



## Environment and Natural Resources Trust Fund

### 2026 Request for Proposal

#### General Information

**Proposal ID:** 2026-279

**Proposal Title:** Combined-Use, Publicly-Accessible Native Plant Restoration Science at Itasca

#### Project Manager Information

**Name:** Jonathan Schilling

**Organization:** U of MN - College of Biological Sciences

**Office Telephone:** (651) 724-7364

**Email:** schillin@umn.edu

#### Project Basic Information

**Project Summary:** We propose testing native plant restoration options using a 35-plot grid study at Itasca Biological Station, inside Itasca State Park. The project would be multifunctional for research, education, and demonstration.

**ENRTF Funds Requested:** \$577,000

**Proposed Project Completion:** September 30, 2029

**LCCMR Funding Category:** Fish and Wildlife (D)

#### Project Location

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

Region(s): NW

**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.**

Replanting native plants where non-native, invasive plants have established is a goal that many Minnesotans share. Choosing the right plants, including environmentally-resilient species that will reliably survive, is a decision best informed by relevant local data. Too often, however, people are not able to connect or engage with the science, the scientists, or the best management practices to make informed decisions. These are missed opportunities, and can frame science as an elite and/or urban pursuit. Data suggest that this disconnect has contributed to declines in trust in science and in higher education, markedly in rural areas. Opportunities to do locally-relevant science and to share it with large audiences of all Minnesotans can help bridge this urban-rural divide and keep Minnesota ahead of the National curve, as a model for community-supported innovation.

We propose implementing and leveraging a pre-approved (DNR) native plant restoration study at Itasca to create a unique scientific opportunity that is approachable for Station users and visitors. The study would occupy a small footprint on a regularly-mowed field with invasive plant issues and light foot traffic, but that is highly visible. It will also be easily accessible for students, scientists, and 650,000 annual Itasca State visitors.

### **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.**

The study proposed is multifunctional - it will provide research, education, and demonstration opportunities in one prominent location.

A study area (33 x 47 meters) reclaiming a seldom-used field area would contain a 'checkerboard' of 35 plots (each 5 x 5 meters, plus 2-meter egress 'burn break' strips). Five replicate plots for each plant mix would allow 7 treatments across 35 randomly-assigned plots. Two treatments would be 'no change,' one mowed, one not mowed. The other 5 treatments would test 2 monocultures (grass vs. forb), and 3 local plant mixes, including climate-adaptive options. All seed would be locally sourced.

This study would have similar aesthetics to a long-term grasslands study at the University of Minnesota's Cedar Creek in Isanti County (a Metro-based touchpoint for students), but the novelty at Itasca would be in its approachability, accessibility, and multifunctionality. Nearly 10,000 students, faculty, and staff visit Itasca for research and hands-on courses, annually. Modern facilities and a breadth of unique expertise promise novel research opportunities, layering above- and below-ground data in helpful ways. Itasca Station also plugs into DNR programming, including hosting tours. The approachability of this study offers a straightforward science demonstration available to an array of Minnesotans.

### **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?**

Outcome #1: Site-specific, near-term revegetation management plans for Itasca.

Outcome #2: Continuous data on above- and below-ground benefits (or drawbacks) of vegetation restoration, including practical considerations (example: costs) and novel tools to analyze the plots in ways uniquely possible at Itasca.

Outcome #3: A 'living laboratory' for educational opportunities directly adjacent to modern wet-lab teaching facilities.

Outcome #4: An on-site science demonstration area that is publicly accessible to State Park visitors, Station visitors, and local communities. This includes neighboring Ojibwe communities in White Earth (5 miles to our west), Red Lake (40 miles north), and Leech Lake (25 miles east).

## Activities and Milestones

### Activity 1: Setting up native plant study plots, toward a plan for Itasca campus restoration

**Activity Budget:** \$169,596

**Activity Description:**

Two students (undergraduate + graduate), working with Itasca staff and scientists, will set up the study on ‘Parmelee playing fields.’ In 2014, a modern teaching facility called the ‘Biome Center’ was built at Itasca Station, and a portion of the construction zone was leveled and designated as the playing fields (see Attachment). This area is large, underutilized, and harbors invasive plants – our study would convert a portion back to native plants, and would leverage the opportunity for protocol-based research, education, and demonstration.

