

Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-370

Proposal Title: Checking in on Old-Growth and Heritage Oaks

Project Manager Information

Name: Daniel Griffin Organization: U of MN - St. Anthony Falls Laboratory Office Telephone: (612) 625-2562 Email: griffin9@umn.edu

Project Basic Information

Project Summary: To document old-growth oaks on public lands in southern and central Minnesota, we will use treering analysis and field survey techniques to characterize age structure, vegetation composition, and tree health.

ENRTF Funds Requested: \$244,000

Proposed Project Completion: January 31, 2029

LCCMR Funding Category: Small Projects (G) Secondary Category: Land (F)

Project Location

What is the best scale for describing where your work will take place? Region(s): SW, SE, Central, Metro,

What is the best scale to describe the area impacted by your work? Region(s): SW, SE, Central, Metro,

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.

We hypothesize that old-growth and heritage-class bur oak and white oak trees survive in many places in southern and central Minnesota. Our preliminary tree-ring sampling confirms that groves of 200–300+ year-old oaks survive at each of the five sites we have studied so far. Additional scouting indicates that old-growth oak groves likely occur on a dozen or more other public sites across the region.

Bur oak and white oak dominated communities are not well represented in Minnesota's old-growth forest program. That makes sense because Minnesota's old oaks are mostly non-commercial and do not align with classical conceptions of old-growth forest. However, Minnesota's old-growth oaks do fit with what we have seen in related communities elsewhere in the eastern United States. And they are facing a time-sensitive suite of compounding stressors that include fire exclusion, woody plant invasions, insect outbreaks, fungal pathogens, and whiplash from wetness to extreme drought.

Old oak groves represent a critical and likely irreplaceable component of Minnesota's native biodiversity. We believe that there is an important and timely need to expand understanding and appreciation for the characteristics, geographies, and health status of these old oak groves, which could provide critical guidance for conservation management and monitoring.

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 will check in on groves of old-growth oak at 15 sites across the region. We will work with our stakeholder networks to select sites known or believed to have old oaks that span a range of public ownership, including city, county, regional, state, and federal management jurisdictions.

For each site, we will use winter-season tree-ring sampling and other observational techniques to document vegetation community composition, stand age structure, and physical attributes associated with individual old trees: size, crown architecture, stem twist, root collar exposure, etc. Field observations and GIS will be used to characterize the geographic extent and patterns of these old oak groves.

In summer, we will return to assess tree and stand health, documenting canopy conditions and evidence of bur oak blight, oak wilt, and insect and plant invasions. Tree-ring analysis will be used to characterize long-term growth trajectories and to assess for acute changes in oaks that are healthy, stressed, and where possible, recently dead.

Our findings will be presented in regional meetings and we will host three workshops for regional management stakeholders. We will publish a scientific paper and develop plain-language content that could be adapted for various educational and outreach audiences.

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?

Old-growth oak trees survive on public and private lands in many parts of Minnesota, and these under-appreciated groves represent an irreplaceable component of our state's biodiversity. Even in savannas and woodland communities invaded by non-natives and overgrown from fire exclusion, old-growth oaks are keystone organisms that provide critical wildlife habitat and an ideal foundation from which ecosystem restoration efforts can be scaffolded. Combining insights from old-growth forest experts with new tree-ring analysis, this project aims to develop new foundational knowledge and to promote appreciation, awareness, and conservation of old-growth oaks in southern and central Minnesota.

Activities and Milestones

Activity 1: Documentation and characterization of old-growth oak groves

Activity Budget: \$125,616

Activity Description:

Old growth oak groves will be documented and characterized for 15 locations. Sites will be selected through consultation with regional stakeholders, from across a range of public jurisdictional management categories. Fieldwork will include vegetation surveys, tree-ring sampling of approximately 50 trees, photo documentation, and field-based observation for grove mapping. Modified point quarter transects and parallel tree-ring sampling will be used as a randomized representative approach to characterize vegetation community structure, overstory age structure, and stand-level recruitment history. We will conduct supplemental sampling to quantify the ages for the oldest and youngest trees, which are often missed in the randomized sampling. To improve the ability to rapidly predict tree age from size measurements, we will record and rank the importance of individual tree characteristics known to be indicators of old age, including canopy architecture, lateral twist, and root collar exposure. We will use field observations and GIS to characterize the geographic extent and landscape position patterns of these old oak groves. All tree-ring sampling and analysis will be conducted with standard methods, including August–March sampling to avoid oak wilt transmission and the ultra-high resolution photography and image analysis data development tools we have pioneered [https://griffinlab.umn.edu/projects/tree-rings].

