

**Environment and Natural Resources Trust Fund**

# 2021 Request for Proposal

## **General Information**

**Proposal ID:** 2021-284

**Proposal Title:** EAB and Black Ash: Maintaining Forests and Benefits

## **Project Manager Information**

**Name:** Alexis Grinde

**Organization:** U of MN - Duluth - NRRI

**Office Telephone:** (218) 788-2747

**Email:** agrinde@d.umn.edu

## **Project Basic Information**

**Project Summary:** Utilize ongoing experiments to determine long-term EAB impacts on water, vegetation, and wildlife; optimal replacement species and practices for forest diversification; develop indicators and criteria for prioritization of mitigation activities.

**Funds Requested:** $774,000

**Proposed Project Completion:** 2026-06-30

**LCCMR Funding Category:** Foundational Natural Resource Data and Information (A)

## **Project Location**

**What is the best scale for describing where your work will take place?** Region(s): NE, Central, NW,

**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.**

Black ash wetlands are an extensive and ecologically significant part of Minnesota’s landscapes, covering approximately 1.2 million acres in the northern forested region. Black ash wetlands are seriously threatened by EAB, which causes complete mortality of black ash following infestation.
We have been assessing the potential impacts of emerald ash borer (EAB) in black ash wetlands for ten years, using a combination of experimental studies (Phase 1) and monitoring sites across the state (Phase 2) that were established with previous allocations from the Environment and Natural Resources Trust Fund (ENRTF). Our proposed Phase 3 project focuses on mitigation of the threat from EAB and will utilize our previous work and conduct new research to develop and prioritize strategies to minimize EAB impacts in the northern forested region of the State. Given the history of ENRTF support for this work and expertise of the project team, we are uniquely poised to generate meaningful solutions to addressing the challenges posed by the threat of EAB to black ash wetlands and associated wildlife resources. This proposal was tentatively recommended for funding in 2020, if the pending project is funded we will withdraw this proposal from consideration for 2021.

**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 will identify strategies that maintain critical services and benefits currently provided by black ash wetlands. Our objectives are to:

- Quantify long-term impact of EAB on water, timber resources, vegetation, wildlife and carbon. Many black ash forests will not be actively managed or monitored, yet it is imperative to understand impacts to forest resources following EAB. The experimental sites from our previous work are at a critical point in development; it is important we utilize these previous investments to understand what happens next and forecast longer-term impacts.

- Develop a refined list of suitable replacement tree species and establishment practices to maintain black ash wetlands in a forested condition. Current recommendations are limited and do not include assessment of practices to improve overall growth and survival of replacement trees beyond the first several years. Managers urgently need more information to ensure planting success across a wide range of site conditions.

- Establish site susceptibility metrics and prioritization criteria for mitigation activities. Actual impacts of EAB on black ash wetlands will vary, and we need easily measured and understandable indicators on what the impacts will be on a site by site basis, and where mitigation efforts will be most effective.

**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?**

Our results to date indicate that black ash loss will change site hydrology and water quality, alter forest structure and vegetation dynamics, and reduce habitat with impacts to wildlife species. Mitigation may be possible at some sites using a combination of management practices and planting of alternative tree species. However, we need more information in order to prioritize what actions we should take and where we should take them to have the greatest success in mitigating EAB impacts. Our proposed research will provide this information, allowing managers to act and mitigate impacts to black ash wetland ecosystems.