The study area (33 x 47 meters) would be a ‘checkerboard’ of 35 plots (each 5 x 5 meters, plus 2-meter egress strips). Five replicate plots for each replanting treatment would allow 7 treatments across 35 randomly-assigned plots. Two treatments would be ‘no change,’ one mowed and one not mowed. The other 5 treatments would test 2 monocultures (grass vs. forb), and 3 local plant mixes, including a climate-adaptive option. All seed would be locally sourced. Deer fencing would likely be used to help plants establish.

The outcomes from this activity are 1) an active native plant plot study at Itasca, 2) sampling protocols (including HPLC) and 3) a dynamic restoration plan for other areas on campus.

**Activity Milestones:**

Description	Approximate Completion Date
Restoration plot study set-up, with initial ‘time zero’ samples in-hand.	September 30, 2026
Sampling protocols in place for future researchers.	July 31, 2027
Results-driven management plan for restoration elsewhere on Itasca Station campus and perhaps the State Park	September 30, 2029

### Activity 2: Layering multiple scientific analyses in the study plots, centered on benefits/drawbacks of restoration

**Activity Budget:** \$350,404

**Activity Description:**

Students (undergraduate + graduate), working with a postdoctoral scientist and visiting faculty, will study above- and below-ground dynamics on the study plots. We hypothesize, based on previous studies, that we will see greater aboveground plant biomass (dry weights) in diverse plant mixtures, relative to monocultures or non-mowed, non-seeded plots. Among 3 mixed-species treatments, we expect that aboveground biomass, species diversity (Shannon index), and costs will inform a best-management option for reseeding other areas of campus.

In addition to baseline practical analyses, we would contextualize effects of restoration on plants and soil microbiota. Using high-performance liquid chromatography (HPLC), we would track plant structural carbohydrates, decomposing plant sugars, soil organic acid profiles, and microbially-bound sterols. These measures, along with C/N, fungal community dynamics (using DNA, via ITS gene sequencing), and bacterial dynamics (16S gene), would provide a biological framework to explain benefits/drawbacks of each treatment. Finally, the breadth of visiting scientists at the Station would have opportunities to layer unique analyses atop these foundational data.

Outcomes from this activity are 1) baseline study data, above- and below-ground, including ‘time zero’ data to

benchmark, 2) novel data from visiting scientists, and 3) published scientific papers led by graduate students and postdoctoral scientists.

#### Activity Milestones:

Description	Approximate Completion Date
Year 1 results acquired for baseline functional data (species richness; soil chemistry; etc.). Publication #1	April 30, 2028
Year 2 results acquired for baseline functional data (species richness; soil chemistry; etc.). Publication #2.	April 30, 2029
Transition yearly sampling to ongoing long-term sampling protocols. Publication #3 and transition publication work.	September 30, 2029

### Activity 3: Leveraging the plant restoration study at Itasca for education and demonstration

**Activity Budget:** \$57,000

#### Activity Description:

Itasca Station hosts nearly 10,000 annual visitors (as ‘bed nights’), primarily students learning in an experiential immersion format. These science-focused users join 650,000 Itasca State Park visitors, with whom the Station engages via Park Naturalist programming, including popular Station campus tours. This proposed restoration science is located adjacent to the modern Biome Center building, lending opportunities to leverage this study to engage a large audience of students and Park users.

Specifically, instructors for 6 current field biology courses (Mammalogy, Animal Behavior, Ornithology, Entomology, Microbiology, Mycology) in May/June could layer their insect diversity, microbial biogeochemistry, and animal use data on these plots. The 800+ incoming first-year University of Minnesota students and faculty instructors in July would study and share their own observations in learning modules. The same would be true of graduate student orientation groups in August-September. Existing joint University-DNR programs (example: Nature of Science; Nature Carts), and monthly Station tours would engage visitors in the plots to better interpret science as a public good.

The outcomes from this activity are 1) educational module development focused on the plots, and 2) systematic engagement of Park visitors via tours and joint University-DNR programming.