Activity Milestones:

Description	Approximate		
	Completion Date		
Select public property study sites and obtain sampling permission (Project Yr1)	October 31, 2026		
Complete fieldwork, vegetation surveys, tree-ring sampling, and field-based mapping for first ten sites	April 30, 2027		
(Project Yr1)			
Complete basic tree-ring specimen processing and dating for the first ten sites (Project Yr2)	December 31, 2027		
Complete fieldwork, vegetation surveys, tree-ring sampling, and field-based mapping for final five sites	April 30, 2028		
(Project Yr2)			
Complete basic tree-ring specimen processing and dating for the last five sites (Project Yr2)	July 31, 2028		

Activity 2: Health check up for old-growth oak groves

Activity Budget: \$68,406

Activity Description:

In the summer following the vegetation surveys and tree-ring sampling, we will return to each site to assess grove health at the tree and stand levels. For each of the approximately 50 trees we sample, we will document canopy conditions and search for evidence of bur oak blight, oak wilt, and invasions by insects and woody plants. These data will be aggregated at the grove and regional levels. To characterize long-term growth trajectories and to search for acute shock response to environmental stressors, we will analyze and contrast tree-ring growth patterns for oaks in different health categories, including those that are healthy, those that are stressed, and where possible, those that are recently dead.

Activity Milestones:

Description	Approximate Completion Date
Complete fieldwork for health checkup for the first ten sites (Project Yr2)	September 30, 2027
Complete tree growth analysis for the first ten sites (Project Yr2)	December 31, 2027
Complete fieldwork for health checkup for the last five sites (Project Yr2)	July 31, 2028
Complete tree growth analysis for the final five sites (Project Yr2)	July 31, 2028

Activity 3: Dissemination of results

Activity Budget: \$33,853

Activity Description:

We will disseminate our results to scientific, management, and general public audiences in the following ways:

i) We will publish a scientific paper in the peer reviewed literature featuring these expected outcomes: a) Documenting survival of old-growth oak on public lands across the study region; b) Describing the physical tree form factors that can be easily observed to improve rapid assessment of tree age; c) Characterizing tree-ring inference on long term growth trajectories and acute influence of environmental stressors and extreme events; d) Summary of the spatial manifestation of these oak groves, in terms of landscape positions and geographic patterns, in order to guide possible identification of additional groves.

ii) We will issue site-specific reports to the agencies of jurisdictional management, featuring the results from Actives 1 and 2, and placing the individual site results in the broader context of the region-wide results.

iii) We will work with education and communication specialists from the UMN Saint Anthony Falls Laboratory, the Minnesota Landscape Arboretum, and the Cedar Creek Ecosystem Science Center to develop more generalized educational and outreach materials that could be adapted for various use cases. These will include fact sheets, large format posters, and a virtual content module.

Activity Milestones:

Description	Approximate Completion Date
Submit a paper to peer review in the scientific literature (Project Yr3)	January 31, 2029
Issue site-specific research reports to management agencies (Project Yr3)	January 31, 2029
Develop and publish generalizable educational and outreach materials (Project Yr3)	January 31, 2029

Activity 4: Coordinate and host stakeholder workshops

Activity Budget: \$16,125

Activity Description:

During the final six months of the project, Drs. Lee Frelich and Daniel Griffin will host a series of stakeholder workshops to showcase project results and findings and to facilitate guidance on future directions for this work in subsequent years. We anticipate half day workshops for 50–100 people from public and private management organizations.

Given the anticipate study sites, we envision hosting one workshop in Mankato, one workshop in St. Cloud, and one workshop in the Twin Cities Metro Area.

For each of these workshops, offering technical presentations on oak ecosystem restoration, tree-ring analysis methods, old-growth forests in Minnesota, and the project findings. We will also facilitate breakout activities for small groups.

Activity Milestones:

Description	Approximate Completion Date
Finalize logistics planning for three workshops (Project Yr3)	August 31, 2028
Host a workshop in for southern Minnesota stakeholders in Mankato (Project Yr3)	October 31, 2028

Host a workshop in for central Minnesota stakeholders in St. Cloud (Project Yr3)	November 30, 2028		
Host a workshop in for metro area stakeholders at the University of Minnesota (Project Yr3)	December 31, 2028		

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Lee Frelich, PhD	University of Minnesota Department of Forest Resources	Dr. Lee Frelich is recognized as an expert on old-growth forests in Eastern North American and has provided critical input on old-growth forest policy in Minnesota. Frelich will work closely with Griffin to provide mentoring, input, and collaborative guidance on research design, implementation, fieldwork, analysis, interpretation, and dissemination of results.	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?

