

**Environment and Natural Resources Trust Fund**

# 2022 Request for Proposal

## **General Information**

**Proposal ID:** 2022-120

**Proposal Title:** Biochar Implementation in Habitat Restoration: Pilot

## **Project Manager Information**

**Name:** Rebecca Tucker

**Organization:** Great River Greening

**Office Telephone:** (651) 272-3982

**Email:** rtucker@greatrivergreening.org

## **Project Basic Information**

**Project Summary:** Implement the use of biochar kilns as a low carbon emitting, biologically beneficial alternative to woody material disposal in habitat restoration projects.

**Funds Requested:** $176,000

**Proposed Project Completion:** June 30 2025

**LCCMR Funding Category:** Small Projects (H) **Secondary Category:** Air Quality, Climate Change, and Renewable Energy (E)

## **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

## **Narrative**

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

Habitat restoration activities such as woody invasive species control, prairie maintenance, and structured removal of diseased trees such as oak, ash or elm can produce large quantities of physical material to be disposed of as part of the land management action. The woody biomass may be hauled off site to be burned in a bioreactor or sold to lumberyards, activities that are frequently cost-prohibitive in markets with increasingly limited outlets. Consequently, land managers frequently open burn it in piles. While this method is cost-effective in the short term, it leaves room for improvement in terms of carbon balance, reduction in soil fire scars, and in the creation of beneficial soil amendments.

Biochar is the product of burning woody material at high temperatures under low-oxygen conditions that converts biomass into a product that can be used as a soil addition for carbon sequestration, drought resistance, and microbial support in prairies, farm fields, and gardens. Biochar production releases less smoke and greenhouse gas than typical burning but requires specific physical conditions, equipment, and knowledge that land managers and natural resource practitioners may not have access to or experience with, preventing them from utilizing this method of woody material disposal and carbon capture.

**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.**

Great River Greening is proposing a pilot project to build and/or purchase biochar kilns and implement this method of material disposal on projects around the state to demonstrate the productive disposal of the byproducts of natural resource management activities. We will gather information on what methods have been shown to utilize wood that would otherwise have been eliminated at a cost to the land owner and a detriment to the climate, then 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 outreach on the applications of biochar production on public lands as well as in agricultural and urban areas. 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 positive steps that can be taken by people in many situations. The demonstration of the direct applications of biochar kilns to landowners and natural resource practitioners will allow a broader set of organizations to include these practices in future land management activities, increasing the utilization of this material disposal technique.

**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 demonstration of biochar production in the context of natural resource management will expand this technique to a broader group of land managers. We propose to convert the burning of brush or log piles from the conventional manner to the biochar pyrolysis method at 9 total sites throughout 3 regions of Minnesota, engaging 75 land managers and natural resource practitioners in the process. Dissemination of the efficacy of these techniques will occur to landowners, local governmental units, educational institutions, and to the significant network of project partners and contracting organizations with whom Great River Greening facilitates these habitat restoration activities.

## **Activities and Milestones**

### **Activity 1: 1. Purchase and construct biochar kilns.**

**Activity Budget:** $38,000

**Activity Description:**Currently, land managers and natural resource practitioners do not have access to the physical kilns or easily implementable techniques for biochar production as a means of woody waste disposal. To reduce that barrier, we will facilitate the purchase or physical construction of multiple types of kilns that may be transported to sites for in-situ biochar production and demonstration. We will first gather information on the types, sizes, and models of kilns that are currently being produced, coordinating with local land managers and restoration professionals to confirm the applicability of these levels of biochar production, then purchase or construct 3 sets of kilns for each scale of application deemed feasible.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Gather information to determine the appropriate types of kilns for land management material disposal. | December 31 2022 |
| Purchase or construct 3 sets of kilns for each scale of application deemed feasible. | June 30 2023 |

