



Environment and Natural Resources Trust Fund

2025 Request for Proposal

General Information

Proposal ID: 2025-102

Proposal Title: Adapting Southeast Minnesota Oak Forests for Climate Change

Project Manager Information

Name: Mike Reinikainen

Organization: MN DNR - Forestry Division

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Project Basic Information

Project Summary: We will assess performance of future-adapted tree seedlings planted across a suite of forested growing conditions associated with silvicultural harvest treatments designed to encourage adaptive capacity in dry-mesic oak-dominated forests.

ENRTF Funds Requested: \$199,000

Proposed Project Completion: June 30, 2028

LCCMR Funding Category: Small Projects (H)

Secondary Category: Air Quality, Climate Change, and Renewable Energy (E)

Project Location

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

Region(s): SE

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.

The Driftless Area is a globally significant landscape located in southeast Minnesota and adjoining states. Forests in this region play a fundamental role in providing wildlife habitat, supporting local economies, and regulating the quantity and quality of water in the Upper Mississippi River basin. Oak-dominated forests in Minnesota's Driftless Area face a host of challenges, including browse pressure from animals, shifting disturbance regimes that favor more shade-tolerant species, and impacts from invasive species. Climate change is expected to compound these challenges and further stress these forests.

Minnesota DNR has partnered with Iowa and Wisconsin DNRs, federal, and university partners to establish an experiment in southeast Minnesota to develop, implement, and test a suite of forest management strategies aimed at making Driftless Area oak-dominated forests better adapted to climate change. This ongoing effort is part of an international network of silvicultural trials known as the Adaptive Silviculture for Climate Change (ASCC) project in which managers and scientists work together to develop future-oriented strategies for maintaining forests in the face of a changing climate. To date, project implementation has been funded by a USDA Landscape Scale Restoration grant with in-kind state support. Current funds will allow for project implementation into spring 2025.

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 leveraging the established ASCC experiment to address management questions about oak-dominated forest regeneration and the understory herbaceous community through in-depth monitoring. This experiment is the first of its kind in the oak forests of the Midwest. The climate-adaptive silvicultural practices being tested will yield new information on impacts to forest regeneration success and the herbaceous community. For example, we are testing underplanting as a silvicultural treatment (planting seedlings under an existing canopy prior to harvest), a tool that may encourage oak regeneration and that foresters are interested in applying more broadly. Evidence suggests underplanting could increase reforestation success, but long-term data are limited and largely come from studies conducted outside of the region. Lastly, in order to maintain the valuable functions provided by mast-producing species (wildlife forage, timber products), it may be necessary to consider increasing tree species diversity and richness via assisted population expansion (moving genotypes within a species' natural range) and range expansion (moving adjacent species slightly beyond their natural range). If funded, we will undertake three years of monitoring to learn and share the impacts of climate-adaptive silvicultural techniques, including climate-adapted tree seedling plantings, on forested plant communities in this threatened ecosystem.

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 study will answer pressing questions related to management of Minnesota's Driftless Area oak forests, including: 1) Can foresters increase reforestation success with underplanting? 2) How do conditions created with climate-adaptive treatments influence establishment, survival, and growth of both naturally regenerated and planted tree seedlings? 3) How does survival and growth of native oak and hickory species compare with similar oak and hickory species planted just outside of their current range (assisted range expansion)? 4) How do the variety of conditions created by climate-adaptive treatments influence species-specific responses? 5) How does the understory herbaceous community respond to these treatments?

Activities and Milestones

Activity 1: Determine the impact of climate-adaptive treatments on oak and hickory regeneration.

Activity Budget: \$99,500

Activity Description:

Objective: To quantify the response of both natural and planted tree seedling regeneration to various forest structural conditions created by three climate adaptation treatments (resistance, resilience, transition) relative to no action (control).

We will measure survival and growth of 10 tree species underplanted (planted prior to treatment in May, 2024) across four treatments, each replicated on three 40+ acre blocks. The experimental blocks are located in dry-mesic oak-hickory forests in southeast Minnesota’s Driftless Area. Sampling will occur over three growing seasons to allow proper assessment of seedling establishment and comparison of growth and survival responses between planted tree seedlings and natural tree regeneration facilitated by the treatments. Tasks include:

- 1) tree regeneration sampling within an established experiment during the 2025, 2026, and 2027 growing seasons,
- 2) data analysis and interpretation of results, and
- 3) communication of results and management recommendations.

Activity Milestones:

Description	Approximate Completion Date
Seedling data collection (Summer 2025, 2026, and 2027)	July 31, 2027
Quantify adaptation treatment impacts on natural and artificial regeneration success	August 31, 2027
Presentation of results and management recommendations to practitioner community	February 28, 2028
Publication of results	June 30, 2028

Activity 2: Determine the impact of climate-adaptive treatments on the herbaceous community

Activity Budget: \$99,500

Activity Description:

Objective: To quantify the influence of climate-adaptive treatments on herbaceous species composition and diversity in dry-mesic oak-hickory forests.

We will measure the abundance (cover) of herbaceous species for three years post-treatment and compare community composition and diversity both among treatments and with conditions observed prior to treatment. Much of the plant species diversity associated with these forest ecosystems occurs in the understory, so a better grasp of treatment impacts is necessary for informing future management, especially as it relates to state listed threatened and endangered species present on project sites (e.g., *Desmodium nudiflorum*). Tasks include:

- 1) vegetation sampling within an established experiment during the 2025, 2026, and 2027 growing seasons,
- 2) data analysis and interpretation, and
- 3) communication of results and management recommendations.