#### Activity Milestones:

Description	Approximate Completion Date
Field Course curriculum integration, and operating protocols for DNR public engagement programming - Year 1	September 30, 2027
Field Course curriculum integration, and DNR public engagement programming - Year 2	September 30, 2028
Field Course curriculum integration, and DNR public engagement programming - Year 3	September 30, 2029

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Dr. Michael Smanski	University of Minnesota	Associate Head of Research in Biochemistry, Molecular Biology, and Biophysics - Molecular Biologist - Engaging faculty visiting Itasca for orientations, for alumni events, for training modules, and for research, to utilize the plot array study as an outdoor classroom and a novel study system.	No
Aaron Wunrow	MN Department of Natural Resources (DNR)	Itasca State Park Manager - Ecosystem Scientist - Joint Powers colleague with Itasca Biological Station - We will work with Aaron on all aspects of the project, translating results from this study to Park-wide management decisions. No direct funds - hired scientists will leverage time to work collaboratively with DNR.	No
Victoria Simons	University of Minnesota - Itasca Biological Station & Laboratories	Station Scientist - Will help oversee set-up and analyzes, permitting, and management of intern hands-on efforts on the research plots.	No
Dr. Emily Schilling	University of Minnesota - Itasca Biological Station & Laboratories	Associate Director - Macroinvertebrate ecologist - Will be involved as a researcher as well as the coordinator of education and engagement events, working with Operation Associate, Heather Kokesh. Funding to Schilling will cover undergraduate intern salary, benefits, supplies, services, travel, and publication costs.	Yes
Dr. Margaret Titus	University of Minnesota	Associate Dean of Graduate Studies in the College of Biological Sciences - Microbial Biologist - Engaging graduate students visiting Itasca for orientations, for alumni events, for training modules, and for research, to utilize the plot array study as an outdoor classroom and a novel study system.	No
Constance Cox	MN Department of Natural Resources (DNR)	Itasca State Park Lead Naturalist - The programmatic lead planner for co-coordinating the Nature of Science (NatSci) programs, Nature Carts, Station Tours, and other programs for Itasca State Park visitors. No direct funds - hired scientists will leverage their time to work collaboratively with DNR.	No
Eric Sather	University of Minnesota - Itasca Biological Station & Laboratories	Facilities Lead - Eric manages buildings and grounds employees, as a year-round resident on campus. Funding would enable Eric to supervise mowing protocols and any light construction related to this project (fencing, posting, digging, etc.), as well as participating directing in re-seeding efforts, to help inform future grounds 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?**

The project period is 3 years, plus 3 months (enables a full field season in 2029).

Outcome #1: Site-specific revegetation plans will inform replanting elsewhere on Station grounds (funded by College of Biological Sciences (CBS)), within the Park (locally-staffed), and regionally.

Outcome #2: Data will be shared via publications and presentations, with some costs covered by this award and other costs covered by individual scientists.

Outcome #3: Sampling protocols will be developed for individual courses taught at Itasca, with instructor and intern support from CBS and by existing donor-enabled endowed funds for Itasca students.

Outcome #4: DNR-collaborative programming is self-sustaining.

## Project Manager and Organization Qualifications

**Project Manager Name:** Jonathan Schilling

**Job Title:** Professor and Director

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

Dr. Jonathan Schilling has been on the faculty at the University of Minnesota since 2006. His work in plant and microbial biology, as well as in the field of ecology, have led to 83 peer-reviewed publications, have attracted 43 grants and contracts totaling \$12.2M to support the science in his field of study (Plant & Microbial Biology), and have helped train Bachelors, MS, PhD, and Postdoctoral scholars, many of whom remain in private- and public-sector jobs here in Minnesota. This experience has developed Dr. Schilling's skills managing the fiscal and human resources aspects of grants management, but the projects themselves have also helped develop a larger dynamic network of collaborators and engaged contacts to leverage work toward the greater good of society. The purpose-driven aspect was the motivation for Dr. Schilling to apply for the Director role at the University of Minnesota, College of Biological Sciences (CBS) field station, the Itasca Biological Station and Laboratories (IBSL) in 2017. Since then, Dr. Schilling has co-managed a working scientific lab group averaging 10 scientists in Saint Paul, and a field station team of full-time and seasonal staff (Local 320 Teamsters). Schilling's IBSL success at Itasca is noteworthy (highlighted in the 2024 Annual Report; <https://cbs.umn.edu/itasca>) and has strengthened ties with the Department of Natural Resources (DNR) scientists and staff doing regional science and running Itasca State Park. It has also created relationships with the local community, including tribal neighbors as partners. Because IBSL sits within the boundaries of Itasca State Park, and historically has worked hand-in-hand with the State Park and the DNR to manage park lands as well as share the science process with visitors, this collaborative team is a very logical fit for LCCMR efforts in science and engagement, and Dr. Schilling is well-qualified to lead.

