Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-036

Proposal Title: A Second Life For Urban Ash Trees

Project Manager Information

Name: Matthew Aro

Organization: U of MN - Duluth - NRRI

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Project Basic Information

Project Summary: This project is a model for reducing the community impact of emerald ash borer (EAB) and promoting long-term carbon sequestration via demonstration of beneficial reuse of EAB-infested ash trees.

Funds Requested: $156,000

Proposed Project Completion: 2023-06-30

LCCMR Funding Category: Small Projects (H)

Secondary Category: Land Acquisition for Habitat and Recreation (G)

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?

Region(s): SE

When will the work impact occur?

During the Project

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Minnesota has the largest concentration of ash trees in the U.S., where 1 in 5 community trees are ash – all of these trees are susceptible to the Emerald Ash Borer (EAB), an invasive beetle that attacks and kills 99% of ash trees one to three years after infestation. EAB infestations were discovered in St. Paul in 2009, greater Duluth in 2016, and the Rochester area in 2015. Twenty one Minnesota counties now report EAB infestations. Rochester currently has tree canopy cover estimated at 25% citywide, with 15% being ash. It is likely that a majority of these ash trees will be infested and killed by the EAB unless costly mitigation efforts are taken.

It costs approximately $1,000 to remove and replace a single city-owned ash tree, and the MN DNR estimates that EAB could kill up to 25,000 trees in community forests annually. It is estimated that EAB management will cost the City of Rochester $5.5 million. While composting, landfilling, or burning of the infested trees are mitigation options, they are less desirable than higher value utilization options, such as in added-value wood products.

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

We propose to demonstrate the value-added reuse of ash trees from EAB infestation zones in Rochester by developing thermally modified ash boardwalk material for construction of a new 400-foot-long boardwalk in Gamehaven Regional Park in Rochester. Thermal modification is a commercially available, chemical-free technology that improves dimensional stability and decay and moisture resistance of lumber. The thermal treatment is severe enough to effectively kill EAB eggs and larvae and thereby prevent its spread. Our objective is to use this technology to add value to the EAB-infested ash trees in Rochester, a community considered to be at “high risk” of EAB infestation, while supporting the regional manufacturing industry and keeping the wood in the community by promoting the production, sales, and use of thermally modified ash in urban parks. Further, by developing and utilizing these durable, chemical-free wood products, there is long-term sequestration of carbon in the ash trees. (If the wood was simply disposed of via burning, greenhouse gases and pollutants such as carbon dioxide (CO2), particulate matter, carbon monoxide (CO), sulfur dioxide (SO2), volatile organic compounds (VOCs), and nitrogen oxides (NOx) would be immediately emitted to the atmosphere.)

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state’s natural resources?

The outcomes are designed to increase value-added utilization of EAB-infested ash, increase long-term sequestration of carbon in the ash trees, and enhance the experience for Gamehaven Regional Park visitors. The outcomes are to:

1. Design and install a 400-foot-long boardwalk manufactured from thermally modified ash at Gamehaven Regional Park.
2. Educate Gamehaven Regional Park visitors, community members, and forest products industry stakeholders on the economic and environmental benefits of utilizing innovative, chemical-free thermally modified ash from EAB-infested trees.
3. Demonstrate a model for value-added utilization of EAB-infested ash that can be replicated elsewhere in Minnesota parks and outdoor recreation areas.

Activities and Milestones

Activity 1: Thermally modify the EAB-infested ash lumber to impart improved exterior exposure performance without chemicals

Activity Budget: $18,400

Activity Description:
We will execute a Compliance Agreement with the Minnesota Department of Agriculture to ensure that all EAB-related regulations are followed prior to transporting the lumber outside of the Rochester EAB quarantine zone. Then, the 8-feet-long by 2-inches-thick by 6-inches-wide ash lumber for the boardwalk surface will be shipped to Superior ThermoWood of Brainerd (www.thermowoodmn.co; Palisade, MN) and thermally modified to impart improved dimensional stability and decay and moisture resistance. The wood will then be shipped to Rochester, MN for storage until boardwalk construction begins.

