

Environment and Natural Resources Trust Fund 2020 Request for Proposals (RFP)

Project Title:**ENRTF ID: 250-FH**

Impacts from Larch Beetle to Forests and Wildlife

Category: H. Proposals seeking \$200,000 or less in funding**Sub-Category:** F. Methods to Protect, Restore, and Enhance Land, Water, and Habitat**Total Project Budget:** \$ 195,107**Proposed Project Time Period for the Funding Requested:** June 30, 2023 (3 yrs)**Summary:**

Larch beetle has damaged nearly half of Minnesota's tamarack forest. The ecological impacts are unknown. We propose surveying tree and bird populations to assess their response to widespread tree mortality.

Name: Mike Reinikainen**Sponsoring Organization:** MN DNR**Job Title:** Silviculture Coordinator**Department:** Division of Forestry**Address:** 500 Lafayette Rd.
St. Paul MN 55155**Telephone Number:** (651) 259-5270**Email** mike.reinikainen@state.mn.us**Web Address:** www.dnr.state.mn.us/forestry/ecs_silv/index.html**Location:****Region:** Northwest, Northeast**County Name:** Aitkin, Beltrami, Itasca, Koochiching, Lake of the Woods, Roseau, St. Louis**City / Township:****Alternate Text for Visual:**

Evaluating Forestry Tools for Conserving Minnesotas Tamarack Forests. The handout uses iconography to briefly describe the ecological problems caused by a eastern larch beetle and possible forest management tools to help restore tamarack.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity	_____ Readiness	_____ Leverage	_____ TOTAL _____%



Environment and Natural Resources Trust Fund (ENRTF) 2020 Main Proposal

30 word description: Larch beetle has damaged nearly half of Minnesota's tamarack forest. The ecological impacts are unknown. We propose surveying tree and bird populations to assess their response to widespread tree mortality.

PROJECT TITLE: Impacts from larch beetle to forests and wildlife

I. PROJECT STATEMENT

Nearly half of Minnesota's 1.1 million acres of tamarack forests have been damaged by the native insect, eastern larch beetle (ELB), and **there is little data available** on the resulting impacts to ecosystem function. The current outbreak is occurring across the Upper Midwest and into Canada, and while some active research is helping us better understand how healthy tamarack forests function, **no one knows how tree and bird populations are responding to widespread tamarack mortality** caused by the eastern larch beetle. **The goal of this project** is to provide forest and wildlife managers needed information concerning plant community change and habitat quality of damaged tamarack forest. This project has two objectives aimed at restoring and conserving Minnesota's tamarack forest, and they are:

- Evaluate status of natural tree regeneration in damaged stands (Activity 1)
- Survey native bird populations to assess habitat quality of damaged stands (Activity 1)

Beetle damage and weak wood markets for tamarack make it difficult to renew these acres through harvest. ELB continues to expand in MN from Lake of the Woods to Aitkin County, resulting in significant mortality and disruption to natural tree regeneration cycles. Current forest inventory data from dead, damaged, unharvested forests are lacking. Without this information, it is difficult to justify management intervention, such as aerially seeding from helicopters – a proven method to regenerate tamarack forests when living seed trees are lacking.

We seek to renew damaged acres to maintain the myriad ecosystem and economic benefits provided by these forests. Tamarack forests are valuable for wildlife habitat, ecosystem services like clean water, and forest products like timber, fuelwood, and chemical extractives. The impact of this beetle outbreak on species, like the tamarack-dependent Connecticut warbler, and ecosystem services, such as the clean water our forested wetlands provide, are unknown. The future of tamarack, an iconic Minnesota species, is uncertain.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Assess plant and wildlife response in beetle-killed tamarack forests **ENRTF BUDGET:** \$195,107

We will identify 30 sites dominated by tamarack across ownerships. Sites will include healthy tamarack stands and stands impacted by ELB to be able to compare vegetation and wildlife habitat.

