

**Environment and Natural Resources Trust Fund  
2017 Request for Proposals (RFP)**

---

**Project Title:**

**ENRTF ID: 026-A**

Assessing Risks to Public Benefits from Minnesota Forests

---

**Category:** A. Foundational Natural Resource Data and Information

---

**Total Project Budget:** \$ 338,000

**Proposed Project Time Period for the Funding Requested:** 2 years, July 2017 – June 2019

**Summary:**

Assess and communicate risks to public benefits from forests (e.g., from land-use change, fires), by economically valuing timber, carbon storage, clean water, and recreation. Inform forward-looking management to mitigate risks.

---

**Name:** Laura Dee

**Sponsoring Organization:** U of MN

**Address:** 1954 Buford Ave, 325 LES Bldg  
St. Paul MN 55108

**Telephone Number:** (203) 213-6956

**Email** ledee@umn.edu

**Web Address** \_\_\_\_\_

---

**Location**

**Region:** Central, Northwest, Northeast

**County Name:** Aitkin, Beltrami, Carlton, Cass, Clearwater, Cook, Crow Wing, Hubbard, Itasca, Kanabec, Koochiching, Lake, Lake of the Woods, Mille Lacs, Morrison, Roseau, St. Louis, Wadena

**City / Township:**

---

**Alternate Text for Visual:**

A conceptual diagram of aspects of the proposed project. First, we will assess and map threats to public benefits from forest (with examples here). Second, we will determine the consequences of these threats for public benefits from forests in NE, NW, and part of Central Minnesota (e.g., % changes in values under future scenarios of risk). Third, we will identify and determine management strategies that can mitigate these risks to public benefits (examples here to illustrate).

_____ 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)

2017 Main Proposal

Project Title: Assessing risks to public benefits from Minnesota forests

**PROJECT TITLE: Assessing risks to public benefits from Minnesota forests**

## I. PROJECT STATEMENT

Minnesota’s forests provide multiple benefits to over 5 million people, including timber, wildlife habitat, recreation opportunities, and improved water quality. However, forests throughout the state face increasing risks from development, extreme windstorms, heat waves, fire, and pest outbreaks (e.g., Emerald ash borer). These threats have compromised valuable benefits from forests in the past (e.g., the 1999 Blowdown decreased recreation access and timber value), and the frequency and intensity of these threats are predicted to increase in the future. **We propose to assess where and how much these threats will endanger the benefits that over 4 million acres of Northern MN forests provide to state residents and inform what can be done to mitigate these risks. A key part of this assessment will be quantifying the full suite of public benefits provided by Northern MN forests using economic valuation.** These benefits depend on how forests are managed, so we will consider how these benefits differ in state forests versus PILT and School Trust lands.

To inform forward-looking management, this project’s goals are to **1) assess risks to benefits that Northern MN forests provide to millions of MN residents, including state parks, 2) communicate the value of public benefits from forests, and 3) inform best management strategies to ensure these benefits continue to be provided in the future.** To achieve these goals, we propose three activities:

- 1) **Map risks from land-use change, windstorms, fires, heat waves, and drought to millions of acres forested lands in over 24 counties**
- 2) **Quantify multiple public benefits from forests (recreation, water quality, wildlife habitat, timber, carbon storage) using economic valuation, and assess risks to these benefits**
- 3) **Build capacity to manage these risks by disseminating results widely and identifying management approaches that reduce risk**

## II. PROJECT ACTIVITIES AND OUTCOMES

### Activity 1: Forest risk assessment

**Budget: \$ 110,000**

For all forested lands in Northern Minnesota, we will assess current and future risks due to land-use change, windstorms, fires, heat waves, and drought. We will assess threats using existing data (e.g., temperature and precipitation data from the LCCMR grant “High Resolution Climate Projections to Aid Planning Efforts”), by estimating the probability and intensity of these risks. **We will produce maps of these risks for both our focal area, Northern MN forests, and the entire state (including all 4 million acres of 58 state forests).**

