



Environment and Natural Resources Trust Fund

2027 Request for Proposal

General Information

Proposal ID: 2027-186

Proposal Title: Expanding On-Site Biochar Statewide

Project Manager Information

Name: Todd Rexine

Organization: Great River Greening

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Project Basic Information

Project Summary: Great River Greening will advance scaling biochar on site for Natural Resource Management of wood waste, leading biochar demonstrations and documenting the effects on soil nutrient levels in buckthorn-infested landscapes.

ENRTF Funds Requested: \$298,000

Proposed Project Completion: December 31, 2030

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.

Wood waste from invasive shrub removal, woodland restoration, and hazard tree work is a growing management challenge across Minnesota. Disposing of this material is costly and logistically difficult, and open pile burning produces heavy smoke, releases greenhouse gases, and leaves burn scars that set restoration back. On-site biochar offers a practical alternative. By processing waste wood under low-oxygen, high-heat conditions, practitioners can convert a liability into a stable soil amendment that stores carbon, improves soil moisture resilience and microbial function.

Through the previously funded ENRTF pilot phase (M.L.2023-043), Great River Greening gathered feedback from land managers and service providers and identified two priority questions that must be answered to move from demonstrations to wider implementation. First, what does on-site biochar production look like at operational scale (10 acres or more), and what efficiencies are gained in time, labor, and volume processed? Second, what are the effects of applying raw biochar back onto buckthorn-infested woodland soils, including changes in soil nutrients and buckthorn regeneration?

Demand has grown beyond the pilot geography, with partners requesting training and demonstrations statewide. This proposal builds on the pilot to support larger-scale processing, field-based monitoring, and broader adoption of biochar as a natural resource

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 will expand Minnesota's capacity to use on-site biochar as a practical tool for natural resource management by combining statewide demonstrations, larger-scale processing pilots, and field monitoring. Building on the pilot, we will offer hands-on demonstrations and trainings that show land managers and service providers how to safely and effectively convert woody debris from restoration and invasive removal into biochar using flame-cap kiln systems. We will respond to growing demand beyond the pilot geography by hosting demonstrations across the state and increasing access to equipment so partners can test and adopt the practice in their own work.

An expansion of the pilot phase will also answer key operational questions about scalability. Great River Greening will work with qualified providers using multiple Ring of Fire kilns (purchased through the pilot) and larger 10-cubic-yard kilns (purchased with private funds) to process wood waste at sites of 10 acres or more. We will document time, labor, volume, and biochar output to define efficient, repeatable workflows.

Finally, we will monitor the effects of applying raw, on-site-produced biochar on buckthorn-infested woodland soils, tracking soil nutrients and buckthorn regeneration. Together, these efforts will support broader, lower-smoke wood waste management and stronger restoration outcomes statewide.

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?

Demonstrate biochar production at 9 sites statewide.

Engage 90 land managers, local government units, and service providers in the process.

Engage 50 individuals on the use at residential scale.

Allow access to kilns for land managers, local government units, and natural resource practitioners.

Work with contractors at 2 sites to process biochar at scale from wood waste related to natural resources management. Calculate and assess the cubic yards of biochar that can be processed at scale from invasive wood waste at different scales of density.

Measure the effects of the direct application of biochar on buckthorn-infested woodland and forest soils

Activities and Milestones

Activity 1: Biochar Demonstration

Activity Budget: \$92,200

Activity Description:

Great River Greening will deliver statewide demonstrations and trainings on safe, effective use of flame-cap biochar kilns as an alternative to open pile burning of woody debris generated through restoration and invasive removal. Trainings will be designed for land managers, local government units, service providers, individuals, and partner organizations and will cover kiln setup, safe operation, burn management, quenching, and proper handling and storage of finished biochar. Participants will leave with practical guidance on when on-site biochar is an appropriate tool, how to plan for staffing and material preparation, and how to integrate kiln use into habitat restoration work.

