



Environment and Natural Resources Trust Fund

M.L. 2023 Approved Work Plan

General Information

ID Number: 2023-043

Staff Lead: Mike Campana

Date this document submitted to LCCMR: May 22, 2023

Project Title: Biochar Implementation in Habitat Restoration: A Pilot

Project Budget: \$185,000

Project Manager Information

Name: Todd Rexine

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Project Reporting

Date Work Plan Approved by LCCMR: June 22, 2023

Reporting Schedule: February 1 / August 1 of each year.

Project Completion: June 30, 2026

Final Report Due Date: August 14, 2026

Legal Information

Legal Citation: M.L. 2023, Chp. 60, Art. 2, Sec. 2, Subd. 07b

Appropriation Language: \$185,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with Great River Greening to pilot the use of portable biochar kilns as an alternative to open-pile burning of trees and shrubs to reduce smoke and carbon emissions and produce beneficial by-products from invasive species removal and land restoration efforts.

Appropriation End Date: June 30, 2026

Narrative

Project Summary: Pilot the implementation of portable biochar kilns in natural resource management and restoration as a reduced carbon-emitting, biologically beneficial alternative to open pile burning when managing invasive trees and shrubs.

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

Woody encroachment and woody invasive species control on habitat projects can produce large quantities of waste wood. On-site pile burning is the cheapest method of disposal, while the chip and log markets are saturated due to EAB etc., making these preferred disposal methods even more costly. Pile burning leaves room for improvement in terms of carbon balance and soil fire scars.

Biochar is the process of burning biomass at high temperatures under low-oxygen conditions that converts it into a product that can be used as a soil additive for carbon sequestration, drought resistance, and microbial support in natural systems, farm fields, and gardens. Biochar production releases less smoke and greenhouse gas than pile burning. While it requires specific equipment and knowledge, it is an accessible technology and process. By reducing barriers to its use for land managers, local government units, and service providers, its use can multiply quickly with this modest investment for a pilot demonstration program.

In addition to the carbon sequestration benefits of biochar, indirectly it will help contain the costs of 1) the removal of invasive woody species, and 2) thinning of wooded habitats in a significant percentage of habitat restoration projects.

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.

Great River Greening is proposing a pilot project to address the scalability of biochar kilns as an effective technique for processing waste wood material from natural resource management activities. As part of the process, several “Oregon” and “Ring of Fire” biochar kilns will be purchased. Using kilns for processing waste wood will decrease the adverse climate effects of alternative burn methods. GRG will work with municipalities, soil and water conservation districts, and other land-owning partners to utilize this technique to reduce greenhouse emissions while reducing waste from land restoration actions.

Funding will support on-site demonstrations, monitoring results, and dissemination of results. In addition, funding will allow outreach on the applications of biochar production for natural resource management on public lands and connecting with individuals on how to implement it on private lands. The message of sustainable land management practices will benefit practitioners in the short term as well as communities in the long term, increasing awareness of climate-related issues and how positive steps like biochar kilns can help.

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?

We propose to:

- Convert the burning of invasive wood species or log piles from the conventional manner to the biochar pyrolysis method.
- Demonstrate biochar production at 9 restoration and enhancement sites throughout 3 regions of Minnesota.
- Engage 75 land managers, local government units, and natural resource practitioners in the process.
- Engage 50 volunteers to promote use on residential-scale
- Allow access to kilns for land managers, local government units, and natural resource practitioners to test out.
- Calculate and assess the cubic yards of biochar that can be processed from invasive wood waste at different scales of density.

Project Location

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

Region(s): Central, Metro, SE,

What is the best scale to describe the area impacted by your work?

Region(s): Central, Metro, SE,

When will the work impact occur?

During the Project and In the Future

Activities and Milestones

Activity 1: 1. Purchase and construct biochar kilns.

Activity Budget: \$42,500

Activity Description:

After a thorough review with peers and partners, we will purchase or contract fabrication of up to 10 “Oregon” and “Ring of Fire” kilns to be used across three MN regions: Central, SE, and Metro. One “Oregon” or “Ring of Fire” kiln can process 6-10 cubic yards of brush per day producing 1.5 cubic yards of biochar or .44 tons of sequestered carbon per kiln. A properly trained technician has the ability to supervise 2-3 kilns per day. Staff will work to collect quotes on the purchase and shipping of "Ring of Fire" kilns. For "Oregon" kilns staff will draft plans and bid documents to solicit MN-based metal fabricators for bids. Staff will oversee the fabrication process to make sure specifications for "Oregon" kilns are met. Great River Greening staff will pick up and transport "Oregon" kilns that are fabricated.