## **Activities and Milestones**

### **Activity 1: Determine long-term impacts of EAB on wetland ecosystem functions.**

**Activity Budget:** $300,000

**Activity Description:**We will continue to assess impacts of simulated EAB at a large scale experimental study (Phase 1) established in 2010, and monitor baseline conditions across a wide range of black ash forests established in Phase 2 of the project. These measurements include 1) continuous measurement of water table dynamics (all Phase 1 sites and a subset of Phase 2 sites), 2) annual assessments of wildlife presence and abundance (all sites), 3) measurement of all vegetation including dominant trees, shrubs, and plant communities (all sites), and measurement of above- and below ground carbon pools. Results will be used to determine EAB effects on site hydrology, wildlife, trees and vegetation, and carbon storage and sequestration. All Phase 2 monitoring sites will be re-measured, and data combined with Phase I results to estimate long-term impacts of EAB on water, wildlife, vegetation, and carbon.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Statewide impacts of black ash loss estimated | 2025-06-30 |
| Long-term site-level impacts to water, wildlife, vegetation, and carbon quantified | 2025-12-31 |

### **Activity 2: Replacement tree species and practices to maintain wetland forests**

**Activity Budget:** $305,000

**Activity Description:**We will measure survival and growth of 12 tree species planted in 2010 as part of Phase 1. These findings and others will be used to identify a subset of promising target species for more intensive test practices to improve establishment and growth. The intensive practices we will assess include the use of browse control, planting of larger seedling stock than typically used, and practices to control competing vegetation. . Target species and intensive practices will be implemented at 15 of the monitoring sites established across northern MN as part of the Phase 2 project, and also at 10 additional sites located on partner organization lands. Survival and growth of target species will be measured annually, and effectiveness of the intensive establishment practices will be determined and recommendations made at projects end.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Survival and growth assessment of Phase 1 replacement species completed | 2021-12-31 |
| New tree species planted and establishment practices implemented at Phase 2 sites | 2022-06-30 |
| Final recommendations on optimal species and practices to maintain wetland forests | 2026-06-30 |

### **Activity 3: Site susceptibility criteria and prioritization of mitigation actions**

**Activity Budget:** $169,000

**Activity Description:**We will utilize findings from Activity 1 to identify easily measured site characteristics that can be used to predict the relative impact of EAB on water, vegetation, wildlife, and carbon. We will utilize findings from Activities 1 and 2 combined with other relevant data (e.g., proximity to mills, volume, site access) to determine which sites have a greatest likelihood of mitigation success and management action. These data will be combined with a map of black ash developed during Phase 2 to rank all stands and identify priority locations for mitigation activities. We will develop recommendations on a coordinated statewide response to mitigate EAB impacts in ash wetlands.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Site susceptibility metrics for water, vegetation, wildlife, and carbon established | 2025-12-31 |
| Spatially referenced prioritization tool completed | 2026-03-31 |
| Recommendations on statewide/ multi-ownership prioritization framework | 2026-06-30 |

## **Project Partners and Collaborators**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Organization** | **Role** | **Receiving Funds** |
| Dr. Rob Slesak | Minnesota Forest Resources Council | Dr. Slesak will continue to lead all aspects of the project related to wetland hydrology and soil, contributing to each of the activities outlined in this proposal. Slesak will also supervise research associates, mentor graduate students, and engage with stakeholders and external partners through the Minnesota Forest Resources Council. | No |
| Dr. Tony D’Amato | University of Vermont | Primarily responsible for Activity 2, including translating research findings into management guidance to minimize impacts of black ash loss on forest hydrology and diversity. Also contributes to Activities 1 and 3 through assistance with analyses and translation of findings to outreach materials. | No |
| Dr. Brian Palik | USDA Forest Service-Northern Research Station | Primarily responsible for Activity 2, including maintaining Phase I sites and replacement tree evaluation activities in Phase I and II sites. Contributes to Activity 1 through measurements of vegetation and logistic support at Phase I and II sites. | 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 research is of great interest to all stakeholders in the forest resources and management communities as project results will be used to actively address the EAB threat that these communities face. We will engage directly with practitioners and policy makers in natural resource management to communicate key messages, provide assessment tools, and deliver broad recommendations. The project team has extensive experience working with these audiences, including numerous workshops, presentations, and reports as part of earlier, related projects on EAB and black ash funded by the ENRTF. We are committed to pursuing support from both state and federal sources.

