ready woodlands. This proposal seeks to support research that assesses and monitors the dynamics of trees in smaller planting spaces of cities and metropolitan areas across Minnesota, as well as the perceptions towards these tree species by a range of land managers. We would like this research to begin while federal and state investments, as well as general support for the protection and enhancement of urban forest systems, are at an all time high. In 2024, a pilot study is being deployed on the University of Minnesota Saint Paul campus to plant 100 trees from the Climate-Ready Woodlands (CRW) planting list for the Minneapolis-Saint Paul region. We will also invite volunteers to inventory the presence and performance of the same species of trees existing in varying urban properties.

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?

The project outcomes and purposes relate to the protection, conservation, preservation, and enhancement of Minnesota's forest resources by:

- Understanding land and forest managers' risk tolerance for lesser known tree species and perceived impacts of tree stewardship
- Enhancing the species composition and resilience of urban forests across Minnesota by understanding of climate-adapted tree survival characteristics
- Creating an opportunity for participatory science that elevates the involvement and feedback loops between individuals, organizations, and forestry climate adaptation research

Activities and Milestones

Activity 1: Recruit Participatory Scientists (Individuals and Organizations) Across Multiple Cities and Ecoregions

Activity Budget: $37,922

Activity Description:
UMN Extension and UFOR have a broad network of natural resource audiences who are dedicated and familiar with this type of community discovery and are eager to apply it to monitoring the resilience of Minnesota's forests. We will establish monitoring plots through volunteer "participatory scientists", who will be recruited through our extensive professional and outreach networks to host trial tree plantings (Sample #1) and to provide data about these species that are already planted in the landscape (Sample #2).

We are deploying a 2024 pilot in the Minneapolis-Saint Paul region, and we aim to expand recruitment to additional urban areas across greater Minnesota - including cities like Moorhead, Rochester, Saint Cloud, Duluth, or Bemidji. Using the UMN Extension CRW planting lists recommendations and nursery stock availability, we will determine a subset of tree species for each of the 11 ecoregions across Minnesota that are most relevant for diverse cities, metropolitan areas, and ecosystems.

Activity Milestones:

Description	Approximate Completion Date
Refine data collection protocol	August 31, 2025
Determine subsets of tree species from Extensions' Climate Ready Woodlands lists	August 31, 2025
Establish locations for Sample #1 tree data	December 31, 2025
Establish locations for Sample #2 tree data	December 31, 2025

Activity 2: Collect Data And Quantify Climate-Adaptive Urban Tree Survival

Activity Budget: $175,656

Activity Description:
UMN Extension and UFOR have a long history of acquiring trees, collecting data, and monitoring trees across different places over time. We are developing a participatory science data collection app for this project, similar to projects like Terrestrial Invasive Participatory Science (TIPS: https://z.umn.edu/TIPSprojects).

Using the participatory science monitoring plots established in Activity 1, trees for Sample #1 will be acquired from local and national nurseries, and will be distributed through invited partner organizations to individuals and organizations that will volunteer to care for tree trials on their own properties. Data for Sample #2 will request volunteers and organizations to also map and monitor data about the selected species from trees that already exist on their properties across Minnesota. Data about tree growth, health, and other notable characteristics will be collected and analyzed twice per year through a combination of individual and group-based participatory science outreach as well as student and early career research technicians and professionals.

Activity Milestones:

Description	Approximate Completion Date
Hire and train a range of early career students and professionals to facilitate data collection	August 31, 2025
Maintain a robust participatory science network	June 30, 2026
Acquire and distribute trees for Sample #1	June 30, 2026

Collect Sample #1 & 2 Tree Data (round 1)	June 30, 2026
Collect Sample #1 & 2 Tree Data (round 2)	June 30, 2027

Activity 3: Describe Perceptions of Risk and Resilience: Field Tours and Narrative Interviews

Activity Budget: $41,422

Activity Description:
There is shared interest to plant climate-ready trees in communities across Minnesota, to monitor their health and performance through their post-planting establishment period, and to infer species mortality and survival based on the species characteristics, the biophysical environment, and social determinants of urban tree stewardship. To synthesize this greater need and broadly contextualize our project, UMN Extension will lead field tours in each participating region that will include a walking and/or driving tour to draw attention to the goals of this project and share initial results. Participants feedback will be documented and incorporated into research results.