Activity Milestones:

Description	Approximate Completion Date
Contract metal fabricators and collect quotes on producing and purchasing kilns	September 30, 2023
Procure supplies and equipment to promote safe and reliable implementation of kilns	November 30, 2023
Oversee purchasing and fabrication of up to 10 kilns	February 28, 2024

Activity 2: Biochar Demonstration and Outreach.

Activity Budget: \$100,500

Activity Description:

DEMONSTRATION: Great River Greening will use and demonstrate kilns on 9 sites throughout the 3 proposed regions of Minnesota. We will monitor and document the process including:

- Testing the quality of biochar produced through sample testing,
- Monitoring the timing and process to produce a full kiln of biochar,
- Conducting pre-cutting density counts to discern the quantity of biochar produced per acre.
- Discussion on the carbon sequestration gained.

OUTREACH: Offer trainings on how to use biochar kilns properly and safely for wood waste disposal. Trainings would be offered to land managers, service providers, and other organizations that would share the benefits of using on-site kilns to manage tree and shrub removal in addition to how to use a kiln. This process will also involve other entities having access to testing the kilns on projects, specifically landowners, practitioners, and other organizations that could benefit from using biochar kilns in habitat restoration activities.

Activity Milestones:

Description	Approximate Completion Date
Contract vendors to cut and prep material for biochar demonstrations and trainings.	September 30, 2023
Define projects with land owning partners – 9 total sites throughout 3 regions of Minnesota.	December 31, 2023
Test the quality of biochar produced from invasive tree and shrub species.	June 30, 2025
Begin demonstrations and trainings	September 30, 2025
Demonstrate the efficacy and scalability of biochar techniques in each region by facilitating kiln use.	December 31, 2025
Engage 75 practitioners and 50 volunteers through 9 trainings and demonstrations	March 31, 2026

Activity 3: Dissemination

Activity Budget: \$42,000

Activity Description:

Produce educational materials on biochar applications in natural resource projects, contextualized for land managers and natural resource practitioners.

Notify service providers and land managers that Great River Greening will be integrating the required use of biochar kilns for any future land management over onsite pile burning or brush stacking. By making biochar a requirement for wood waste removal for all vendors on our sites, GRG will greatly expand the positive impacts of biochar and increase the speed of adoption.

Dissemination will occur to

- Land Managers,
- Local governmental units,
- Educational institutions,
- Other NGOs
- For-profit service providers
- Individual Landowners

Activity Milestones:

Description	Approximate Completion Date
Develop materials summarizing the efficacy of the use of the kilns in different land management.	February 28, 2026
Disseminate the information to 100 local governmental units, non-governmental organizations, municipalities, and/or service providers.	April 30, 2026

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.

Great River Greening will disseminate information related to Biochar Implementation through onsite 9 demonstrations and trainings in three regions, presentations at natural resource meetings and seminars, email list serve subscribers, and digital brochures, as well as through our website and social media accounts. Information will include how to get started and set up biochar kilns, the benefits of processing bio-matter in this way, and the calculation of the cubic yards of biochar that can be processed from invasive wood waste at different scales of density and the carbon impact. All dissemination will follow the Environment and Natural Resources Trust Fund acknowledgment guidelines.

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 is a pilot project that will accelerate biochar kiln implementation to become a new standard operating procedure for natural resource management projects in the future. Long-term funding is to be determined as part of the initial partner development. There is some commercial value to biochar which may be a catalyst for larger implementation in Minnesota. Biochar produced from this funding will be utilized by the landowners and Great River Greening as a beneficial soil amendment in related habitat restoration projects and/or given away to volunteers, landowners, and partners, etc; but will not be sold for financial gain.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Upland, Wetland, and Shoreline Restoration in Greater Metropolitan Area	M.L. 2016, Chp. 186, Sec. 2, Subd. 08g	\$509,000
Community Stewardship to Restore Urban Natural Resources - Phase Ten	M.L. 2017, Chp. 96, Sec. 2, Subd. 08i	\$524,000
Pollinator Central: Habitat Improvement with Citizen Monitoring	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 08a	\$750,000
Pollinator Central II: Habitat Improvement With Community Monitoring	M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 08c	\$631,000

