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

Project Title: **ENRTF ID: 060-AH**

Assessing Vegetation Impacts from Deer

Category: H. Proposals seeking $200,000 or less in funding

Sub-Category: A. Foundational Natural Resource Data and Information

Total Project Budget: $ 186,460

Proposed Project Time Period for the Funding Requested: June 30, 2022 (2 yrs)

Summary:

This project will use a citizen science program to determine the economic and ecological impacts of white-tailed deer populations on the health and productivity of Minnesota's forests.

Name: Matthew Russell

Sponsoring Organization: U of MN

Job Title:

Department: Extension

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Location:

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

In 2018, 28 volunteers measured over 250 tree seedlings across eight MN counties in the Assessing Vegetation Impacts from Deer project.

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

PROJECT TITLE: Assessing Vegetation Impacts from Deer

I. PROJECT STATEMENT

This project will use a citizen science program to determine the economic and ecological impacts of white-tailed deer populations on the health and productivity of Minnesota's forests. **This project is needed** to provide natural resource managers and researchers with better information to understand the impacts of deer on Minnesota's forest vegetation to support strategic forestry and wildlife management goals.

Half a million Minnesotans hunt deer every year which generates nearly $500 million in annual economic activity. Within the state's deer herd, problems with abundant populations include an increase in deer diseases such as chronic wasting disease, Lyme disease in humans, deer-motor vehicle collisions, crop depredation, and damage to residential landscaping. Deer impact forest health by reducing the diversity and abundance of plant species, including commercially important tree species such as pine, maple, and oak through preferential browsing, or can influence forests indirectly by altering habitat availability for wildlife and other forest-dependent organisms. The Nature Conservancy estimates **two out of every three dollars** used on forest restoration work in northeastern Minnesota is spent on protection from deer browsing.

The Minnesota Department of Natural Resources' (DNR) Deer Management Plan (2018) highlights the need for better metrics to understand the vegetation impacts from deer. This project directly addresses half of the Plan's goals: public involvement, monitoring and research, maintaining natural wildlife habitat, and reducing negative impacts of deer. Since 2018 the University of Minnesota Extension has engaged citizen scientists in the Assessing Vegetation Impacts from Deer program (AVID; avid.umn.edu). The program trains volunteers to monitor the impacts of deer browse on tree seedlings across Minnesota's forests. The **overall goal** of this project is to engage Minnesota's conservationists in vegetation monitoring and share the collected data with researchers to understand the vegetation impacts from deer. Specific objectives are to (1) train citizen scientists in vegetation monitoring protocols through the AVID program using web-based and in-person trainings, (2) use the compiled data as a metric to better understand the relationships between deer management and vegetation, and (3) conduct economic and ecological scenario analyses that forecast future forests with contrasting deer browse levels. Data collected through the AVID program are unique compared to those collected by state and federal agencies because (1) measurements occur more frequently (annually for three years) and (2) measurements focus only on palatable tree species that are preferred by deer. The **outcomes of this project** include understanding the influence of deer on tree growth and survival across Minnesota's forests and an assessment of the interactions between deer management and forest health for the state's strong deer hunting and conservation legacy. We will achieve these goals by forming a team of citizen scientists, researchers, and professionals to collect and analyze vegetation data to support healthy forests.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1 Title: Engaging Minnesota's conservationists as citizen scientists to monitor vegetation.
Description: We will train citizen scientists using web-based and in-person workshops to be proficient in the AVID methods to monitor vegetation impacts and identify deer browse. The target audience includes conservationists and naturalists (e.g., Master Naturalists, Master Woodland Owners, deer hunters) that use both public- and privately-owned forestlands. The target is a minimum of twelve in-person workshops with the goal of educating and empowering a group of citizen scientists.

ENRTF BUDGET: $106,212

Outcome	Completion Date
1. Four in-person AVID workshops are complete (goal: 1,000 volunteer hours in year one)	*September 2020*
2. Eight in-person AVID workshops are complete (goal: 2,500 volunteer hours in year two)	*September 2021*
3. Statewide deer-vegetation monitoring dataset undergoes quality assurance/validation	*December 2021*

Activity 2 Title: Data sharing and forecasting future forests.
Description: We will use citizen science data compiled from Activity 1 and disseminate it using the Data Repository for the University of Minnesota. This will facilitate information sharing across organizations. We will use the data to create a forest simulation tool that forecasts future forests and is sensitive to deer browse and forest management strategies. We will implement and refine this tool across broad landscape ownerships (e.g., on county and/or non-profit landholdings). We will integrate the citizen science data with deer population estimates determined by the MN DNR and additional forest inventory information collected on tree seedlings and deer browse by the USDA Forest Service-Northern Research Station.