Activity Milestones:

Description	Approximate Completion Date
Herbaceous community data collection (Summer 2025, 2026, and 2027)	July 31, 2027
Quantify adaptation treatment impacts on herbaceous understory community	August 31, 2027
Presentation of results and management recommendations to practitioner community	February 28, 2028

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Dr. Miranda Curzon	Iowa State University	Dr. Curzon is principle investigator on the project from ISU. She will support the annual field data collection, analysis, publication, and communication of results from her lab. She will employ, supervise, and equip a field team including a graduate research assistant and six seasonal undergraduate field employees over three years.	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?

Minnesota DNR currently stewards and advises others stewarding hundreds of thousands of acres of oak forest throughout Minnesota. Outcomes of the proposed project will inform reforestation, conservation, and management of public and private oak forests to ensure this ecosystem maintains function in a changing climate. The project results will be presented to the broader forestry community at regional meetings such as the University of Minnesota Extension's Sustainable Forest Education Cooperative annual Forestry and Wildlife Research conference. Results will also be shared with the forest science community via a thesis and peer-reviewed scientific publication.

Project Manager and Organization Qualifications

Project Manager Name: Mike Reinikainen

Job Title: State Silviculturist

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

Mike Reinikainen, M.S., is MN DNR Division of Forestry's statewide silviculturist. He has a fifteen years of experience working with diverse teams to solve complex forestry issues, with an emphasis on Lake States silviculture systems and applied forest ecology. His experience includes delivering scientific and technical information to a variety of audiences, working collaboratively with universities and other agencies (e.g., MN DNR, WI DNR, IA DNR, USDA Forest Service, and non-profits etc.) to integrate research and practical knowledge to advance the field of silviculture. This work has included collaboration with the many organizations to provide field technical guidance and peer-reviewed research to better inform silviculture in a variety of Minnesota's native plant communities. He has thirteen years of experience collaborating with forest managers and university faculty at a national scale. He has nine years of advanced professional-level experience administering organization-wide forest management programs that included planning, implementation, and evaluation of program and staff activities including silviculture, applied forest ecology, timber harvest, forest road maintenance, and Ecological Classification System. He has nine years of experience creating and monitoring program budgets using a variety of federal and state grant funds and overseeing contracts with partners to accomplish project work.

Organization: MN DNR - Forestry Division

Organization Description:

Minnesota Department of Natural Resources (DNR) Division of Forestry protects and manages the trees, woodlands, and forests entrusted to us for the benefit of the people of Minnesota. Minnesota's 59 state forests, school trust acres, and other forested lands make up the 4.2 million acres we manage. In support of the DNR's mission as forest stewards, we provide our shared expertise to understand, sustain, and manage Minnesota's trees, woodlands, and forests. We use our understanding of the ecology of Minnesota's forested native plant communities and silviculture, the art and science

of controlling the establishment, growth, composition, health, and quality of forests and woodlands, to meet the multitude of purposes and values landowners and society expects from forested ecosystems.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
State silviculturist		MN DNR project manager, subject matter expert, lead state project collaborator, and funding administrator			29%	0.15	X	\$20,446
Forest ecologist/plant ecologist		MN DNR subject matter experts on state-listed threatened and endangered plant species, as well as plant identification and survey techniques			29%	0.05	X	\$6,815
							Sub Total	\$27,261
Contracts and Services								
Iowa State University, Dr. Miranda Curzon	Sub award	Dr. Curzon is principle investigator on the project from ISU. She will support the annual field data collection, analysis, publication, and communication of results from her lab. She will employ, supervise, and equip a field team including a graduate research assistant and six seasonal undergraduate field employees over three years.				3.24		\$166,954
							Sub Total	\$166,954
Equipment, Tools, and Supplies								
							Sub Total	-
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								

							Sub Total	-
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
		Direct and Necessary Costs	Direct and necessary costs cover HR Support (\$482), Safety Support (\$68), Financial Support (\$270), Communication Support (\$1,528), IT Support (\$1,301), and Planning Support (\$1,137).					\$4,785
							Sub Total	\$4,785
							Grand Total	\$199,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Personnel - State silviculturist		MN DNR project manager, subject matter expert, lead state project collaborator, and funding administrator	Classified : We request making this classified position eligible to pay for a small amount of coordination and grant administrative work in support of the project.
Personnel - Forest ecologist/plant ecologist		MN DNR subject matter experts on state-listed threatened and endangered plant species, as well as plant identification and survey techniques	Classified : We request making this classified position eligible to be paid to provide a small amount of technical expertise needed while collecting and interpreting plant data on this project.

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
			Non State Sub Total	-
			Funds Total	-

Total Project Cost: \$199,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [0bf837b0-1b9.pdf](#)

Alternate Text for Visual Component

The map figures associated with Appendix A show how study stand climate adaptation treatments (resistance, resilience, transition, and passive) are laid out in inset A, and where the three study blocks are located in the Driftless area of southeast Minnesota in inset B...

Supplemental Attachments

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

Title	File
ISU Transmittal Letter	3a3da08b-7b0.pdf
ISU Budget Justification	d3d18c60-bd9.docx

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:

Dr. Miranda Curzon of Iowa State University

