

Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-082

Proposal Title: Pioneer Tree Species Assisted Migration for Resilient Forests

Project Manager Information

Name: Andrej Pilipovic Organization: U of MN - Duluth - NRRI Office Telephone: (218) 788-2665 Email: pilip015@d.umn.edu

Project Basic Information

Project Summary: We will identify populations of native poplar species across Minnesota, identify superior parent trees and create collections of most promising material adapted to climate scenarios for assisted migration.

ENRTF Funds Requested: \$171,000

Proposed Project Completion: September 30, 2029

LCCMR Funding Category: Small Projects (G) Secondary 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.

Loss of acres and habitat fragmentation pose a significant threat to adaptation of forest trees to climate change by severing genetically different populations and preventing natural gene flow. According to the climate scenarios, an increase in temperature in the northern part of the state will provide more suitable habitat for the southern populations/provenances. Due to the land fragmentation and pace of climate change, natural succession and species migration must be substituted by human implemented assisted migration.

Eastern Cottonwood and Balsam Poplar are native, pioneer tree species that can be found across the various habitats in Minnesota. In addition to their role of an early succession species, benefits of the targeted species include provisioning of different ecosystem services (ESs) for mankind and provisioning of habitat for wildlife. Their adaptability and genetic plasticity make them ideal assets to cope with the climate change in a two-way manner either using them as a substitute species for threatened ones (i.e. black ash, trembling aspen) or working on assisted migration of the marginal populations aimed to increase species' genetic diversity and adaptability.

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.

Changing markets and a changing climate will have a significant impact on Minnesota's Forests. The Natural Resources Research Institute (NRRI) and its researchers have strong expertise in forestry research with emphasis on forest ecology and forest genetics, including poplar research, which can be beneficial for the preservation and assisted migration of Minnesota's native poplars.

The NRRI's ForCAST project showed a strong decline in the number of aspen acres due to a significant share of older forests difficult to regenerate under all climate scenarios. ForCAST also showed balsam poplar's higher ability to regenerate under all of the climate scenarios and actually increase in acres in areas where it is present. Assisted migration and conservation of forest genetic resources in this project will identify natural populations of the target species across the climate zones, determine their genetic diversity and collect their reproductive material. Collected reproductive material will be further used to create more genetically diverse and adapted plant collections. Such improved collections of plant material could be used in the future afforestation of natural populations of target species or as a substitute for native tree species threatened by various environmental hazards like pest outbreaks (EAB) or drought.

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?

Identification of populations of native poplars in different climate regions across Minnesota, assess their vitality and designate them as a future in-situ Gene Conservation Units (GCUs) of target species.

Collecting of reproductive material of selected GCUs and develop assisted migration guidelines.

Establishment of collections of highly genetically diverse planting material to be used in future climate scenarios serving as new ex-situ GCUs.

Due to the easy vegetative propagation of the poplar plant material, created collections could be easily distributed across the state to various stakeholders (i.e. DNR, forest and other landowners, companies etc.) combined with trainings and guidelines.

Activities and Milestones

Activity 1: Identification of populations, data collection, analysis of climate scenarios

Activity Budget: \$66,000

Activity Description:

Project team will identify native populations of the target species on public lands with the help of MN DNR, US Forest Service and County land management agencies in each of the climate zones across the state. After identification, field survey and inventory and data collection of the populations will be performed aimed to designate future Genetic Conservation Units (GCUs). Data on selected populations will be overlapped with different climate scenarios in order to determine their potential assisted migration routes.

Activity Milestones:

Description	Approximate Completion Date
Identification of populations of target species	September 30, 2026
Data collection in identified populations	May 31, 2027
Analysis of the climate scenarios and data on selected populations	September 30, 2027

Activity 2: Collection of plant material and propagation research

Activity Budget: \$50,000

Activity Description:

Vegetative reproductive material will be collected from the individuals from the designated GCUs for further development of the propagation techniques. Adapting the current propagation techniques NRRI has specialized in for decades, greenhouse tests on the improvement of rooting capabilities will be performed to maximize productivity of the collected material. Based on the findings during the greenhouse experiments, propagation guidelines/protocols for the practitioners will be developed.