ENRTF BUDGET: $80,248

Outcome	Completion Date
1. Statewide deer-vegetation monitoring dataset is published	*February 2022*
2. Integrated forest-wildlife datasets are analyzed	*April 2022*
3. Forest-deer browse simulation tool is released as an online tool	*May 2022*
4. Research reports are published and outreach of findings is complete	*June 2022*

III. PROJECT PARTNERS AND COLLABORATORS:
The University of Minnesota, including the Department of Forest Resources and Extension, will receive the funding and form the leadership through the project's completion. This project will be led by Dr. Matthew Russell with collaboration from Dr. Mark Nelson (USDA Forest Service, Northern Research Station), Dr. Meredith Cornett (The Nature Conservancy/UMN), and the MN Department of Natural Resources.

IV. LONG-TERM IMPLEMENTATION AND FUNDING:
Given the fundamental importance of deer and their influence on forests (e.g., tree regeneration, presence of invasive plants), we expect that natural resource professionals and researchers in forestry and wildlife decision-making processes will utilize this information and associated results. Working across multiple state and federal agencies, this project will combine diverse information sources to make them available to both technical and nontechnical audiences. This effort will form the foundation for the continued development and refinement of future research to support strategic natural resource management planning. Such information is vital in Minnesota to effectively monitor and evaluate the ecological and economic impacts to forest health while maintaining healthy deer populations across the state.

V. SEE ADDITIONAL PROPOSAL COMPONENTS:

A. Proposal Budget Spreadsheet
B. Visual Component or Map
F. Project Manager Qualifications and Organization Description

Attachment A: Project Budget Spreadsheet
Environment and Natural Resources Trust Fund
M.L. 2020 Budget Spreadsheet
Legal Citation:
Project Manager: Matthew Russell
Project Title: Assessing Vegetation Impacts from Deer
Organization: Regents of the University of Minnesota
Project Budget: $186,460
Project Length and Completion Date: 2 years, Completed 6/30/22
Today's Date: April 12, 2019

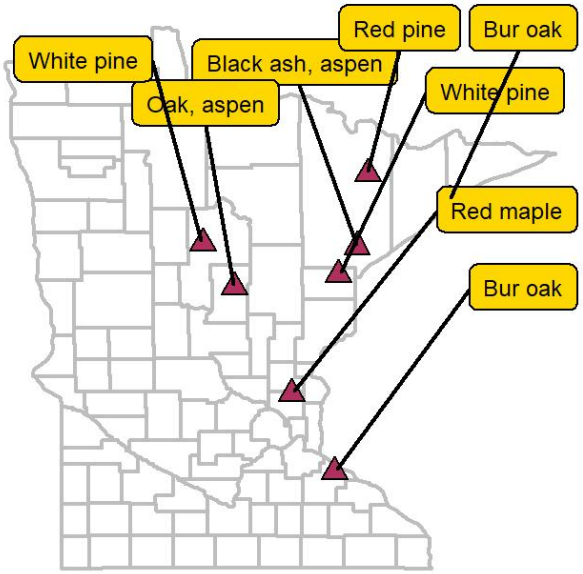
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance
BUDGET ITEM			
Personnel (Wages and Benefits)	$ 178,370	$ -	$ 178,370
Matthew Russell, PI, University of Minnesota Dept. of Forest Resources and Extension. 4% FTE for two years for project administration, instruction, and research activities. Includes salary plus 36% fringe. $14,412			$ -
Program Coordinator, University of Minnesota Extension. 100% FTE for two years for development, evaluation, and reporting of citizen science program impacts. Includes salary plus 29.5% fringe. $91,783			$ -
Researcher 4, University of Minnesota Dept. of Forest Resources. 100% FTE for one year for data management, report writing. Includes salary plus 29.5% fringe. $65,559			$ -
Emily Dombeck, Univeristy of Minnesota Extension. 5% FTE for two years for project communications and development of promotional materials. Includes salary plus 29.5% fringe. $6,616			$ -
Professional/Technical/Service Contracts			
	$ -	$ -	$ -
Equipment/Tools/Supplies			
Citizen scientist kits for vegetation monitoring. 50 kits in each year at x $52 each. Include seedling tags, PVS pipe, folding rulers, bags, and seedling monitoring sticks.	$ 5,200		$ 5,200
	$ -	$ -	$ -
Capital Expenditures Over $5,000			
	$ -	$ -	$ -
Fee Title Acquisition			
	$ -	$ -	$ -
Easement Acquisition			
	$ -	$ -	$ -
Professional Services for Acquisition			
	$ -	$ -	$ -
Printing			
Printing of workshop promotional materials	$ 1,500		$ 1,500
	$ -	$ -	$ -
Travel expenses in Minnesota			
Fleet Rental of Minivan - 6 workshops each year x $56/day	$ 672		$ 672
Mileage to Workshops - 6 workshops each year x 160 miles x $.23	$ 442		$ 442
M&IE for Extended Day - 6 workshops each year x $23 (dinner only)	$ 276	$ -	$ 276
Other			
	$ -	$ -	$ -
COLUMN TOTAL	$ 186,460	$ -	$ 186,460

SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT	Status (secured or pending)	Budget	Spent	Balance
Non-State:		$ -	$ -	$ -
State:		$ -	$ -	$ -
In kind: University's Indirect Costs $186,460 x 54%		$ 100,688	$ -	$ 100,688

Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS	Amount legally obligated but not yet spent	Budget	Spent	Balance
		$ -	$ -	$ -

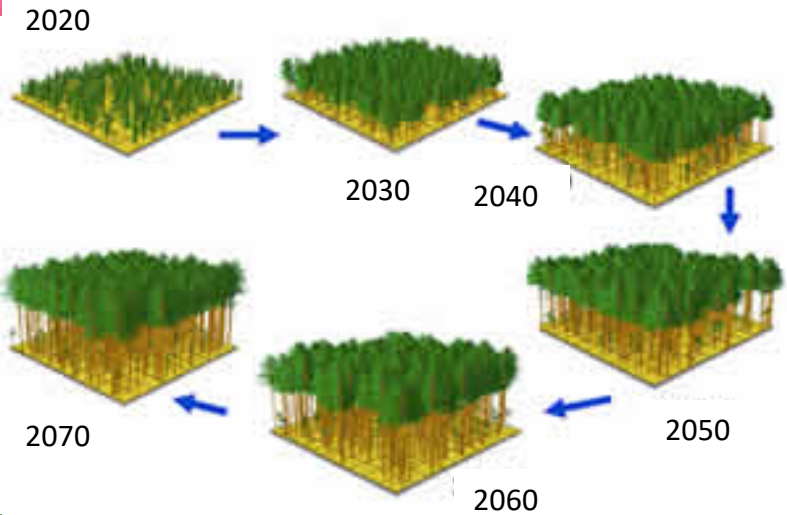
Assessing Vegetation Impacts from Deer

A browsed pine seedling.



2018 pilot data: 28 volunteers measured 250+ tree seedlings across eight MN counties.

Learning how to identify deer browse.



Data will provide information for forecasting future forests.

PROJECT MANAGER QUALIFICATIONS AND ORGANIZATION DESCRIPTION

Project Manager: Matthew B. Russell

Affiliation: Department of Forest Resources and Extension
University of Minnesota

Title: Associate Professor/Extension Specialist

Contact: 1530 Cleveland Ave. N
St. Paul, MN 55108
612-626-4280 (ph)
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Qualifications: Matthew Russell has a Ph.D. in forest resources from the University of Maine, an M.S. in forestry from Virginia Tech, and a B.S. in forestry from Paul Smith's College. He specializes in forest ecosystem health and is the team lead for the Forest Ecosystem Health program in the University of Minnesota's Extension Center for Agriculture, Food and Natural Resources. His research and Extension interests focus on managing natural resources in the face of environmental changes. From 2008-2012, he was Forest Data Manager for the US Forest Service Penobscot Experimental Forest, a long-term experiment focused on evaluating the ecological and environmental impacts of varying forest management techniques. From 2008-2009 he was Forest Data Manager for the Cooperative Forestry Research Unit, a forest industry-university research cooperative established at the University of Maine. He has led the Assessing Vegetation Impacts from Deer citizen science program in UMN Extension since 2017 (avid.umn.edu)

Organizations: The University of Minnesota Extension integrates research and education in a way that is unique to Extension's role in the land-grant university system, bringing University science-based solutions into Extension education to strengthen Minnesota. Extension fulfills its mission to make a difference in every county, by connecting community needs with the University resources that address critical issues in Minnesota. A number of citizen science programs exist through Extension: https://extension.umn.edu/natural-resources#citizenscience. Through its Driven to Discover initiative, the University of Minnesota Extension has established a model citizen science program that is applied across its programs.

The mission of the Department of Forest Resources located at the University of Minnesota is to advance the science and management of forests and related natural resources, develop future leaders in forest and natural resource management through undergraduate and graduate education, and to serve citizens through outreach.