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

|  |  |  |
| --- | --- | --- |
| **Name** | **Appropriation** | **Amount Awarded** |
| Conserving Minnesota’s Forest Birds of Management Concern | M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 03g | $500,000 |
| Mapping Avian Movement in Minnesota | M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 03h | $200,000 |
| Determine Impacts on Wildlife From Emerald Ash Borer Infection of Black Ash Forests | M.L. 2016, Chp. 186, Sec. 2, Subd. 03q | $334,000 |
| Evaluation of Tree Retention Guidelines Pertaining to Wildlife | M.L. 2016, Chp. 186, Sec. 2, Subd. 03p | $232,000 |

## **Project Manager and Organization Qualifications**

**Project Manager Name:** Alexis Grinde

**Job Title:** Wildlife Ecologist

**Provide description of the project manager’s qualifications to manage the proposed project.**Dr. Grinde is a Wildlife Ecologist and Research Lab Manager at the Natural Resources Research Institute, University of Minnesota Duluth. She has over 15 years of research experience focusing on conservation ecology. Dr. Grinde manages five full-time research scientists and multiple research projects and contracts focusing on the development of management strategies for habitats and wildlife. Her research focuses on conservation ecology including studying the large-scale impacts of environmental change on wildlife, biodiversity, and ecosystem functions. Applications of her research include informing forest management decisions in relation to changing land use patterns and providing recommendations for conservation plans for species of conservation concern. Dr. Grinde was the lead PI for the ENTRF project “Determine Impacts on Wildlife From Emerald Ash Borer Infection of Black Ash Forests”.

**Organization:** U of MN - Duluth - NRRI

**Organization Description:**The Natural Resources Research Institute (NRRI) is an applied research and economic development engine for the University of Minnesota research enterprise. NRRI employs over 130 scientists, engineers and technicians to deliver on its mission 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.
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.
The NRRI Avian Ecology Lab is led by Dr. Alexis Grinde (over 15 years of wildlife and education experience) and consists of five full-time research scientists. Our research focuses on the development of economically sustainable conservation strategies and land management guidelines to preserve and enhance the species diversity of Minnesota bird populations and to protect species of conservation concern.