Activity Milestones:

Description	Approximate Completion Date
Collection of the plant material	December 31, 2027
Investigation on the improvement of propagation techniques	March 31, 2029
Development of propagation guidelines	August 31, 2029

Activity 3: Establishment of ex-situ collections, education and designation of GCUs

Activity Budget: \$55,000

Activity Description:

Findings from the development of propagation techniques will be shared with forest practitioners and other interested stakeholders through organized training with the support of MN DNR. Collected material will be used to create stoolbeds that will perform as an ex-situ GCUs of the improved genetically more diverse forest reproductive material which will be distributed for future afforestation. Based on the collected data and acquired knowledge from the selected populations, future in-situ GCUs will be defined as a hotspots of the species' genetic diversity for future assisted migration activities.

Activity Milestones:

Description	Approximate Completion Date
Designation of in-situ Gene Conservation Units (GCUs) of target species	December 31, 2028
Education of stakeholders on propagation techniques	May 31, 2029
Establishment of ex-situ collections of plant materials	June 30, 2029
Project final report to LCCMR	September 30, 2029

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Chris Gronewald	Minnesota Department of Natural Resources Forestry Division	Project collaborator on the identification of populations, data provisioning and collecting, identification on Gene Conservation Units (GCUs) of target species, and establishment of plant collections for the production of improved painting material.	No
Alexis Grinde	NRRI	Project collaborator on the development of protocols for the identification of popualtions, data colelcting and data processing, development of gudelines for the use of created plant material.	Yes
Katya Kovalenko	NRRI	Project collaborator on climate and field data processing, developlent of climate change driven assisted migrations scenarios, development of guidelines for the proper use of collected plant material.	Yes
John DuPlissis	NRRI	Project collaborator on climate data processing, landscape modelling, development of propagation techniques and guidelines for the proper use of collected plant material and project reporting together with the project's 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?

Project will result in the creation of future GCUs and collections of genetically diverse plant material that will be more adapted to the future climate scenarios. Due to the vegetative propagation practice when producing poplar planting material, development of the propagation techniques will enable forest practitioners, landowners and other stakeholders to rapidly propagate large amounts of the forest reproductive material. Created collections could also be used for the establishment of seed orchards to produce improved poplar seed material in the future.

Project Manager and Organization Qualifications

Project Manager Name: Andrej Pilipovic

Job Title: Hybrid Poplar Research Program Manager

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

Project manager Dr. Andrej Pilipovic is a researcher at Natural Resources Research Institute of University of Minnesota Duluth working on position of Hybrid Poplar Research Program Manager since 2023. He is a forestry scientist experienced in the improvement of forest tree species focused on adaptation and mitigation of climate change and sustainable development.

His field of research includes the breeding of fast-growing species for multiple uses (i.e. biomass, agroforestry, phytoremediation), identification of the resilient tree species, populations and genotypes using contemporary research methodology, plant physiology and conservation of forest genetic resources. His expertise also includes forest nursery production and management and the transfer of forest reproductive material.

His 23-year expertise across the field of poplar science from fundamental to the applied research was recognized by his appointment of a vice-chair of the UN FAO International Commission on Poplars and Other Fast-Growing Trees Sustaining People and the Environment Working Party on Environmental and Ecosystem Services (2012-2024) and Working Party on Genetic Resources (2024 – present).

Being an expert in forest genetic resources and forest reproductive material, Pilipovic was actively involved in the activities of European Forest Genetic Resources (EUFORGEN) for the period of 2007-2020 working as a member of a experts groups on creation of databases of Gene Conservation Units of Forest tree species in Europe (EUFGIS),

development of Guidelines for the genetic monitoring of forest tree populations (https://www.euforgen.org/aboutus/how-we-operate/discussion-platforms-and-working-groups/genetic-monitoring), and genetic aspects linked to production of forest reproductive material (https://www.euforgen.org/publications/publication/genetic-aspects-linkedto-production-and-use-of-forest-reproductive-material-frm).

Organization: U of MN - Duluth - NRRI

Organization Description:

The Natural Resources Research Institute (NRRI) is a part of the University of Minnesota Duluth and employs over 130 scientists, engineers and technicians. Its mission is to deliver research solutions to balance our economy, resources and environment for resilient communities. NRRI collaborates broadly across the University system, the state and the region to address the challenges of a natural resource based economy.