Activity Milestones:

Description	Completion Date
Execute Compliance Agreement with Minnesota Department of Agriculture for safe transport of ash lumber	2023-01-31
Transport the ash lumber from Rochester to Superior ThermoWood of Brainerd (Palisade, MN)	2023-02-28
Thermally modify the ash lumber	2023-03-31
Transport the thermally modified ash lumber from Palisade to Gamehaven Regional Park (Rochester)	2023-04-30

Activity 2: Construct boardwalk and disseminate economic and environmental benefits of value-added utilization of EAB-infested ash

Activity Budget: $68,904

Activity Description:
Rochester Department of Parks and Recreation will coordinate construction of a 400-foot-long boardwalk in Gamehaven Regional Park. The boardwalk will pass over a wetland to give park visitors and neighborhood members easy and new access to the park. The NRRI and other volunteers will provide assistance in boardwalk construction. Once the boardwalk is installed, the NRRI and Rochester Department of Parks and Recreation will disseminate the economic and environmental benefits of value-added utilization of EAB-infested ash from the City of Rochester. To accomplish this Activity and publicize this innovative use of wood, we will communicate these benefits to Park visitors, landowners, timber harvesters and processors, wood products distributors, and other industry stakeholders. We will also educate visitors during Citizen Forester program events, share web-based media (e.g., electronic newsletters, webpages, social media) with public and private stakeholders, post educational signage at Gamehaven Regional Park, and conduct an educational workshop at Gamehaven Regional Park.

Activity Milestones:

Description	Completion Date
Conduct workshop to educate Park visitors on economic and environmental benefits of increased ash utilization	2023-06-30
Share economic and environmental benefits of increased ash utilization with a range of stakeholders	2023-06-30
Construct 400-foot-long boardwalk in Gamehaven Regional Park	2023-06-30

Activity 3: Harvest EAB-infested ash in Rochester, mill into lumber, and kiln dry

Activity Budget: $68,696

Activity Description:

EAB-infested ash trees in Rochester will be harvested during normal operations in the winter of 2021/2022 and milled into lumber in the spring of 2022 using a portable sawmill. Milling will produce ash lumber that is 8-feet-long by 2-inches-thick by 6-inches-wide for the boardwalk surface; the boardwalk will require 8,500 board-feet of this lumber. The team will also produce ash lumber that is 2-inches-thick by 12-inches-wide for the boardwalk framing members; this will require 2,640 board-feet of lumber. The team will also produce black locust lumber posts that are 4-inches-wide by 4-inches-thick for the boardwalk supports; this will require 1,056 board feet of lumber. All lumber will be kiln-dried by a commercial partner located within the Rochester area EAB quarantine zone.

Activity Milestones:

Description	Completion Date
Harvest EAB-infested ash trees	2022-03-31
Harvest black locust trees and mill into posts for boardwalk supports	2022-05-31
Mill the harvested ash trees into lumber for boardwalk surface and framing members	2022-05-31
Kiln dry all lumber	2022-12-31

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
John Bieganek	Superior ThermoWood of Brainerd	John will be responsible for receiving the ash lumber, thermally modifying the ash lumber, and preparing the thermally modified ash lumber for shipment to Gamehaven Regional Park in Rochester, MN.	Yes
Jeff Haberman	City of Rochester (MN) Department of Parks and Recreation	Jeff will be responsible for harvesting the EAB-infested ash trees, milling the lumber, preparing the lumber for shipment to Superior ThermoWood of Brainerd, coordinating construction of the boardwalk at Gamehaven Regional Park, and assisting in disseminating the environmental and economic benefits of value-added utilization of EAB-infested ash trees.	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 be funded?

This project accelerates and complements a larger strategy to develop best and highest-value reuse of EAB-infested ash. While the proposed Activities will be completed during the funded project period, the project team intends to continue to share project results and benefits with key stakeholders after project completion. Project Manager Matthew Aro (NRRI) will lead these efforts using funds legislatively-appropriated to the University of Minnesota Duluth.

Project Manager and Organization Qualifications

Project Manager Name: Matthew Aro

Job Title: Research Program Manager

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

Project Manager Matthew Aro is a Research Program Manager of Wood Products at the University of Minnesota Duluth Natural Resources Research Institute (NRRI). He earned a B.S. in Broad Field Science from the University of Wisconsin-Superior, an M.S. in Management of Technology from the University of Minnesota, and an M.S. in Natural Resources Science and Management from the University of Minnesota. Since his start with the NRRI in 2003, he has worked on a broad spectrum of applied research projects, often conducted in cooperation with private industry, dealing with wood- and natural fiber-based materials. He regularly interacts and collaborates with public and private sector professionals and academicians in the wood products field. Project collaborators have included state agencies, the U.S. Department of Agriculture, the National Science Foundation, and the private sector (both in the U.S. and abroad). Much of this work has focused on advancing industrial development of thermally modified wood in the U.S.