## **Budget Summary**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Category / Name** | **Subcategory or Type** | **Description** | **Purpose** | **Gen. Ineli gible** | **% Bene fits** | **# FTE** | **Class ified Staff?** | **$ Amount** |
| **Personnel** |  |  |  |  |  |  |  |  |
| Alexis Grinde, Wildlife Ecologist |  | Principal investigator; Project management and coordination. |  |  | 26.7% | 0.55 |  | $70,879 |
| Research Associate (P&A) |  | Project management and data acquisition for carbon, vegetation, tree replacement, and hydrology portions of the project. |  |  | 26.7% | 4 |  | $236,274 |
| Research Scientists |  | Project management, data acquisition and analysis for wildlife portion of the project. |  |  | 24.1% | 0.85 |  | $62,929 |
| Graduate student 2 (carbon stocks) |  | Graduate research associate position for carbon stocks portion of the project. 2 years (salary, fringe, and tuition reimbursement). |  |  | 46.1% | 1 |  | $92,730 |
| Graduate student 1 (tree replacement) |  | Graduate research associate position for tree replacement portion of the project. 2 years (salary, fringe, and tuition reimbursement). |  |  | 46.1% | 1 |  | $92,730 |
| Graduate student 3 (wildlife) |  | Graduate research associate position for wildlife portion of the project. 2 years (salary, fringe, and tuition reimbursement). |  |  | 46.1% | 1 |  | $92,730 |
| Undergraduate students- field technicians |  | Assist with data collection. Three summer work study students (3 each for 2 years). |  |  | 0% | 1.7 |  | $41,465 |
|  |  |  |  |  |  |  | **Sub Total** | **$689,737** |
| **Contracts and Services** |  |  |  |  |  |  |  |  |
| USDA Forest Service-Northern Research Station | Sub award | Primarily responsible for maintaining Phase I sites and replacement tree evaluation activities in Phase I and II sites. These are costs incurred by the USFS when work is being conducted by USFS personnel (in kind) and by UMN staff who will be housed at the USFS research station. |  |  |  | 0 |  | $30,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$30,000** |
| **Equipment, Tools, and Supplies** |  |  |  |  |  |  |  |  |
|  | Tools and Supplies | Vegetation and and carbon measurements and analysis including Hagloff height/distance equipment ($600), tree calipers ($300), volumetric soil samplers ($997), supplies for sampling frames and litter collection ($740), soil temperature sensors ($1,365), wildlife survey equipment ($6,526) and C and N measurements ($12,500). | This equipment is needed for field measurements and monitoring. |  |  |  |  | $23,028 |
|  | Tools and Supplies | Replacement water table sensors (25 total - $10,000, $400/each) at experimental study (Phase 1) | Used to monitor changes in hydrology in research sites. |  |  |  |  | $10,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$33,028** |
| **Capital Expenditures** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Acquisitions and Stewardship** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Travel In Minnesota** |  |  |  |  |  |  |  |  |
|  | Miles/ Meals/ Lodging | Mileage (75%) and lodging (25%) for frequent travel to experimental sites from Phase 1 and among 30 monitoring sites from Phase 2 per UMN travel policy (3% inflation rate). $4000 per year (Lodging + per diem= 12 nights @ $110.00 / night = $1320; Mileage 4660 miles @ .575/ mile (U of M rate) = $2680) \* 5 years of surveys. | Travel costs associated with field work. |  |  |  |  | $21,235 |
|  |  |  |  |  |  |  | **Sub Total** | **$21,235** |
| **Travel Outside Minnesota** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Printing and Publication** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Other Expenses** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
|  |  |  |  |  |  |  | **Grand Total** | **$774,000** |

### **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 | $367,303 |
| In-Kind | USDA Forest Service-Northern Research Station | The FS-NRS estimates in-kind support for the proposed project to be $400,000. This includes in-kind salary + fringe for each year of the project (0.25 FTE Palik; 0.25 FTE technician), as well as in-kind use of Forest Service ATV and trailer and office and laboratory space. In addition, an existing black ash EAB adaption experiments on the Chippewa National Forest that will be used in this project are supported by operating funds (~$40,000/year) of the USDA Forest Service Northern Research Station. See attached letter. | Secured | $400,000 |
| In-Kind | University of Vermont | The in-kind support will be provided by the University of Vermont for Anthony D'Amato's in-kind salary + fringe for each year of the project (0.10 FTE). See attached letter. | Secured | $68,600 |
|  |  |  | **Non State Sub Total** | **$835,903** |
|  |  |  | **Funds Total** | **$835,903** |

## **Attachments**

### **Required Attachments**

#### **Visual Component**

File: [0736ed07-08f.pdf](https://lccmrprojectmgmt.leg.mn/media/map/0736ed07-08f.pdf)

#### **Alternate Text for Visual Component**

Visual shows pictures of the ongoing large-scale experiment we will utilize, potential replacement tree species, and a map showing the extent of ash across the state.

### **Optional Attachments**

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

|  |  |
| --- | --- |
| **Title** | **File** |
| USDA FS-NRS In-kind letter | [f70a0d9f-bd2.doc](https://lccmrprojectmgmt.leg.mn/media/attachments/f70a0d9f-bd2.doc) |
| University of Vermont In-kind letter | [eeecc363-3c8.doc](https://lccmrprojectmgmt.leg.mn/media/attachments/eeecc363-3c8.doc) |
| Sponsored Projects Approval Letter | [31eb5588-ace.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/31eb5588-ace.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?**
 Yes

**Does the organization have a fiscal agent for this project?**
 No