### **Activity 2: 2. Test and implement biochar kilns and burning practices.**

**Activity Budget:** $94,000

**Activity Description:**The on-site production of biochar from the woody biproducts of habitat restorations in multiple regions of the state through collaborations with land owning partners and local land managers. We will test multiple scales of biochar production and types of production methods to determine what application is realistically feasible for different types of woody removal and different types of land (WMA vs city park). This activity will support the use of kilns on 9 sites throughout the 3 proposed regions of Minnesota.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Define projects with land owning partners – 9 total sites throughout 3 regions of Minnesota. | June 30 2023 |
| Test the efficacy and scale of biochar techniques in each region by facilitating kiln use. | December 31 2024 |

### **Activity 3: 3. Community involvement and outreach education.**

**Activity Budget:** $44,000

**Activity Description:**Produce and disseminate educational materials on biochar applications in natural resource projects, contextualized for land managers and natural resource practitioners. This will also involve demonstration events specifically with partners, educational institutions, land owners, and organizations that could benefit from the use of biochar kilns in habitat restoration activities.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Engage 75 practitioners in the use of the biochar kilns to demonstrate the biochar process. | June 30 2024 |
| Develop materials summarizing the efficacy of the use of the kilns in different land management. | December 31 2024 |
| Disseminate the information to 9 local governmental units, non-governmental organizations, municipalities, or service providers. | June 30 2025 |

## **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 is a pilot project identifying opportunities related to this material disposal technique. Long term funding and implementation is to be determined as part of the initial partner development, but may include a larger scale proposal to the Minnesota Environment and Natural Resource Trust Funds and other organizations. 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 land owners and Great River Greening as a beneficial soil amendment in the related habitat restoration projects but will not be sold for financial gain.

## **Other ENRTF Appropriations Awarded in the Last Six Years**

|  |  |  |
| --- | --- | --- |
| **Name** | **Appropriation** | **Amount Awarded** |
| Upland and Shoreline Restoration in Greater Metropolitan Area | M.L. 2014, Chp. 226, Sec. 2, Subd. 06g | $300,000 |
| Metro Conservation Corridors Phase VIII - Enhancing Restoration Techniques for Improved Climate Resilience and Pollinator Conservation | M.L. 2015, Chp. 76, Sec. 2, Subd. 08f | $400,000 |
| 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 |

## **Project Manager and Organization Qualifications**

**Project Manager Name:** Rebecca Tucker

**Job Title:** Program Manager

**Provide description of the project manager’s qualifications to manage the proposed project.**Rebecca Tucker (M.S. Botany and Population Genetics, Purdue University), has a diverse set of experience planning, executing, and funding the restoration of native habitats. After studying wild rice for her masters, she spent three and a half years as a research assistant at the Archbold Biological Station in Florida where she carried out plant and habitat assessments, managed hydrological engineering plans, coordinated bidding and budgets for contracted restoration projects, and implemented a variety of land management activities. Before coming to Great River Greening, Rebecca was a research assistant on the University of Minnesota Healthy Prairies project. She has also engaged the public through educational talks and worked on numerous farm and greenhouse research projects at a number of organizations. Currently, as Great River Greening's Twin Cities Metro Program Manager, Rebecca develops and manages the urban enhancement and restoration within the seven county metro area focused primarily on invasive species reduction, pollinator habitat establishment, and local community outreach.

**Organization:** Great River Greening

**Organization Description:**Great River Greening’s mission is to secure the legacy of Minnesota land and water through community-based restoration, stewardship and partnership, striving to improve Minnesota’s natural resources, protect clean air and water, and increase community access to sustainable open space. Since 1995, Great River Greening has engaged 47,000 volunteers (12,500 of them youth) in hands-on education and stewardship activities, helping restore over 12,000 acres of habitat in 400 communities across Minnesota. Great River Greening focuses our work in locations and on activities that provide conservation impact, ecosystem services, and community benefits, with projects including: developing planting designs and/or restoration management plans for natural areas; planting native trees, shrubs, wildflowers, and grasses; stabilizing shorelands and ravines; conducting ecological inventories; implementing conservation practices on farmland; and completing restoration and management activities including exotic species removal, prairie seed collection, and prescribed burns. In addition, Great River Greening engages community members from schools, faith groups, civic groups, businesses, and veterans groups in public volunteer events and engages over 100 youth per year through targeted service-learning programs. Through community education and engagement, Greening is restoring natural resources, while building environmental leaders and stewards of tomorrow.