Outcome	Completion Date
1. Synthesize existing data sources for future scenarios of windstorms, fires, heat waves, drought, and land-use change (i.e., a database product)	October 2017
2. Map risk data with probability and intensity of each threat	December 2017

### Activity 2: Assess consequences of risks for multiple benefits provided by forests

**Budget: \$ 120,000**

To determine the consequences of these risks for benefits from forests, we will 1) produce an economic valuation of timber products, carbon storage, water quality, and recreation, and 2) assess how scenarios of threats impact these values and wildlife habitat. For the economic valuation of water quality, we will leverage co-PI Bonnie Keeler’s existing LCCMR grant, “Informed water management: Mapping scarcity, threats, and values.” A key gap is predicting how threats will impact the value of recreation and the contribution of forests to Minnesotan cultural identity. Indeed, forests provide exceptional recreation opportunities and tourism revenue in MN. To fill this gap, we will survey MN residents using focus groups and an online-administered, survey service (Qualtrics), and analyze existing datasets on park visitations from DNR’s state park survey and MN Parks & Trails visitor counts. **We will produce 1) a report communicating estimate of public benefits from over 4 million acres of forested lands and 2) maps of these values across the scenarios of current and future threats to identify locations where public benefits face the greatest risk.**



**Environment and Natural Resources Trust Fund (ENRTF)**

**2017 Main Proposal**

**Project Title: Assessing risks to public benefits from Minnesota forests**

<b>Outcome</b>	<b>Completion Date</b>
1. Quantify value of benefits from improved water quality, carbon storage, timber, and wildlife habitat	January 2018
2. Estimate and create database on recreation value using surveys and focus groups	May 2018
3. Estimate and map consequences of risks to benefits across forested lands, producing a open-access database, risk maps, and a report	December 2018

**Activity 3: Identify and communicate management options to reduce risk to forests**

**Budget: \$ 108,000**

Information from this project will identify risk to current public benefits from forested lands and identify tools and management approaches to mitigate these risks. First, we will disseminate information about the economic value of public benefits from forests to decision-makers throughout the state. Second, we will produce a report reviewing the tools available for decision-makers to manage future risks to forests. For example, in areas facing higher risks from fire in the future, moving camp sites or thinning can reduce this risk. We will also connect our database on risks (from Activity 2) to existing tools (e.g., a tool being developed under an existing LCCMR grant led by co-PI Keeler, “Conservation Easement Assessment and Valuation System Development”). Third, we will identify areas where environmental threats (e.g., windstorms) pose a high risk to benefits. This information can help locate timber harvest in areas where benefits from leaving the forest intact have a high chance of being lost anyway.

<b>Outcome</b>	<b>Completion Date</b>
1. Disseminate information about the economic value of public benefits from forests to decision-makers throughout the state, through reports, web materials, and presentations	January 2019
2. Create report for decision-makers synthesizing which management actions are available to mitigate risks at locations with benefits facing high risk	June 2019

**III. PROJECT STRATEGY**

**A. Project Team/Partners**

This project will be led by researchers from UMN with expertise in economic valuation, forest resources, risk assessment, and modeling of environmental impacts. Dr. Laura Dee (Postdoctoral Researcher) will oversee project and conduct research, Dr. Bonnie Keeler (Lead scientist, Natural Capital Project) will be funded one month per year for ecosystem service and risk assessment, Dr. Peter Reich (Professor) will advise and assist with the forest ecosystem and resource analyses (funded one week/year). We will hire a full-time research assistant.