**Organization:** U of MN - College of Biological Sciences

### **Organization Description:**

U of MN - College of Biological Sciences - Itasca Biological Station & Laboratories

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Post Doc		A postdoctoral associate will focus on the science synthesis aspects of the study, thus the focus of most time in years 2 and 3. This postdoctoral associate will interface with a variety of other scientists representing the breadth of science at Itasca. Publications will be an expectation, building on data collected before arriving mid-way in year 1.			20.57%	2.49		\$194,327
Grad Student		Graduate student will help set up and manage the science aspects of the project, embedding their own research questions in the study. The engagement component of the study will be part of their graduate training. This student will travel/stay on-site during field season, and work in Saint Paul in offseason time.			44.53%	2.25		\$180,923
Undergraduate student		Student will be involved in study set-up and regular sampling, as well as interacting with classes and visitors, as part of a summer-long internship at Itasca.			0%	1.5		\$48,000
							<b>Sub Total</b>	<b>\$423,250</b>
<b>Contracts and Services</b>								
							<b>Sub Total</b>	<b>-</b>
<b>Equipment, Tools, and Supplies</b>								
	Equipment	1 High-Performance Liquid Chromatography (HPLC) instrument	A total of \$70,000 is requested toward (not fully covering) the purchase of a high-performance liquid chromatography (HPLC) equipped with refractive index (RI) detector and a UV/Vis detector is request for regular use at the Itasca Station. Having an instrument on-site for					\$70,000

			structural carbohydrate analyses, sugars contents, organic acids, and sterol will be important for real-time analyses during field season. PI Schilling will add \$25,000 toward the purchase, toward the off-peak use of the instrument in winter at Itasca (low use). This will allow the purchase of a \$95,000 HPLC with appropriate detectors.					
	Tools and Supplies	Lab and Field Supplies costs are 'frontloaded' for project/plot set-up in year 1 (deer fencing, soil sampling supplies, laboratory consumables, lumber, seed, etc.), and total \$18,000 over three years. Lab Services costs of \$18,000 are also requested for DNA/RNA analyses, Inductively-Coupled Plasma Spectroscopy (ICP-OES) analyses, etc., at \$6,000 per year.	Lab and Field Supplies costs are 'frontloaded' for project/plot set-up in year 1 (deer fencing, soil sampling supplies, laboratory consumables, lumber, seed, etc.) Lab Services costs are also requested for DNA/RNA analyses, Inductively-Coupled Plasma Spectroscopy (ICP-OES) analyses, etc.					\$36,000
							<b>Sub Total</b>	<b>\$106,000</b>
<b>Capital Expenditures</b>								
							<b>Sub Total</b>	<b>-</b>
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	<b>-</b>
<b>Travel In Minnesota</b>								
	Miles/ Meals/ Lodging	A total of \$38,750 is requested for travel, primarily to cover food and lodging at Itasca Station for one member of the team for the duration of each field season (\$6500 per summer, May-August). An extra \$2000 is included per year to manage back-forth travel from the Schilling lab on the Saint Paul campus (225 miles, each way).	Field Sampling, Lodging, Dining for on-site residence for science at Itasca.					\$38,750
							<b>Sub Total</b>	<b>\$38,750</b>
<b>Travel Outside Minnesota</b>								



							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
	Publication	3 publications, positioned for years 2 and 3 of the project	Publication of research and findings. Scientific journal publication costs vary, but a good rule of thumb is \$3000 per publication, plus one or two more publications free, given library agreements at the time of submission.					\$9,000
							<b>Sub Total</b>	<b>\$9,000</b>
<b>Other Expenses</b>								
							<b>Sub Total</b>	-
							<b>Grand Total</b>	<b>\$577,000</b>

Classified Staff or Generally Ineligible Expenses

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

Category	Specific Source	Use	Status	Amount
<b>State</b>				
			<b>State Sub Total</b>	-
<b>Non-State</b>				
In-Kind	University non-sponsored research funds available to the PI	\$25,000 toward the purchase of an HPLC instrument, toward the off-peak use (and upkeep) of the instrument in winter at Itasca.	Secured	\$25,000
In-Kind	non-state	5% of PIs and collaborators salary, fringe and indirect for unpaid effort on this project	Secured	\$406,679
In-Kind	non-state	Indirect costs for this proposal though not allowed, are listed as in-kind contribution of 54% MTDC which is the Federally Negotiated rate with the U of M. The indirect is proportionate to the awarded funds at a rate of 54% so if the award is reduced the F&A would be reduced.	Secured	\$242,847
			<b>Non State Sub Total</b>	<b>\$674,526</b>
			<b>Funds Total</b>	<b>\$674,526</b>