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 / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Matthew Aro		Project Manager responsible for preparing all LCCMR-required reports and leading project tasks to ensure they are completed on time and within budget.			26.7%	0.4		$41,284
Scott Johnson		Assist with boardwalk construction and shipping of lumber.			24.1%	0.1		$7,429
							Sub Total	**$48,713**
Contracts and Services								
City of Rochester (MN), Department of Parks and Recreation	Sub award	Will be responsible for harvesting the EAB-infested ash, milling into lumber, preparing the lumber for shipment to Superior ThermoWood of Brainerd, coordinating construction of the new boardwalk at Gamehaven Regional Park, and assisting in disseminating the environmental and economic benefits of value-added utilization of EAB-infested ash.				0		$60,900
Superior ThermoWood of Brainerd	Professional or Technical Service Contract	Superior ThermoWood of Brainerd will thermally modify 8,500 board-feet of ash lumber, finish/plane the lumber, and prepare it for return shipment to Rochester, MN.				0		$13,317
TBD	Professional or Technical Service Contract	To disseminate the economic and environmental benefits of increased utilization of EAB-infested ash, we will post weatherproof educational signage at Gamehaven Regional Park. This expense is for hiring a company to develop the signage.				0		$5,000
TBD	Professional or Technical Service Contract	We will contract with a vendor to kiln dry all lumber used in the project. The vendor will be located within the EAB quarantine zone so the project team will be able to safely and legally transport the lumber from Rochester to the kiln dry vendor.				0		$15,625
							Sub Total	**$94,842**

Equipment, Tools, and Supplies								
	Tools and Supplies	Supplies for installation of the weatherproof educational signage, including framing and support posts.	These supplies will be used to support the weatherproof educational signage, which will be installed at Gamehaven Regional Park.					$2,618
							Sub Total	**$2,618**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	Roundtrip automobile travel from Duluth to Rochester (3 trips in Year 2). Each trip includes one overnight and per diem.	The purpose of this travel is to assist in construction of the boardwalk and to host the educational workshop at Gamehaven Regional Park.					$2,077
							Sub Total	**$2,077**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
	Printing	Printing paper/large-format printing costs for educational materials	The printing will be used to develop educational materials to disseminate the economic and environmental benefits of increased utilization of EAB-infested ash					$250
							Sub Total	**$250**

Other Expenses								
		Shipping	Shipping ash lumber from kiln dry vendor to Superior ThermoWood of Brainerd (Palisade, MN).					$2,500
		Shipping	Shipping ash lumber from Superior ThermoWood of Brainerd (Palisade, MN) to Gamehaven Regional Park (Rochester, MN).					$2,000
		Shipping	Shipping lumber from kiln dry vendor to Gamehaven Regional Park (Rochester, MN).					$1,000
		Shipping	Shipping lumber from Rochester to kiln dry vendor					$2,000
							Sub Total	**$7,500**
							Grand Total	**$156,000**

Classified Staff or Generally Ineligible Expenses

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

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
In-Kind	UMN unrecovered indirect costs are calculated at the UMN negotiated rate for research of 55% 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	$66,055
In-Kind	City of Rochester, Department of Parks and Recreation	The City of Rochester Department of Parks and Recreation will contribute $8,785 of in-kind support to the project, as described below. City of Rochester staff time for milling ash lumber: 200 hours at $35/hour ($7,000) and 30 hours at $59.50/hour ($1,785).	Secured	$8,785
			Non State Sub Total	**$74,840**
			Funds Total	**$74,840**

Attachments

Required Attachments

Visual Component

File: faef7231-d75.pdf

Alternate Text for Visual Component

Minnesota stakeholders and Gamehaven Regional Park (Rochester, MN) visitors will be educated on the economic and environmental benefits of utilizing thermally modified ash (made from emerald ash borer (EAB)-infested ash trees harvested in Rochester) for a new boardwalk constructed at Gamehaven Regional Park.

Optional Attachments

Support Letter or Other

Title	File
Letter of Support from Rochester Active Sports Club (RASC)	7caa459b-2ec.pdf
Letter of Support from ArborWood Co.	4ba1c98b-629.pdf
Letter of Support from BlueLinx	28530c36-902.pdf
Letter of Support from U.S. Forest Service Forest Products Marketing Unit	b7f03961-02a.pdf
Letter of Participation from Superior ThermoWood of Brainerd	2d5ec0d6-928.pdf
Letter of Match Commitment from Rochester Parks and Recreation	76a9682d-f23.pdf
Sponsored Projects Transmittal Letter	f5d388da-bfa.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have patent, royalties, or revenue potential?

No

Does your project include research?

No

Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration

Natural Resources Research Institute
University of Minnesota Duluth
Driven to Discover

PROJECT DESCRIPTION: Produce Thermally Modified Wood (TMW) from Emerald Ash Borer (EAB) infested trees in Rochester, MN to build a recreational resource and educational opportunity.

PROJECT OUTCOMES

- Value-add process develops regional natural resources
- Develop utilization for EAB-infested ash trees in Rochester, MN
- Increase long-term sequestration of carbon in the ash trees
- Develop resources for recreational opportunities
- Create an educational opportunity for the public

EAB-infested Ash

TMW Lumber

Educational Opportunity

TMW Boardwalk

Rochester, MN

Go. Play. Explore. Rochester Parks & Recreation

Project Partner

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