We will:

- Field inventory vegetation to determine whether tree seedlings are present that could replace dead tamarack
- Survey the bird community over the course of the season to evaluate habitat use

These activities will result in the following outcomes and products:

- Inventories will confirm whether or not regeneration, especially of tamarack, is occurring in beetle-damaged tamarack stands
- Information on overall vegetative communities and how vegetation and structure (dead standing trees and dead down trees) influence avian community use
- All findings will be summarized and shared via multiple venues including the MNDNR Division of Forestry Webpage, a regional source for forest management guidance, the SFEC Forest and Wildlife Research Review and MN Society of American Foresters conference, webinars, and peer-reviewed literature



Environment and Natural Resources Trust Fund (ENRTF) 2020 Main Proposal

Outcome	Completion Date
1. Identify 30 sample sites to conduct regeneration surveys	Feb. 2021
2. Collect data on vegetation and native bird response	Oct. 2022
3. Analyze, publish, and share findings with natural resource managers; incorporate findings into future restoration efforts	June 2023

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Mike Reinikainen, Silviculture Coordinator, MNDNR, Division of Forestry, project manager and delivery
Paul Dubuque, Silviculture Consultant, MNDNR, Division of Forestry, site selection, technical adviser, and delivery
Dr. Windmuller-Campione, Assistant Professor, University of Minnesota, data collection, analysis, and delivery
Dr. Alexis Grinde, Wildlife Ecologist, Natural Resources Research Institute, data collection, analysis, and delivery

B. Partners NOT receiving ENRTF funding

Richard Moore, County Land Commissioner, Beltrami County, providing sites
Danae Schafer, Assistant County Land Commissioner, Koochiching County, providing sites
Sawyer Scherer, Forest Ecologist, UPM Blandin, providing sites

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:

Results will be incorporated into MNDNR Division of Forestry's (DOF) tamarack forest management guidelines as it will represent the most robust source of information describing how these damaged tamarack forests are changing post-beetle infestation. The DOF has the capacity to implement these findings into our aerial seeding regeneration projects should intervention be required to ensure tamarack forests are regenerating after infestation. Further, we can track sites long-term using our enterprise geodatabase. Future reforestation funding if needed will be requested through the legislative process.

Results will influence how State, County, and Industry manage their vast tamarack resource in the wake of this unprecedented state-wide outbreak.

To ensure results are known and implemented both inside and outside of the partnering agencies, results will be delivered to regional natural resource managers through conferences (USFS Forest Health Workshop and SFEC Forest and Wildlife Research Review), webinars, and the MNDNR Forest Management Academy.

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

Legal Citation:

Project Manager: Mike Reinikainen

Project Title: Impacts from larch beetle to forests and wildlife

Organization: MN DNR Division of Forestry

Project Budget: \$195,107

Project Length and Completion Date: 3 years, June 2023

Today's Date: 4/15/2019



ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
BUDGET ITEM				
Personnel (Wages and Benefits)		\$ 48,000		
MNDNR: 2 field interns for 200 hours for 2 summers, collect field data to complete vegetation surveys on 30 sites, \$12,000 (93% salary, 7% fringe) 19% FTE each year for 2 years				
MNDNR: Mike Reinikainen, Silv. Program Coord., project manager, coordinate amongst partners, incorporate findings into DNR management guidelines, \$12,000 (67% Salary, 33% Fringe) 4% FTE each year for 3 years				
MNDNR: Paul Dubuque, Silv. Program Consult., site selection, incorporating findings into DNR management guidelines, \$12,000 (68% Salary, 32% Fringe), 4% FTE each year for 3 years				
MNDNR: TBD, Regional Forest Health Specialist, site selection, interpretation of results, \$6,000 (67% Salary, 33% Fringe), 2% FTE each year for 3 years				
MN DNR: TBD, Regional ECS Forest Ecologist, site selection, data entry and analysis, interpretation of results, \$6,000 (67% Salary, 33% Fringe), 2% FTE each year for 3 years				
Professional/Technical/Service Contracts		\$ 127,422		
Vegetation surveys, single-source contract with U of M: 1 Researcher, site selection, data collection, data analysis, and product delivery related to vegetation surveys, \$70,560, 100% FTE each year for 2 years				
Vegetation surveys, single-source contract with U of M: Marcella Windmuller-Campione, PhD., supervision and direction for research related to vegetation surveys, \$11,780, 4% FTE each year for 2 years				
Vegetation survey, travel expenses for U of M: travel for field work estimated at 2 vehicles over two years for 50 days of field work for 5 field technicians (estimated cost for mileage, 70%; estimated cost for lodging and per diem, 30%), \$5,000. Travel and registration for local conference including MN SAF, the Sustainable Forest Education Cooperative, and Forest Health Conference to share results. Estimated at 2 conferences for the 2 years, \$2,500				
Bird surveys, single-source contract with NRRI: TBD, Research Scientists/Field Techs (2), data collection, data analysis, and product delivery related to bird surveys, \$14,013, 5% FTE each year for 2 years				
Bird surveys, single-source contract with NRRI: Alexis Grinde, PhD, supervision and direction for research related to bird surveys, \$9,577, 4% FTE each year for 2 years				
Bird surveys, single-source contract with NRRI: Graduate Research Assistant (summer only), data collection and crew supervision, \$5,992, 25% FTE each year for 2 years				
Bird surveys, equipment/tools/supplies for NRRI: \$5,000; 5 Digital Audio Recorders (DARs, 25 DARs will be used from previous research projects) @ \$950 each (\$4,750), batteries and SD cards (\$250)				
Bird survey, travel expenses for NRRI: travel for fieldwork and planning meetings, \$3,000, including mileage (75%) and lodging (25%) for researchers. Mileage will be reimbursed at \$0.545/mile (University of MN rate). Lodging is estimated between (\$90-\$130 per night)				
Equipment/Tools/Supplies		\$ 2,400		
MN DNR: forestry field equipment for vegetation surveys, \$2,400				
Travel expenses in Minnesota		\$ 10,000		
MN DNR: \$8,000 for travel vegetation and wildlife field work estimated at 2 vehicles over two years for 50 days of field work for 4 field technicians and project partners. Estimated cost for mileage (70%) and lodging and per diem (30%). Travel will follow MN DNR or U of MN policy. \$2,000 for travel and registration for local conference travel including MN SAF, the Sustainable Forest Education Cooperative, and Forest Health Conference to share results. Estimated at 2 conferences for the 2 years.				
DNR's direct and necessary costs: (~\$7,285 total) pay for activities that are directly related to and necessary for accomplishing appropriated programs/projects. Direct and necessary costs cover People Support (~\$1,134), Safety Support (~\$205), Financial Support (~\$723), Communication Support (~\$1,388), IT Support (~\$2,698), Planning Support (~\$1,138)		\$ 7,285		
COLUMN TOTAL		\$ 195,107		
SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT				
	Status (secured or pending)	Budget	Spent	Balance
Non-State: USDA Forest Service Forest Health and Monitoring Grant, "What's alive? Understanding the relationship between eastern larch beetle and tamarack regeneration" to explore vegetation response to larch beetle on 30 additional sites.	Pending (selected for funding, not yet awarded)	\$ 50,140		
State:		\$ -		
In kind: MN DNR Argo, tracked vehicle for accessing wet sites 50 days at \$100/day	Secured	\$ 5,000		
Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS				
	Amount legally obligated but not yet spent	Budget	Spent	Balance
		\$ -	\$ -	\$ -

EVALUATING FORESTRY TOOLS FOR

Conserving Minnesota's Tamarack Forests

THE PROBLEM

Minnesota is experiencing a 17-year eastern larch beetle (ELB) outbreak that is devastating our unique tamarack forests. These forests are valuable for habitat, clean water, and forest products. ELB continues to expand, and the future of mature tamarack forests, an iconic Minnesota forest type, is uncertain.