By partnering with industry, business leaders, agency decision-makers and many others, NRRI researchers frame and deliver on real-world solutions. NRRI scientists have extensive experience in managing large, interdisciplinary projects. Major objectives include the development of tools for environmental assessment and resource management. NRRI's role is as an impartial, science-based resource that develops and translates knowledge by characterizing and defining value-resource opportunities, minimizing waste and environmental impact, maximizing value from natural resource utilization and maintaining/restoring ecosystem function.

Major outcomes from NRRI projects include informing environmental management and policy and assisting industry and communities in defining and maintaining the social license to operate in natural systems. NRRI has an established mechanism for sharing outcomes through press releases, publication in peer-reviewed journals, annual reports (https://www.nrri.umn.edu/resources-publications/annual-reports), periodicals, and through social media channels.

Budget Summary

Category /	Subcategory	Description	Purpose	Gen.	% Bene	# FTF	Class	\$ Amount
Nume	ortype			gible	fits		Staff?	
Personnel				8				
Andrej		Principal investigator: Project management and			26.8%	2.88		\$35,017
Pilipovic		coordination, development of propagation						
		experiements, data processing and reporting						
John DuPlissis		Project management, climate data processing,			26.8%	0.09		\$18,839
		landscape modelling, disemination and reporting						
Alexis Grinde		Project management, development of data			26.8%	0.09		\$14,000
		collecting protocols, data processing, development						
		of guidelines						
Katya		Climate and field data processing, developlent of			26.8%	0.09		\$12,021
Kovalenko		climate change driven assisted migrations						
		scenarios, development of guidelines						
Josh		Field data & sample collection, plant propagation			24.4%	0.15		\$12,298
Kragthorpe	(ragthorpe and establishment of plant collections		Ļ	ļ				
Josh Bednar		Field data & sample collection, plant propagation			24.4%	0.09		\$8,632
		and establishment of plant collections					<u> </u>	
Undergraduate		Field data & sample collection, plant propagation			0%	0.09		\$3 <i>,</i> 305
student - field		and establishment of plant collections						
technician								40.000
Field		Field data & sample colliction			6.9%	0.09		\$6,663
technician								
(Temp/Casual)						<u> </u>		4440
							Sub Total	\$110,775
Contracts and								
Services								
TBD	Service	We will use service contactor which services will be				0.3		\$15,000
Contractor	Contract	related to the collection of plant material,						
		establishment and management of the created						
		plant collections.						
							Sub	\$15,000
							Total	
Equipment,								
Tools, and								
Supplies								-
	Tools and	Hand tools for sampling (small chainsaw, tree	Hand tools, packaging materials,					\$7,525
1	Supplies	pruner, loppers and shears), sample packaging	labels, flagging material and tree paint	1	1	1	1	

						Sub Total	-
Capital Expenditures							
						Sub Total	\$20,725
			the equipment. Estimated unit price is \$1000.				
			during this part of the project activities what would require 3 sets of				
			At least 3 teams will be collecting data				
			provide better data collection efficacy.				
			processed, digital equipment should				
			number of populations to be				
			tree species. Due to the large				
			populations of the targeted native				
			collect data in the selected				
			digital caliper and hypsometer to				
	Equipment	Tablets (3 pcs)	Tablets will be used together with	Х			\$3,000
			Hypsometer.				
			are \$1400 for digital caliner \$2000 for				
			activities what would require 3 sets of				
			during this part of the project				
			At least 3 teams will be collecting data				
			provide better data collection efficacy.				
			processed, digital equipment should				
			number of populations to be				
			amounts of data and possible large				
		5615 15 5.	tree species. Due to the large				
		digital caliper and hypsometer. Total number of	used to collect data in the selected				
	Equipment	Field data collecting equipment set consisting of:	Digital caliper and hypsometer will be				\$10,200
			establishment of plant collections.				
			planting material for the				
			propagation techniques and create				
			substances will be used to test				
		promoting substances.	mixture and plant growth promoting				
		containers, nutrients and other plant growth	and pack it. Containers, soil potting				
		naint growing soil notting mixtures plant	collect tissue samples for propagation				
		materials labeling and flagging materials marking	will be used to label selected trees				