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Ecologist and Project Manager		Coordination with the land managers and natural resource practitioners for project implementation.			21%	0.54		\$50,000
Grant Manager		Grant management and project implementation.			21%	0.39		\$30,000
Outreach and Communications		Coordination of outreach and demonstration events and dissemination of informational materials.			21%	0.09		\$5,000
Field Crew		Implementation of biochar production and on-site field work.			9%	0.18		\$10,000
Grant Administration		Finance administration and grant fund coordination, status reporting, and amendment communication.			24%	0.09		\$5,000
							Sub Total	\$100,000
Contracts and Services								
TBD	Professional or Technical Service Contract	Contracting land management service providers to incorporate the use of biochar kilns in the disposal of woody material on projects coordinated with Great River Greening and the land-owning partners.				0.24		\$40,000
TBD	Professional or Technical Service Contract	Fabrication of biochar kilns				0.08		\$15,000
							Sub Total	\$55,000
Equipment, Tools, and Supplies								
	Tools and Supplies	Supplies and equipment required for kiln use	Purchase of supplies and equipment to facilitate the safe handling of kilns and biochar. Examples: PPE, infrared thermometers, fire suppression equipment					\$5,000
	Equipment	Purchase of biochar kilns and shipping costs	Biochar kilns will be stationed in 3 listed regions of the State for					\$9,000

			demonstrations and for entities to test after participating in demonstrations.					
							Sub Total	\$14,000
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Travel to and from project sites, partner meetings, and outreach events.	Support on-site visits and project implementation.					\$4,000
							Sub Total	\$4,000
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
	Printing	Printing of informational material to give to land managers and natural resource practitioners.	Material will be distributed to educate land managers and natural resource practitioners on the applications of biochar kilns in habitat restoration woody material disposal.					\$2,000
							Sub Total	\$2,000
Other Expenses								
		Event related expenses	Tents, tables, chairs, food, latrine, etc, as required to support project demonstration and educational events in promotion of the LCCMR strategy and objectives.	X				\$10,000
							Sub Total	\$10,000
							Grand Total	\$185,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Other Expenses		Event related expenses	Event-related expenses will support participant and volunteer hours needed to accomplish project deliverables and to provide education to participants and volunteers on the ecological benefits of the project and awareness of LCCMR's commitment and funding to this project.

Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount
State				
Cash	Outdoor Heritage Funded projects.	These projects will support the material cutting portion of the biochar production.	Pending	\$50,000
			State Sub Total	\$50,000
Non-State				
In-Kind	Municipal and other land owning partners.	Landowner labor and time facilitating the use of biochar kilns.	Potential	\$20,000
Cash	Municipal and other land owning partners.	A variety of expenses directly related to the individual landowner or partner sites such as contracting, material purchase, or indirect expenses related to the management projects.	Potential	\$20,000
In-Kind	GRG administrative match	GRG staff indirect administrative expense to do the work for this grant.	Secured	\$5,000
Cash	GRG cash match.	GRG direct expenses required to do the work for this grant.	Secured	\$30,000
Cash	USDA - Partnership for Climate-Smart Commodities	Assess the commodity side of biochar from natural resource management and feasibility for use in agriculture applications in MN.	Potential	\$50,000
			Non State Sub Total	\$125,000
			Funds Total	\$175,000

Attachments

Required Attachments

Visual Component

File: [1eb79185-849.pdf](#)

Alternate Text for Visual Component

Summary of the Great River Greening biochar grant proposal with illustrations of the biochar production process and outlines of the proposed activities....

Financial Capacity

File: [685652a4-b6b.pdf](#)

Board Resolution or Letter

Title	File
GRG Board Resolution LCCMR ML2023FY2024 Biochar	09f3cf80-886.pdf

Optional Attachments

Support Letter, Photos, Media, Other

Title	File
Letter of Support - Dakota County	c24a3494-9f0.pdf
ML 2023 Great River Greening Biochar flyer	65da8fb7-a6a.pdf
LCCMR Background Check Certification Form	4b18fa52-4c5.pdf

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

Uploaded background check form and Dissemination Efforts

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

N/A

Do you agree travel expenses must 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 agree to the Commissioner's Plan.

Does your project have potential for royalties, copyrights, patents, or sale of products and assets?

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?

No