**Total Project Cost: \$1,251,526**

**This amount accurately reflects total project cost?**

Yes

## Acquisition and Restoration

### Parcel List

Name	County	Site Significance	Activity	Acres	Miles	Estimated Cost	Type of Landowner	Easement or Title Holder	Status of Work
Itasca Biological Station - Parmelee Fields (0.4 to be used for restoration science, of 6.0 total acres)	Clearwater	Itasca Biological Station - Itasca State Park	Restoration	0.4	-	\$25,000	Public	Itasca Biological Station - Itasca State Park	Has Not Begun
<b>Totals</b>				<b>0.4</b>	<b>0</b>	<b>\$25,000</b>			

## Restoration

**1. Provide a statement confirming that all restoration activities completed with these funds will occur on land permanently protected by a conservation easement or public ownership.**

We confirm this. This will occur on DNR-owned State Park property, in an area covered by a Joint Powers agreement with the University of Minnesota.

**2. Summarize the components and expected outcomes of restoration and management plans for the parcels to be restored by your organization, how these plans are kept on file by your organization, and overall strategies for long-term plan implementation.**

We will use the Environment and Natural Resources Trust Fund (ENRTF) Restoration Requirements as a guide for long-term plan implementation, post-project.

**3. Describe how restoration efforts will utilize and follow the Board of Soil and Water Resources “Native Vegetation Establishment and Enhancement Guidelines” in order to ensure ecological integrity and pollinator enhancement.**

Per MN Statutes, section 84.973. we will include a treatment in our study with appropriate diversity to attract pollinators all growing season, and will use 84.973 to guide the selection of best management strategies for on-site restoration, post-project.

**4. Describe how the long-term maintenance and management needs of the parcel being restored with these funds will be met and financed into the future.**

The funding covers project set-up and scientists to track data, share results, and engage the public/students over the project aims and results. Once a restoration plan is identified, future upkeep will be embedded in regular Buildings & Grounds position tasks at the Station (all Local 320 Teamster jobs), with our own mandate to neither add or subtract task time for these employees, but to decrease energy use and increase native biodiversity for lower-maintenance vegetation.

**5. Describe how consideration will be given to contracting with Conservation Corps of Minnesota for any restoration activities.**

We appreciate this component of the LCCMR proposal process. We already host Conservation Corps trainees at Itasca Station, as well as hosting University intern scientists (what we have budgeted to support). Given the size of the pilot project, we are most interested in transitioning future revegetation projects to widen the scope of restoration, using the assistance of Conservation Corps members. Therefore, we will inquire about Conservation Corps experiences during the project, and will focus energy toward one or two Conservation Corps hires for year 3 and onward as we transition our project to widen the areas restored, again following the MN Statutes, section 84.973 and the Environment and Natural Resources Trust Fund (ENRTF) Restoration Requirements document.

**6. Provide a statement indicating that evaluations will be completed on parcels where activities were implemented both 1) initially after activity completion and 2) three years later as a follow-up. Evaluations should analyze improvements to the parcel and whether goals have been met, identify any problems with the implementation, and identify any findings that can be used to improve implementation of future restoration efforts at the site or elsewhere.**

These (above) are the embedded goals of the project. Again, the Environment and Natural Resources Trust Fund (ENRTF) Restoration Requirements will help match this to LCCMR expectations for vegetation restoration efforts.

## Attachments

### Required Attachments

#### Map

File: [0e52067e-8f0.pdf](#)

#### Alternate Text for Map

Figure - Proposed project, visualized....

### Supplemental Attachments

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

Title	File
LCCMR Proposal Approval Letter Schilling	<a href="#">0a58b399-9c3.pdf</a>
DNR Support Form ML26, includes in-kind statement for external approver hours (5 hours - Louis Peterson)	<a href="#">e8f92e58-4eb.pdf</a>

## Administrative Use

**Does your project include restoration or acquisition of land rights?**

Yes: Restoration,

**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:**

Lori Nicol and Elliot Skurich, 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

