



Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2020 ENRTF Work Plan (Main Document)

Today's Date: February 11, 2020

Date of Next Status Update Report: April 1, 2021

Date of Work Plan Approval:

Project Completion Date: June 30, 2025

Does this submission include an amendment request? _N/A_

PROJECT TITLE: EAB and black ash: maintaining forests and benefits

Project Manager: Robert Slesak

Organization: University of Minnesota

College, Department, or Division: Dept. Forest Resources

Mailing Address: 10b Green Hall, 1530 Cleveland Avenue N

City, State, Zip Code: St. Paul, MN 55108

Project Manager Direct Telephone Number: 651-603-6756

Email Address: raslesak@umn.edu

Web Address:

Location: Statewide

Total Project Budget: \$700,000

Amount Spent: \$0

Balance: \$700,000

Legal Citation: M.L. 2020, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

PROJECT STATEMENT:

We have been assessing the potential impacts of emerald ash borer (EAB) in black ash wetlands for eight 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 focuses on mitigation, and will utilize our previous work and conduct new research to develop prioritization 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.

Black ash wetlands are seriously threatened by EAB, which causes complete mortality of black ash following infestation. Black ash wetlands are an extensive and ecologically significant part of Minnesota's landscapes, covering approximately 1 million acres in the northern forested region. These wetlands are unique because they are composed almost entirely of black ash, making them very susceptible to the impacts of EAB. 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. Widespread forest loss and conversion to a wetter, marsh-like condition is likely across the state with loss of habitat for dependent wildlife species and likely reductions in levels of carbon stored in these areas.

Based on our previous research, mitigation may be possible at some sites using a combination of management practices and planting of alternative replacement 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 to our northern forested wetlands.** This includes identifying strategies that maintain habitat and carbon benefits currently provided by black ash wetlands. Our objectives are to:

- **Quantify the long-term impact of EAB on water, hydrology, wildlife and carbon.** Many black ash forests will not be actively managed, and it is imperative to understand impacts to these forest resources following EAB. The experimental sites from our previous work are at a critical point in development, and it is important that we utilize these previous investments to understand what happens next and forecast longer-term impacts.
- **Develop a refined list of most suitable replacement tree species and establishment practices to maintain black ash wetlands in a forested condition.** Current recommendations are limited in scope and do not include assessment of practices to improve overall growth and survival 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.

II. OVERALL PROJECT STATUS UPDATES:

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

Fourth Update October 1, 2022

Fifth Update April 1, 2023

Sixth Update October 1, 2023

Seventh Update April 1, 2024

Eighth Update October 1, 2024

Ninth Update April 1, 2025

Final Report between project end (June 30) and August 15, 2025

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1 Title: Determine long-term impacts of EAB on wetland ecosystem functions

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. 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 1 ENRTF BUDGET: \$ 300,000

Outcome	Completion Date
1. Long-term site-level impacts to water, wildlife, vegetation, and carbon quantified	Dec. 2024
2. Statewide impacts of black ash loss estimated	June 2025

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

Fourth Update October 1, 2022

Fifth Update April 1, 2023

Sixth Update October 1, 2023

Seventh Update April 1, 2024

Eighth Update October 1, 2024

Ninth Update April 1, 2025

Final Update between June 30, 2025 and August 15, 2025

ACTIVITY 2 Title: Replacement tree species and practices to maintain wetland forests

Description: We will measure survival and growth of 12 tree species planted in 2010 as test candidates in Phase 1. These findings and others will be used to identify a subset of target species for

more intensive test practices to improve establishment and growth (browse protection, large planting stock size, competition control). Target species and intensive practices will be implemented at 20 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 establishment practices will be determined and recommendations made at projects end.

ACTIVITY 2 ENRTF BUDGET: \$ 250,000

Outcome	Completion Date
1. Survival and growth assessment of Phase 1 replacement species completed	Dec. 2020
2. New tree species planted and establishment practices implemented at Phase 2 sites	June 2021
3. Final recommendations on optimal species and practices to maintain wetland forests	June 2025

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

Fourth Update October 1, 2022

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Ninth Update April 1, 2025

Final Update between June 30, 2025 and August 15, 2025

ACTIVITY 3 Title: Site susceptibility criteria and prioritization of mitigation actions

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 Activity 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. We will develop recommendations on a coordinated statewide response to mitigate EAB impacts in ash wetlands.

ACTIVITY 3 ENRTF BUDGET: \$ 150,000

Outcome	Completion Date
1. Site susceptibility metrics for water, vegetation, wildlife, and carbon established	Dec. 2024
2. Spatially referenced prioritization tool completed	Mar. 2025
3. Recommendations on statewide/ multi-ownership prioritization framework	June 2025

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Sixth Update October 1, 2023

Seventh Update April 1, 2024

Eighth Update October 1, 2024

Ninth Update April 1, 2025

Final Update between June 30, 2025 and August 15, 2025

IV. DISSEMINATION:

Description:

All reports and assessment tools will be made publicly available on the Department of Forest Resources Website (www.forestry.umn.edu). A final report will document impacts of EAB and make recommendations for mitigation, including ideal species for planting and related practices for successful forest diversification. Several manuscripts will be written based on this research and submitted for publication in peer-reviewed journals.