This small grant proposal aims to provide foundational information about the characteristics and health status of oldgrowth oak woodland in Southern and Central Minnesota, which are currently not well documented or understood. We will offer our findings to public land management stakeholders from across a range of jurisdictional levels including municipal, regional, state, and federal, with a primary goal of providing foundational knowledge and scientific perspective that might go on to inform their work with adaptive management and ecosystem restoration practices.

Project Manager and Organization Qualifications

Project Manager Name: Daniel Griffin

Job Title: Associate Professor - University of Minnesota Twin Cities

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

Dr. Griffin is an Associate Professor of Geography and a Faculty Affiliated Researcher at the Saint Anthony Falls Laboratory. He specializes in developing tree-ring records from old-growth forests and using this data to study environmental process and history. Griffin has worked in old growth forests across North America, leveraging tree-ring dating to contribute to old growth conservation and preservation in California, North Carolina, and Oklahoma. Griffin has been conducting exploratory research on old oaks in Minnesota, combining GIS predictive mapping, historical aerial photography analysis, field surveys, and tree-ring dating.

Throughout the life of this project, Griffin will serve as Project Manager and will be involved in all facets of the work, including supervision of individuals employed by the project funding.

Griffin is an effective science communicator for public and professional audiences. He has authored or coauthored over 40 peer reviewed articles published in a wide range of journals including Geophysical Research Letters, Environmental Research Letters, Tree-Ring Research, Natural Areas Journal, Canadian Journal of Forest Research, Global Change Biology, and Science. As principal investigator, he has managed projects with competitive funding from the U.S. National Science Foundation, the U.S. Geological Survey, the U.S. Environmental Protection Agency, and the U.S. National Oceanic and Atmospheric Administration. A signature project in Griffin's lab aims to bring the beauty of tree-ring wood anatomy to the world [https://griffinlab.umn.edu/projects/tree-rings]. He and his team have incubated emerging technologies for ultra-high resolution imaging of entire collections of wood specimens, transforming reproducibility and open-science opportunities related to data development, curation, and visualization. Griffin believes tree rings may be the most inherently accessible gateway to environmental systems.

Organization: U of MN - St. Anthony Falls Laboratory

Organization Description:

The Saint Anthony Falls Laboratory (SAFL) is a world-renowned research facility for environmental fluid mechanics and environmental science, housed under the University of Minnesota's College of Science and Engineering. This 4,880-square-meter facility is built into the side of St. Anthony Falls in downtown Minneapolis, whose water it uses to run some of the largest hydraulics experiments in the world. In addition to direct experimentation with flowing water, SAFL hosts a diverse group of scientists and engineers who work on environmental issues related to Earth's atmosphere, climate, land surface, sediments, and biological processes. The faculty, staff, and students at SAFL spread their efforts across both basic scientific advances and work with immediate applications to infrastructure, the environment, and societal needs. The current SAFL director is Prof. Lian Shen, with Jeff Marr as the associate director for engineering and facilities.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineli	% Bene	# FTE	Class ified	\$ Amount
	,			gible	fits		Staff?	
Personnel				Ŭ				
Daniel Griffin		Principal Investigator and Project Manager			36.6%	0.06		\$55,264
Lee Frelich		Co-Principal Investigator			36.6%	3		\$40,913
Andrew Riesgraf		Technician to spearhead implementation of fieldwork and to participate in data processing and analysis			36.6%	75		\$55,784
Jim Tucker		Engineer to coordinate facilities at SAFL			32.3%	0.06		\$12,562
Undergraduate Research Technician		Undergraduate Researchers to participate in fieldwork and contribute to tree-ring data processing			0%	0.51		\$24,480
Graduate Student Summer RA		Graduate Student Researcher - likely from the Master's in GIS program - to spearhead GIS analysis and mapping and to contribute to fieldwork and data processing			23.2%	0.01		\$19,174
							Sub Total	\$208,177
Contracts and								
Services								
							Sub Total	-
Equipment, Tools, and Supplies								
	Tools and Supplies	Haglof Increment Borer Chuck for Electric Drills (3)	This item allows us to use an electric drill to drive traditional tree-ring increment borers. They do wear out, and should be considered expendable.					\$416
	Tools and Supplies	Haglof Increment Borers (16", 2 thread, 5.15mm diameter; 10 items at \$373 each)	16" increment borers are the most cost effective tool for tree ring sampling of small and middle sized trees. They do wear out and break, and should be considered expendable.					\$3,730
	Tools and Supplies	Haglof Increment Borers (20", 2 thread, 5.15mm diameter; 5 items at \$616 each)	20" increment borers are needed for middle and large sized trees. They do wear out and break, and should be considered expendable.					\$3,080