This activity will also expand hands-on access to equipment by enabling partners to test kilns on real projects and share lessons learned across sites. Great River Greening will monitor and document each demonstration to support repeatable implementation, including:

- Biochar quality testing through sample analysis
- Time and process documentation to produce a full kiln
- Pre-cutting stand density counts to estimate biochar yield per acre
- Estimated carbon stored in produced biochar (based on volume produced and lab-reported carbon content)

Activity Milestones:

Description	Approximate Completion Date
Work with partners to identify demonstration opportunities	January 31, 2028
Begin implementing demonstrations	May 31, 2028
Wrap up demonstrations	November 30, 2030

Activity 2: Processing Biochar at Scale

Activity Budget: \$122,000

Activity Description:

Great River Greening will partner with qualified contractors at two sites (10 acres or more) to process woody debris into biochar at operational scale. Material will come from natural resource management activities such as invasive species removal, prescribed tree and shrub thinning, diseased tree removal, or reducing woody encroachment to restore habitat. We will prioritize sites that can generate at least 100 cubic yards of wood waste and produce more than 20 cubic yards of biochar, allowing us to evaluate efficiency and repeatable workflows at a meaningful scale.

Contractors will build hands-on expertise operating larger kiln systems, and Great River Greening will document the process so land managers and service providers can understand the labor, time, and equipment needs for scaling beyond small demonstrations. Documentation and reporting will include:

- Stand density prior to removal
- Pre-processing material volume (cubic yards)
- Time required to process material at scale
- Biochar produced (cubic yards)
- Biochar quality, verified through independent lab testing to International Biochar Initiative standards

Activity Milestones:

Description	Approximate Completion Date
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Identify sites	December 31, 2027
Hire natural resource contractor(s) and begin processing	December 31, 2028
Report on results	December 31, 2030

Activity 3: Monitoring

Activity Budget: \$83,800

Activity Description:

Great River Greening will evaluate how applying raw, on-site-produced biochar influences buckthorn-infested woodland soils and inhibits buckthorn regeneration. Monitoring will occur pre and post biochar application to compare changes in soil nutrients and texture and to track buckthorn sprouting and resprouting. To isolate biochar effects, only raw biochar will be used, with no blending or amendments (no compost, manure, or fertilizers) prior to application.

Monitoring will use paired treatment and control plots, photo-point documentation, and vegetation surveys.

- Establish plots at three locations, each with a ¼-acre test plot and a ¼-acre control plot
- Apply biochar made from buckthorn removed on-site to the test plots
- Apply 10 cubic yards of biochar per test plot
- Collect five soil samples per plot twice per year for three years for nutrient and texture analysis
- Conduct vegetation transect surveys and photo-point monitoring three times per growing season

Activity Milestones:

Description	Approximate Completion Date
Identify sites and pre application sampling, vegetation survey and set up photo points	December 31, 2027
Complete first year monitoring and data collection	December 31, 2028
Complete second year monitoring and data collection	December 31, 2029
Complete third year monitoring, data collection and report	December 31, 2030

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.

Funding acknowledgments will be included in all outreach, social media, and project reports, and acknowledged verbally at in-person events, consistent with ENRTF Acknowledgement Requirements and Guidelines. Great River Greening will share project updates and results through our website, newsletter, and social media, including volunteer and youth tree planting and stewardship events. Documentation will include planting locations and counts, species lists, watering and pruning records, volunteer participation, and photo documentation. We will collect and report participant feedback and demographic information, as appropriate, to improve engagement and ensure the project is meeting community needs. Interim and final reports will summarize outcomes and lessons learned.

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 results of this project will be implemented directly through land management practice. Demonstrations and scaled processing will produce repeatable, documented workflows that land managers, local government units, and service providers can apply to wood waste generated through restoration. Monitoring results will inform when raw, on-site-produced biochar is a beneficial amendment in woodlands and how it can fit within restoration plans. After the grant period, Great River Greening will continue integrating on-site biochar into conservation planning and habitat restoration projects with partners. Ongoing effort will be supported through a mix of partner contributions, private philanthropy, and future public grants.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Engaging a Diverse Public in Environmental Stewardship	M.L. 2022, , Chp. 94, Art. , Sec. 2, Subd. 05d	\$300,000
Biochar Implementation in Habitat Restoration: A Pilot	M.L. 2023, , Chp. 60, Art. 2, Sec. 2, Subd. 07b	\$185,000
Building Resilient Urban Forests for Climate Change	M.L. 2024, , Chp. 83, Art. , Sec. 2, Subd. 07b	\$752,000

Project Manager and Organization Qualifications

Project Manager Name: Todd Rexine

Job Title: Conservation Director

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

Todd Rexine leads Great River Greening's Biochar Initiative and is widely recognized as a Minnesota leader in implementing on-site biochar production for natural resource management. He serves on the Minnesota Biochar Initiative board of directors and was invited to speak at the North American Biochar Conference hosted by the United States Biochar Initiative in Minneapolis, reflecting his expertise in practical, field-based biochar deployment. Todd brings extensive experience planning, executing, and funding habitat restoration projects and understands how to integrate innovative practices into on-the-ground conservation work. As Great River Greening's Conservation Director, he oversees conservation programs and staff, ensures projects meet organizational goals, and applies a systems-level approach that considers how natural and human systems interact.