We will engage directly with practitioners and policy makers in natural resource management to communicate key messages, the assessment tools, and broad recommendations. The project team has extensive experience working with these audiences and other forest stakeholders, including numerous workshops, presentations, and reports as part of earlier, related projects on EAB and black ash funded by the ENRTF. We will continue these efforts in close cooperation with the Sustainable Forests Education Cooperative and with our project partners including the DNR, the USDA Forest Service, the Leech Lake band of Ojibwe, Fond du Lac Band of Lake Superior Chippewa, and the MN Association of County Land Commissioners.

The Minnesota Environment and Natural Resources Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the [ENRTF Acknowledgement Guidelines](#).

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Eighth Update October 1, 2024

Ninth Update April 1, 2025

Final Update between June 30, 2025 and August 15, 2025

V. ADDITIONAL BUDGET INFORMATION:

A. Personnel and Capital Expenditures

Explanation of Capital Expenditures Greater Than \$5,000: N/A

Explanation of Use of Classified Staff: N/A

Total Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 10 FTEs

Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: N/A

VI. PROJECT PARTNERS:

A. Partners outside of project manager's organization receiving ENRTF funding

Name	Title	Affiliation	Role
Brian Palik	Program Leader	USDA Forest Service	Co Principle Investigator
Alexis Grinde	Wildlife Ecologist	NRRI	Co Principle Investigator

B. Partners outside of project manager's organization NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Tony D'Amato	Professor	University of Vermont	Co Principle Investigator

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

This issue and our research is of great interest to everyone in the forest resources community, and the information from this project will be used to actively address the EAB threat. We will engage directly with practitioners and policy makers in natural resource management to communicate key messages, assessment tools, and broad recommendations. The project team has extensive experience working with these audiences and other forest stakeholders, including numerous workshops, presentations, and reports as part of earlier, related projects on EAB and black ash funded by the ENRTF. We expect that additional funding will be required in the future, and are committed to pursuing support from both state and federal sources.

VIII. REPORTING REQUIREMENTS:

- Project status update reports will be submitted April 1 and October 1 each year of the project
- A final report and associated products will be submitted between June 30 and August 15, 2025

IX. SEE ADDITIONAL WORK PLAN COMPONENTS:

A. Budget Spreadsheet

B. Visual Component or Map

C. Parcel List Spreadsheet

D. Acquisition, Easements, and Restoration Requirements

Attachment A: Project Budget Spreadsheet
 Environment and Natural Resources Trust Fund
 M.L. 2020 Budget Spreadsheet

Legal Citation:

Project Manager: Robert Slesak

Project Title: EAB and black ash: maintaining forests and benefits

Organization: University of Minnesota

Project Budget: 700,000

Project Length and Completion Date: 5 years; June 30, 2025

Today's Date: February 11, 2019

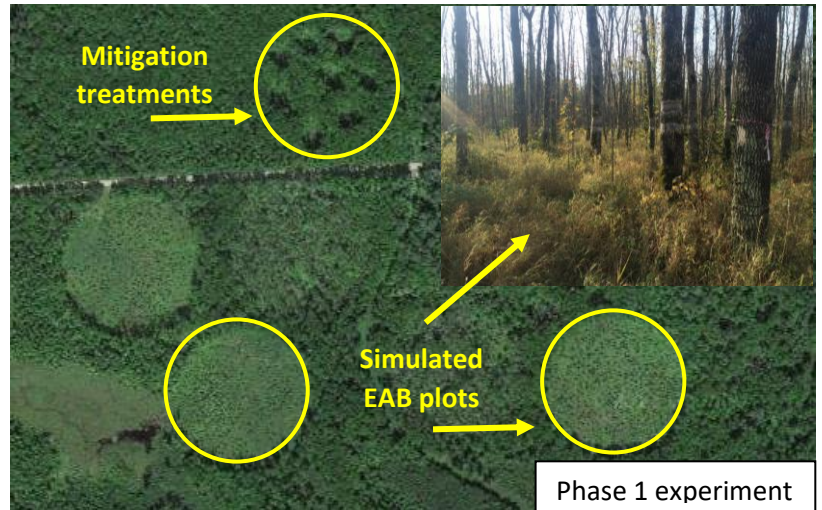


ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
7745.5				
Personnel (Wages and Benefits)		\$ 629,738		\$ 629,738
Research Associate - Salary (1 FTE) and fringe (0.36) for 4 years for project management, logistics, data acquisition		\$ 233,920	\$ -	\$ 233,920
Research Scientist - Salary (0.1 FTE) and fringe (0.295) for 5 years (wildlife)		\$ 36,653	\$ -	\$ 36,653
Graduate student 1 (carbon stocks) - Salary (0.5 FTE) and fringe (0.161) + \$20.50/hr tuition for 2 years		\$ 92,691	\$ -	\$ 92,691
Graduate student 2 (replacement species) - Salary (0.5 FTE) and fringe (0.161) + \$20.50/hr tuition for 2.75 years		\$ 124,709	\$ -	\$ 124,709
Graduate student 3 (wildlife responses) - Salary (0.5 FTE) and fringe (0.161) + \$20.50/hr tuition for 2 years		\$ 84,785	\$ -	\$ 84,785
Salary and fringe (0.082) for 2 summer work study students (2 each year for 2 years)		\$ 34,162	\$ -	\$ 34,162
Field technician - salary (0.1 FTE) and fringe (0.082) for 5 years (wildlife measures)		\$ 22,818	\$ -	\$ 22,818
Equipment/Tools/Supplies				
Replacement water table sensors (25 total - \$12,000) at experimental study (Phase 1)		\$ 12,000	\$ -	\$ 12,000
Vegetation and and carbon measurments 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 (\$1,865), wildlife survey equipment (\$2,260) and lab analytical measurements for C and N (\$12,500).		\$ 19,262	\$ -	\$ 19,262
Professional/Technical/Service Contracts				
USDA Forest Service Northern Research Station contract includes: 1) Dedicated field vehicle for in-kind NRS field staff and UMN staff located on site during field season (\$19,000-FOR +mileage); 2) in State travel costs (per diem and lodging) for periodic overnight trips by NRS field staff and co-PIs (\$4,000) 3) Misc. field supplies needed on site (\$4000).		\$ 27,000	\$ -	\$ 27,000
			\$ -	
Travel expenses in Minnesota				
Mileage (75%) and lodging (25%) for frequent travel to experiemental sites from Phase 1 and among 30 monitoring sites from Phase 2 per UMN travel policy		\$ 12,000	\$ -	\$ 12,000
Other				
		\$ -	\$ -	\$ -
COLUMN TOTAL		\$ 700,000	\$ -	\$ 700,000
SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT	Status (secured or pending)	Budget	Spent	Balance
Non-State:		\$ -	\$ -	\$ -
State:		\$ -	\$ -	\$ -
In kind: R. Slesak (0.1 FTE each year for 5 years) (63,000) + Univerity of Minnesota unrecovered Facilities and Administration costs (54%) (348,883)	Secured	\$ 411,883	\$ -	\$ 411,883
In kind: A. D'Amato (0.05 FTE each year for 5 years; \$42,105)	Secured	\$ 42,105	\$ -	\$ 42,105
In kind: A. Grinde (0.05 FTE each year for 5 years; \$33650)	Secured	\$ 33,650	\$ -	\$ 33,650
In kind: USDA Forest Service B. Palik (0.1 FTE each year for 5 years; \$95,000), field technician (0.1 FTE each year for 5 years, \$49,000), facilities and administrative costs (\$7,500)	Secured	\$ 151,500	\$ -	\$ 151,500
Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS	Amount legally obligated but not yet spent	Budget	Spent	Balance
Ecological and Hydrological Impacts of Emerald ash borer. June 2009-2015. M.L. 2010, Chp. 362, Sec. 2, Subd.6b		\$ 636,000	\$ 636,000	\$ -
Emerald ash borer ecological and hydrological impacts - Phase II. June 2015-2020. M.L.		\$ 400,000	\$ 390,000	\$ 10,000
Determine Impacts on Wildlife From Emerald Ash Borer Infection of Black Ash Forests. June 2016-2019. M.L. 2016, Chp. 186, Sec. 2, Subd. 03q		\$ 334,000	\$ 334,000	\$ -

Objective: provide practical information on what actions to take to mitigate impacts of EAB in black ash wetlands and identify areas where management efforts will be most effective to maintain wetland forests and their benefits

Activity 1: Utilize Phase 1 and 2 plots to determine long term impacts on:

- Hydrology / water quality
- Vegetation / biodiversity
- Wildlife habitat and species
- Carbon storage and dynamics



Swamp white oak



Northern white cedar

Activity 2: identify optimal replacement tree species to diversify black ash forests

Identify practices to increase survival and growth needed for successful conversion:

- Competition / browse control
- Seedling stock size / condition
- Planting site location / modification

Activity 3: identify site conditions and locations where mitigation efforts will be most effective (prioritization)

- Sites with greatest potential for diversification success
- Conditions where ecological impacts are greatest
- Locations which can be feasibly managed and treated