**B. Project Impact and Long-Term Strategy**

**This proposed work will provide a valuable risk assessment for the public benefits that forested lands provide to MN.** We will disseminate results from this project widely, including risk assessments for the current and future value from recreation, timber products, carbon storage, water quality and wildlife habitat, which face increasing environmental and development risks. **These outcomes will identify which areas (including current state investments in forested lands) are at the greatest risk and inform forward-looking management to secure public benefits for the future. To ensure impact, we will disseminate our results to decision-makers, through reports, flyers, presentations, and online materials,** including by working with the Institute on the Environment’s media team to create accessible, web-based materials that disseminate data and key research findings from the project (*see ensia.com*). This project does not require longer-term funding. To enhance the impact of LCCMR’s funding, this project complements and leverages existing LCCMR grants: “*Informed water management: Mapping scarcity, threats, and values,*” “*Conservation Easement Assessment and Valuation System Development,*” and “*High Resolution Climate Projections to Aid Planning Efforts.*”

**C. Timeline Requirements:** This project will start in July 2017 and continue until an estimated date of June 2019.

## 2017 Detailed Project Budget

Project Title: Assessing risks to public benefits from Minnesota forests

### IV. TOTAL ENRTF REQUEST BUDGET: 2 years

BUDGET ITEM	AMOUNT
<b>Personnel: Dr. Dee</b> will be employed as a Full-time (100%), 12 month appointment for a Post-doctoral Research Associate in the Department of Forest Resources. Laura Dee will be the project manager as well as perform and coordinate reasearch for Activity 1 & 2 and supervise the full time research assistant and undergraduate. Salary is \$50,000 plus \$10,375 fringe (20.75%). Estimated total \$60, 375 per year.	\$ 124,000
<b>Personnel: One week salary equivalent (1% time), in each of the two project years</b> <b>Dr. Reich</b> One week salary is \$6,285.05 + 33.7% fringe = \$8403.11 per year. Dr. Reich will assist with forest resource and risk analysis, and advise Dr. Dee.	21,000
<b>Personnel: One-month salary equivalent (8% time), in each of the two project years</b> <b>Dr. Keeler</b> to assist with ecosystem service assessment in activity #2, including ana of recreation surveys, and to assist with and advise a full-time research assistant for Activity #3. One month salary is \$7,500 + 33.7% fringe = \$10,028 per year.	20,000
<b>Personnel:</b> the team will employ an undergraduate for each summer of the project (25% time) at 6,000 for the summer salary and 7.9% fringe benefits (\$474).This student will contribute to dissemination of results for each activity, through developing webpages, reports, and flyers with information from the project.	\$ 13,000
<b>Personnel:</b> The team will employ a full-time research assistant (100% time), based at the institute on the environment, who will contribute to each activity. The first year, the research assistant will contribute to compiling a dataset and map for Activity 1, and synthesizing values of public benefits from forests for Activity 2. The second year, this person will spend their time on Activity 3 - communicating and disseminating information about the public benefits of forests, and exploring tools to improve forest health (resulting in a report). The research assistants full-time rate is \$48,000/yr with 13,152 fringe	\$ 124,000
<b>Equipment/Tools/Supplies:</b> we will publish our work in open-access journals which require publication fees (\$4000), print our work in flyers (\$1000) to disseminate to decision-makers) and present these results at a state conference (e.g., MN state water summit), requiring conference registration and travel fees (\$700).	\$ 6,000
<b>Travel/Lodging:</b> Travel and lodging to go to Northern MN to communicate with stakeholders and disseminate results	\$ 5,000
<b>Other/Surveys:</b> For activity 2, we will survey 1,500 residents in MN to determine the value of recreation across forested lands in Northern MN. We will conduct 5 focus groups (\$10,000 total), and administer 1,5000 surveys (at \$10 each) using Qualtrics oneline platform and services.	\$ 25,000
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 338,000</b>

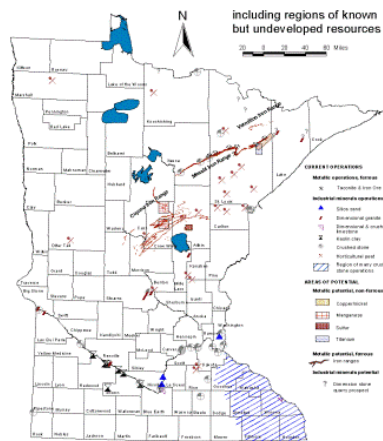
### V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
-----------------	--------	--------