Additionally, select volunteers from Samples #1 & 2 will be separately interviewed about their tree stewardship knowledge, risk perceptions, and motivations to mitigate climate change. Consenting adults will be asked to engage in narrative interviews immediately after they submit tree monitoring data. Prompts will be semi-structured and gauged to understand how different land managers perceive the impacts of their stewardship changing their individual property, neighborhood, and wider community. We hope to learn how the care and appraisal of tree stewardship translates to positive or negative attitudes toward tree-based solutions to climate change and the overall role of trees to mitigate climate change.

Activity Milestones:

Description	Approximate Completion Date
Identify stakeholder groups across Sample #1 and #2 locations	December 31, 2025
Generate site-specific program and talking points for field tours	June 30, 2026
Lead field tours across each region once/ year	June 30, 2027
Conduct interviews and surveys of participants twice/ year	June 30, 2027

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Extension	University of Minnesota	Facilitate project outreach, co-lead data management	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?
Initial results can be expected in 2026 and will be announced across peer-reviewed and non-academic communication outlets. UMN Extension, Project Manager Coleman, and the Researcher 5 will critically support the mentorship of participatory scientists and undergraduate researchers. The duration of this study could extend 10+ years if based on academic precedents, so extended support would be funded by internal and external grants. Data reporting, visualization, protocol and websites will continue to exist after the project. Ongoing project support maintains existing resources with minor needs for maintenance. Users of the resources are welcome to continue using them with acknowledgment to LCCMR.

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 analysis of urban forestry programs as well as residents' willingness to participate in urban tree planting initiatives and preferences for trees on private property. 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 one master's thesis committee and is onboarding two master's students for Fall 2024. 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 and can support the storage of trees for this study when possible. 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								
Project lead - Alicia Coleman		Lead project deployment, research design and protocol development; Lead data analysis and data management; oversee educational content development			37.1%	5		$50,727
Project co-lead - Anna Stockstad		Lead field tours, co-facilitate educational content development and participant recruitment			37.1%	0.02		$1,672
Project co-lead - Angela Gupta		Co-facilitate participant recruitment, outreach with the ROCs, field tours, and marketing			37.1%	0.02		$4,387
Content and marketing lead - Emily Dombeck		Produce education videos and web content, lead marketing			7.7%	4		$19,057
Undergraduate student researcher (x1)		Assist evaluation and analysis; co-lead seasonal data collection			0%	2		$29,000
Researcher 5 (x1)		Co-manage project with Project Manager and Key Personnel, co-lead outreach and data collection			37.1%	1		$96,655
							Sub Total	**$201,498**
Contracts and Services								
							Sub Total	**-**
Equipment, Tools, and Supplies								
	Tools and Supplies	Trees (x1,100)	to purchase 100 trial trees for each of the 11 ecoregions of Minnesota					$25,000
	Tools and Supplies	Food for 11 field tours/ year (22 tours total)	to conduct one Extension-led field tour per year across demonstration sites in each ecoregion					$2,400
	Tools and Supplies	Demonstration site signage (x11)	to explain purpose and significance of the project at centrally-located demonstration sites in each ecoregion					$1,102

							Sub Total	**$28,502**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	Travel to sites, lodging, and per diem for an estimated 100 trips	"Researchers and Extension staff will need to travel for field tours and data collection approximately 100 times over 2 years"					$25,000
							Sub Total	**$25,000**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
							Sub Total	**-**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$255,000**

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				
			State Sub Total	**-**
Non-State				
			Non State Sub Total	**-**
			Funds Total	**-**

Total Project Cost: $255,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: f31dc9d8-d0e.pdf

Alternate Text for Visual Component

Imaged are Southern tree species unusual to MN and locations on the UMN Saint Paul Ag. Experiment Station where new trees will be trialed as part of the proposed study. Another image depicts the expected climate change conditions are are similar between urban and wildlands-rural forests....

Supplemental Attachments

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

Title	File
Board of Regents of the University of Minnesota	032ed18b-4fa.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

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:

Amber Kevelin and Kelsey Grachek, University of Minnesota