Organization: Great River Greening

Organization Description:

Great River Greening's mission is to inspire, engage and lead local communities in conserving and caring for the land and water that enrich our lives.

Great River Greening as a non-profit has been restoring, adapting, and sustainably managing ecosystems to address climate change, providing benefits for both people and the environment since 1995. To achieve our vision of healthy, climate change resilient ecosystems throughout MN, Great River Greening leans into the practices and projects that can truly impact our shared climate future. Our land-based restoration centers on three pillars of impact: (1) Restoring resilient landscapes, (2) Addressing critical biodiversity loss, and (3) Increasing carbon sequestration and storage.

Environmental stewardship is one of our core commitments. We partner with the communities we serve to increase environmental connection, teach environmental restoration, and ultimately empower committed individuals to join us in caring for our shared natural resources, engaging 8,000+ volunteers annually.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Grant and Program Manager		Grant management and project implementation. Coordination with the land managers and natural resource practitioners for project implementation.			21.83%	0.24		\$38,300
Ecologist		On the ground coordination with land managers and natural resource practitioners for implementation.			21.83%	0.46		\$68,200
Field Crew		Implementation of biochar demonstrations, equipment movement and soil sampling.			21.83%	0.35		\$46,000
Grant Administration		Finance administration and grant fund coordination, status reporting, and amendment communication.			21.83%	0.07		\$10,000
Events & Outreach		Managing recruitment for demonstrations			21%	0.03		\$2,800
							Sub Total	\$165,300
Contracts and Services								
Natural resource contractor	Service Contract	Contracted land management service providers to process wood waste on-site to biochar at scale from natural resource management activities.				0.28		\$90,000
Biochar testing lab	Service Contract	Biochar testing analysis - testing to International Biochar standards				0.02		\$4,100
Soil testing facility	Service Contract	Soil nutrient and texture testing of samples.				0.06		\$18,000
							Sub Total	\$112,100
Equipment, Tools, and Supplies								
	Tools and Supplies	Supplies and equipment required for kiln use	Purchase of supplies to facilitate use of biochar kilns and to support biochar and soil sampling.					\$6,000
							Sub Total	\$6,000
Capital Equipment								

							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Travel related to project sites and demosntrations sites	Averaged trip miles, per diem and lodging to support travel to various parts of the state for demonstrations, contractor oversight, and soil and vegetation sampling to support activities in the project.					\$14,100
							Sub Total	\$14,100
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
		Permits	Local and state burn permits					\$500
							Sub Total	\$500
							Grand Total	\$298,000

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
State				
			State Sub Total	-
Non-State				
Cash	Great River Greening - cash match	GRG contribution for expenses related to this project not covered by the grant	Pending	\$68,000
In-Kind	Local Government partners	Site preparation of biochar demonstrations	Potential	\$20,000
Cash	Private foundations	Support of biochar demos and monitoring	Potential	\$20,000
			Non State Sub Total	\$108,000
			Funds Total	\$108,000

Total Project Cost: \$406,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [56b97ec3-ab6.pdf](#)

Alternate Text for Visual Component

2-page document summarizing the proposed project...

Financial Capacity

Title	File
GRG Good Standing	69bce9df-b4a.pdf
2024 GRG Audit	49a0c230-012.pdf
2024 GRG 990	ea386d47-fbc.pdf

Board Resolution or Letter

Title	File
Great River Greening 2027-186 Biochar Board Letter	9bbedce1-985.pdf

Supplemental Attachments

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

Title	File
Letter of Support Dovetail Partners	4b701e4f-b13.pdf
Letter of Support MN Biochar Initiative	a313120c-efb.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 Commissioner's Plan 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?

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:

Wiley Buck - Great River Greening

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