Acquisitions and							
Stewardship							
						Sub Total	-
Travel In Minnesota							
	Miles/ Meals/ Lodging	Travel for fieldwork, including mileage (75%) and lodging for technician, researcher, and undergraduate research assistant. Mileage will be reimbursed at the approved U of M travel rate. Lodging is estimated between \$90 and \$110 per night, less if camping is possible. Some trips will involve longer-distance travel and require overnight expenses (camping or motel) and food expenses.	Collect field data and plant material.				\$15,000
						Sub Total	\$15,000
Travel Outside Minnesota							
	Conference Registration Miles/ Meals/ Lodging	Two persons will present project achievements at the scientific conferences. This cost is estimated as \$2500 per participant and will include 2 travels (\$ 900 each), 2 lodgings (\$600 each), 2 registration fees (\$400 each) and 2 sets of per diems (\$300 each) and other unpredicted eligible costs (\$300 each). The travel will be conducted within the US.	Presentation of project achievements at scientific conferences in 2029	x			\$5,000
						Sub Total	\$5,000
Printing and Publication							
	Printing	Promotional material	Promotional material on the Assisted Migration to be distributed to stakeholders during the trainings and other project promotional activities.				\$1,500
						Sub Total	\$1,500
Other Expenses							
•		Shipping costs	This cost will include shipping of the collected plant material collected in the selected populations across the Minnesota to NRRI for further				\$1,000

Workshop organization	development of propagating techniques and creation of the plant collections. This expenditure will cover costs of the organization of 2 trainings during the duration of the project. Trainings will be conducted with the aim to disseminate information on the developed assisted migration practices to interested stakeholders like MNDNR, USDA Forest Service, tribal foresters and other interested forest practitioners. Estimated cost per training is \$1000 (\$500 space rental, \$500 coffee break and other		\$2,000
	misc. costs).		
		Sub Tot) \$3,000 al
		Gra Tot	nd \$171,000 al

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Equipment, Tools, and Supplies		Tablets (3 pcs)	Tablets will be used during the filed data collection as source of maps for orientation, identification and recording of selected populations. They will be connected with the digital caliper and hypsometer to store collected data directly in the filed and do the basic statistical analysis right away, if needed.
Travel Outside Minnesota	Conference Registration Miles/Meals/Lodging	Two persons will present project achievements at the scientific conferences. This cost is estimated as \$2500 per participant and will include 2 travels (\$ 900 each), 2 lodgings (\$600 each), 2 registration fees (\$400 each) and 2 sets of per diems (\$300 each) and other unpredicted eligible costs (\$300 each). The travel will be conducted within the US.	Due to the possibility that these thematic scientific conferences that fit the project scope could have a venue outside Minnesota, but within the USA, we have predicted this cost. In the case of such event within the state, we will request modification of this budget line.

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub	-
			Total	
Non-State				
In-Kind	UMN unrecovered indirect costs are calculated at the UMN negotiated rate for research of 54% modified total direct costs.	Indirect costs are those costs incurred for common or joint objectives that cannot be readily identified with a specific sponsored program or institutional activity. Examples include utilities, building maintenance, clerical salaries, and general supplies. (https://research.umn.edu/units/oca/fa-costs/direct-indirect-costs)	Secured	\$92,340
			Non State Sub Total	\$92,340
			Funds	\$92,340
			Total	

Total Project Cost: \$263,340

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component File: 7bd2d3ae-032.pdf

Alternate Text for Visual Component

The Visual Componet shows two botanical drawings and two pictures of balsam poplar and cottonwood; plant hardiness zoness in Minnesota created on the basis of historical climate data (1980-2009) and according to future climate scenarios (2010-2039; 2040-2069 and 2070-2099); and a text describing project idea overview, project goals and outcomes....

Supplemental Attachments

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

Title	File
UMD SPA Authorization Letter	<u>d04b017d-78c.pdf</u>
DNR Support request	<u>e95b418f-4ee.pdf</u>
DNR Support Letter email 2	51da9801-040.pdf
DNR Support letter email 1	<u>c576394b-88e.pdf</u>

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?

No

Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration (UMD)

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:

Megan Gorder, UMD-NRRI's research administration

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

Yes, I understand