SCALE

440k

Over **440,000 acres of tamarack have been affected** by ELB in an outbreak spanning 17 years. Over half of those acres belong to The State of Minnesota.

HABITAT



Tamarack provides critical habitat for many **Species of Greatest Conservation Need** including the Connecticut warbler, olive-sided flycatcher, bog copper butterfly, and northern bog lemming.

REGENERATION



There is concern that **tamarack may not be replacing itself** because mature trees are killed before they produce seed to grow the next generation of tamarack trees -- this could mean large losses of forest.

“We’ve never recorded an outbreak like this before,” said Brian Schwingle, a forest health specialist with the Minnesota Department of Natural Resources. “It’s unprecedented.”

THE STAR TRIBUNE, 8/13/2017

THE SOLUTION

SURVEY and determine the habitat quality of dead and damaged tamarack forests.

RESTORE tamarack where it is not replacing itself.

PRODUCE seed to secure the future of tamarack in Minnesota.

Project Co-Managers: Paul Dubuque / Mike Reinikainen

Affiliation: Silviculture Program Consultant / Coordinator, MN DNR Division of Forestry,

Mailing Address: 500 Lafayette Rd., St. Paul, MN, 55155

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Email: paul.dubuque@state.mn.us / mike.reinikainen@state.mn.us

Dubuque has worked for the DNR Division of Forestry for twenty years and is currently responsible for reforestation activities on 4.2 million acres of state forest land. He serves on several interdisciplinary forest management teams in DNR and provides program leadership to Division personnel to ensure forest management and research activities are cost effective, rooted in scientific principles, and aligned with DNR goals.

Dubuque Recent Work Experience

1998-2009	Forester
2009-2013	Ecological Classification and Silviculture Region Specialist
2014-2016	Timber Program Coordinator
2016-2017	Silviculture Program Coordinator
2017-Present	Silviculture Program Consultant

Dubuque Education

U of MN Twin Cities	St. Paul, MN, US	Forest Resource Management	B.S., 1997
USDA Forest Service	Milwaukee WI, US	Adv. Studies in Silviculture,	Certificate 2004
MN Management & Budget	St. Paul, MN	Emerging Leaders Institute,	Certificate 2011

Reinikainen has worked in forestry in the Lake States for eleven years. He has experience as a field forester working across Minnesota for State, County, and University forestry programs. He has 6 years of experience managing large-scale silviculture projects as a forester and Research Fellow with the UMN.

Reinikainen Recent Work Experience

2011	Research Fellow, Research Forester, Dept. of Forest Resources, UMN
2015	Senior Forester, Hennepin County Environment and Energy
2016	Senior Forester, Private Forest Management, MNDNR
2017	Silviculture Program Coordinator, MNDNR

Education

U of MN Twin Cities	St. Paul, MN, US	Natural Resources and Forestry	B.S., 2008
U of MN Twin Cities	St. Paul, MN, US	Applied Forest Ecology and Silviculture	M.S., 2011

Project Responsibilities

Reinikainen will assist in coordinating study design and implementation with partners. Dubuque will provide administrative support for Mike Reinikainen and the University of Minnesota Researchers. They will assist with site selection, establishing data collection procedures, and leading efforts to incorporate findings into DNR guidance and policy documents. Reinikainen and Dubuque will work with all cooperators to share findings internally and widely in Minnesota with other land managers.

Organization Description

The Minnesota Department of Natural Resources (DNR)'s mission is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. The Division of Forestry's Silviculture Program mission is to utilize forest science, expertise, experience, and tools to develop and apply site-level management plans that will meet management objectives while addressing forest health and productivity in a sustainable manner.