	Tools and	Haglof Increment Borers (24", 3 thread, 5.15mm	24" increment borers are needed for			\$1,498
	Supplies	diameter; 2 items at \$749 each)	the largest sized trees. They do wear			
			out and break, and should be			
			considered expendable.			
	Tools and	Milwaukee M18 FUEL 18V Lithium-Ion Brushless	This powerful electronic drill is used to			\$200
	Supplies	Cordless 1/2 in. Drill/Driver. (2 items at \$199 each).	increase speed and safety of collecting			
			tree-ring increment cores.			
	Tools and	Milwaukee M18 [™] REDLITHIUM [™] FORGE [™] XC8.0	These batteries provide the most top			\$500
	Supplies	Battery Pack (2 items at \$250 each)	end power for the electronic drill and			
			provide enough charge to last for one			
			day of tree ring sampling.			
	Tools and	Basswood lumber (approximately \$300 worth of	Lumber to make wooden mounts for			\$300
	Supplies	raw boards anticipated for approximately 1,500	tree-ring core preparation, processing,			
		tree cores at approximately 1 foot per core)	and archival storage			
	Tools and	Sanding abrasives (various grits and sizes)	We use aluminum oxide sandpaper			\$500
	Supplies		and micro finishing products to			
			prepare the surfaces of tree cores for			
			imaging and analysis			
	Tools and	Aardvark super jumbo paper drinking straws (1/2	Paper straws are used to transport			\$189
	Supplies	case at \$338)	tree ring core samples from the field			
			to the lab. These are expendable.			
	Tools and	Field Supplies	field supplies as needed			\$178
	Supplies					
					Sub	\$10,591
					Total	
Capital						
Expenditures						
					Sub	-
					Total	
Acquisitions						
and						
Stewardship						
					Sub	-
					Total	
Travel In						
Minnesota						
	Miles/ Meals/	Twelve trips of three days each for three people	Fieldwork travel for Activity 1- We			\$8,514
	Lodging		anticipate twelve trips of three days			
			each for two people, with an average			
			round trip distance estimated at 160			
			miles, including mileage (for one			
			vehicle), hotel accommodations and			

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			per diem for all people, following UMN					
			travel and housing policies and					
			allowable expenses. We anticipate					
			nine of these trips to occur during					
			project year 1 and the remaining three					
			trips to occur in project year 2.					
	Miles/ Meals/	Six trips of two days each for two people	Fieldwork travel for Activity 2 - We					\$6,468
	Lodging		anticipate six trips of two days each					. ,
			and for two people, with an average					
			round trip distance estimated at 160					
			miles including mileage (for one					
			vehicle) hotel accommodations and					
			nor diam for all poopla, following LIMN					
			travel and housing policies and					
			allowable expenses. We enticipate					
			anowable expenses. We anticipate					
			that all of these trips will occur during					
			project year 2.					
							Sub	\$14,982
							Total	
Travel Outside								
Minnesota								
						5	Sub	-
						1	Total	
Printing and								
Publication								
	Publication	Professional journal publication charges (one	We anticipate targeting our scientific					\$5,000
		manuscript)	publication in a high profile journal					
			with open access, which may cost up					
			to \$5000					
						9	Sub	\$5.000
							Total	1-7
Other								
Expenses								
		Stakeholder workshops (3 events estimated at	For Activity 3, we are planning three					\$5,250
		\$1000 each)	half-day stakeholder workshops at an					<i>40)</i> 200
		+	estimated \$1750 each including the					
			venue rental fees and costs for coffee					
			and breakfast snacks					
							Sub	\$E 2E0
						3	Sub Total	३ 5,∠50
							Crevel	6244.000
							Grand	\$244,000
						1	Total	

Classified Staff or Generally Ineligible Expenses

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

Category	Specific Source	Use	Status	Amount
State				
In-Kind	Unrecovered IDC	Unrecovered Indirect costs of 54%.	Secured	\$115,744
			State Sub	\$115,744
			Total	
Non-State				
			Non State	-
			Sub Total	
			Funds	\$115,744
			Total	

Total Project Cost: \$359,744

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component File: d094a5ab-ce1.pdf

Alternate Text for Visual Component

A map figure illustrates 19 public sites where project researchers have observed old oaks across southern and central Minnesota. A photo figure illustrates the appearance of old-growth oaks from nine locations on city parks, regional parks, state parks, and federally managed sites in the study area....

Supplemental Attachments

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

Title	File
Letter of Support	4c091eff-0c1.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?

Yes, Sponsored Projects Administration

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:

Angela Boutch bran0487@umn.edu

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