## **Budget Summary**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Category / Name** | **Subcategory or Type** | **Description** | **Purpose** | **Gen. Ineli gible** | **% Bene fits** | **# FTE** | **Class ified Staff?** | **$ Amount** |
| **Personnel** |  |  |  |  |  |  |  |  |
| 4 Ecologists and Project Managers |  | Coordination with the land managers and natural resource practitioners for project implementation. |  |  | 21% | 0.54 |  | $50,000 |
| 1 Grant Manager |  | Grant management and project implementation. |  |  | 21% | 0.39 |  | $30,000 |
| 2 Outreach and Communications |  | Coordination of outreach and demonstration events and dissemination of informational materials. |  |  | 21% | 0.09 |  | $5,000 |
| 3 Field Crew |  | Implementation of biochar production and on-site field work. |  |  | 9% | 0.18 |  | $10,000 |
| 3 Accounting Staff |  | 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. |  |  |  | - |  | $40,000 |
| TBD | Professional or Technical Service Contract | The production of biochar kilns and required ancillary equipment for safe and effective use on multiple scales. |  |  |  | - |  | $10,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$50,000** |
| **Equipment, Tools, and Supplies** |  |  |  |  |  |  |  |  |
|  | Equipment | Biochar kilns | Purchase a variety of kiln types to convert the waste woody material from habitat restoration activities to biochar. |  |  |  |  | $5,000 |
|  | Tools and Supplies | Biochar kiln supporting supplies. | Tools and supplies required for the safe and effective use of biochar kilns. |  |  |  |  | $2,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$7,000** |
| **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. |  |  |  |  | $3,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$3,000** |
| **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. |  |  |  |  | $1,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$1,000** |
| **Other Expenses** |  |  |  |  |  |  |  |  |
|  |  | Kiln mobilization and storage expenses | Facilitate the movement and storage of the biochar kilns. |  |  |  |  | $5,000 |
|  |  | 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. |  |  |  |  | $10,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$15,000** |
|  |  |  |  |  |  |  | **Grand Total** | **$176,000** |

### **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** |  |  |  |  |
| In-Kind | 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 | $5,000 |
|  |  |  | **Non State Sub Total** | **$50,000** |
|  |  |  | **Funds Total** | **$100,000** |

## **Attachments**

### **Required Attachments**

#### ***Visual Component***

File: [b0f146a5-279.pdf](https://lccmrprojectmgmt.leg.mn/media/map/b0f146a5-279.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: [dd2b16c1-ba7.pdf](https://lccmrprojectmgmt.leg.mn/media/financial_capacity/dd2b16c1-ba7.pdf)

#### ***Board Resolution or Letter***

|  |  |
| --- | --- |
| **Title** | **File** |
| GRG Board Resolution ML2022 Biochar | [afbf81a7-7b9.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/afbf81a7-7b9.pdf) |

### **Optional Attachments**

#### ***Support Letter or Other***

|  |  |
| --- | --- |
| **Title** | **File** |
| GRG LCCMR Biochar Support Letter - Dovetail Partners | [0cb48d54-7c7.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/0cb48d54-7c7.pdf) |
| GRG LCCMR Biochar Support Letter - Scott County | [9ce43cda-ab3.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/9ce43cda-ab3.pdf) |
| GRG LCCMR Biochar Support Letter - Dakota County | [4d9347ad-fb4.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/4d9347ad-fb4.pdf) |
| GRG LCCMR Biochar Support Letter - City of St Paul | [ac5a0297-1e4.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/ac5a0297-1e4.pdf) |

## **Administrative Use**

**Does your project include restoration or acquisition of land rights?**
 No

**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