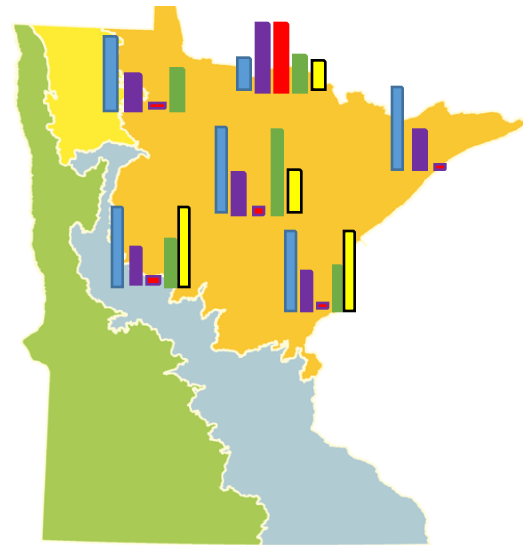
# Assess and map risks



## Mineral Industries of Minnesota



# Predicted % change in value from Northern MN forests (Example output to be done for NE, NW and part of central areas)



- Water quality
- Recreation
- Wildlife habitat
- Timber
- Carbon storage

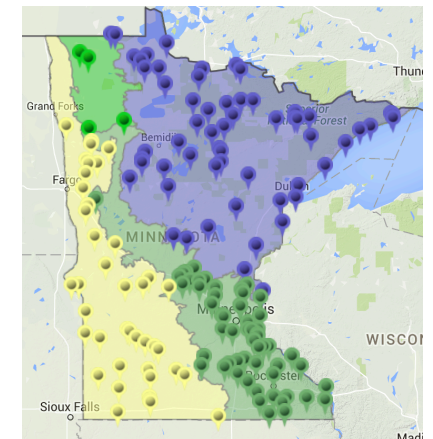
# Management options

(Examples)

## Prescribed burns and thinning



## Protect locations



Locate development and timber harvest in areas with high risk of losing public benefits anyway

ENRTF ID: 026-A





**Project Manager Qualifications:** Laura Dee, Postdoctoral Associate, Department of Forest Resources & Institute on the Environment, University of Minnesota

**EDUCATION**

**University of California, Santa Barbara**

**PhD, Bren School of Environmental Science & Management** 2010- 2015

**MA, Department of Economics** 2015

**Brown University**

December 2008

**BS, Marine Biology**

Dr. Laura Dee’s research focuses on the conservation, valuation, and management of natural resources and ecosystem services that contribute to human well-being. Laura’s training is at the interface of ecology, economics, and natural resource management, and she holds an MA and Ph.D. in these areas. She is particularly interested in how future changes in climate and development will impact ecosystem services. To address this question, her research uses statistical analyses of large datasets, bioeconomic modeling, and economic valuation. She applies these approaches to value benefits that ecosystems provide people, and address how they will change under scenarios of environmental change, land-use change, and alternate management.

Laura is currently a post-doctoral associate at the University of Minnesota, affiliated with the Department of Forest Resources and the Institute on the Environment. At the Institute on the Environment, Laura works with the Natural Capital Project, a leader in valuing ecosystem services and in assessing how land-use management affects these benefits. In these roles, Laura is developing and applying approaches to value ecosystem services, including carbon storage, recreation, cultural identity, timber, and water quality. With these approaches, she aims to assess how values will change in the future and determine how to best manage forest resources to ensure that these benefits continue to be provided to current and future generations.

Laura has extensive project management experience, also from previous work experience. At the University of California, Santa Barbara, Laura was a project manager for the Sustainable Fisheries Group. In this role, she managed several projects (including advising and supervising students and research assistants), worked regularly with managers, and managed large databases.

**Organization Description:**

The University of Minnesota is the state’s primary research university and a land-grant university with a strong commitment to public service and education. At UMN, Laura is affiliated with the Department of Forest Resources and the Institute on the Environment. Both departments aim to solve pressing environmental challenges through impactful research, local to global partnerships, and training of the next generation of leaders.