



Environment and Natural Resources Trust Fund

2027 Request for Proposal

General Information

Proposal ID: 2027-306

Proposal Title: Balancing Wildlife Habitat, Forest Management, and Climate Readiness

Project Manager Information

Name: John Zobel

Organization: U of MN - College of Food, Agricultural and Natural Resource Sciences

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Project Basic Information

Project Summary: Minnesota recently invested significantly in estimating carbon and climate impacts of future forest management. This project leverages that work to consider future wildlife habitat and the interaction with climate-smart forestry.

ENRTF Funds Requested: \$163,000

Proposed Project Completion: June 30, 2030

LCCMR Funding Category: Small Projects (G)

Secondary Category: Resiliency (A)

Project Location

What is the best scale for describing where your work will take place?

Statewide

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.

The Minnesota Forest Resources Council funded a large-scale project that sought to understand the effect of different forest management paradigms on carbon within the forest and harvested wood products. Projected management scenarios included no management (leaving the forests alone), business as usual, climate adaptive (building resilience to a changing climate), and economic intensive (maximizing sustainable return). The effect on the carbon cycle varied, but overall Minnesota forests accumulated carbon under each scenario, albeit at different rates. The business as usual and economic intensive approaches showed sustainable flow of wood products and climate adapted showed the largest long-term carbon storage. The no management approach highlighted the likely result that harvests would occur elsewhere while significantly increasing risk of loss from disturbance.

The results from the study will directly influence climate strategy for the state of Minnesota. However, climate is only one consideration of forest management. The implications of the management alternatives on wildlife habitat remains unclear. In order to balance forest, climate, and wildlife objectives, there remains a critical gap in describing the effect of future forest management on native habitat. In particular, policy or practice that elevates climate focused management may have unintended consequences for native wildlife species in Minnesota.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

The Minnesota Forest Resources Council carbon project represents a significant financial and time investment to project carbon implications of future forest management alternatives. We propose to leverage this substantial body of work to estimate the effects on wildlife habitat across the state. The data and model outputs are readily transferable, and these will form inputs into the Wildlife Habitat Indicator for Native Genera and Species (WHINGS) model. This habitat model originates from the Generic Environmental Impact Statement for Minnesota in the 1990s. Developed by over 25 wildlife professionals and further refined and updated over the decades, this model uses forest inventory information to evaluate habitat quality and quantity for 173 native, forest dependent wildlife species. Results illustrate both gains and losses in habitat and the tradeoffs between species (some benefit while others decline). The WHINGS model has been used to evaluate the effect of the Department of Natural Resources Sustainable Timber Harvests Plan, as well as over 40 years of past forest dynamics in the state. We propose to use it to evaluate the habitat implications of diverse future forest management to ensure wildlife habitat considerations may also be included when balancing forest actions for multiple objectives and climate mitigation.

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?

The final report and related outreach will provide a quantitative basis for including wildlife habitat considerations during climate policy discussions at the state level. Results will enhance balancing forest management and planning for multiple objectives, leading to better conservation of state natural resources while facilitating diverse goals. Further, projections of future wildlife habitat will inform current forest planning efforts and management decisions to ensure sustainability of habitats into the future and provide full disclosure of tradeoffs for different wildlife species, including threatened, endangered, and special concern species.

Activities and Milestones

Activity 1: Compile observed and projected forest inventory information and prepare for habitat analysis

Activity Budget: \$70,080

Activity Description:

The Minnesota Forest Resources Council (MFRC) funded substantial modeling efforts to project Minnesota forest inventory information 100 years into the future under four management scenarios: 1) No management, 2) business as usual, 3) climate adapted, and 4) economic intensive. These scenarios were run for eight important forest types in Minnesota: aspen/birch, oak, northern hardwood, red pine, upland spruce/fir, lowland conifer, black ash, and other. Additional projections were also completed that included prescribed fire, increased mortality due to emerald ash borer, and scenarios that increased levels of harvest within sustainable levels. The modeling used the most recent U.S. Forest Service, Forest Inventory and Analysis (FIA) data across the state, along with the Forest Service developed Forest Vegetation Simulator (FVS), the only nationally approved forest growth model for carbon market analysis. All simulations at the tree and stand level were retained, and a graduate student will compile all this information, then organize and clean these data for use in the wildlife habitat analysis. The data is open access, but permission has also been obtained from MFRC staff and collaborators (multiple investigators are also collaborating on this proposal). These data represent significant non-ENRTF time and funding contributions to this proposal.

Activity Milestones:

| Description | Approximate Completion Date |
|--|-----------------------------|
| Recruit and hire graduate student | August 31, 2027 |
| Compile all completed forest inventory and projection data | June 30, 2028 |
| Clean and prepare data for wildlife habitat analysis | June 30, 2028 |

Activity 2: Review, update, and run the wildlife habitat model to estimate and compare alternative future habitat conditions

Activity Budget: \$71,596

Activity Description:

The Wildlife Habitat Indicator for Native Genera and Species (WHINGS) model was developed and periodically reviewed and updated by wildlife professionals across the last three decades. To ensure the model provides the most accurate and up-to-date estimates, we will review the methodology and submodels to improve resolution and precision where applicable. An advisory team comprising leading wildlife, forestry, and tribal stakeholders will assist a graduate student with the review and updates. Subsequently, the model will run for each forest management scenario to assess the wildlife habitat implications across the different management paradigms and future alternatives. Results will compare business as usual operations with more, less, and climate focused management to assess future forest policy and planning alternatives on wildlife habitat. The results for habitat will also be compared with the previous findings for carbon to understand the effects of climate-smart management options on wildlife habitat, assisting policy and planning for multi-use objectives within natural resource management. All 173 native, forest-dependent wildlife species will be included in the evaluation, with implications and tradeoffs for individual species and species groups highlighted, including those for threatened, endangered, and special concern species.

Activity Milestones:

| Description | Approximate Completion Date |
|-------------|-----------------------------|
|-------------|-----------------------------|

| | |
|---|-------------------|
| Review and update WHINGS methodology and submodels, where applicable | December 31, 2028 |
| Run the WHINGS model for all forest simulations and management alternatives | June 30, 2029 |
| Compare results through assessment of statistically significant changes between management alternatives | June 30, 2029 |
| Compare carbon and habitat results to identify tradeoffs between climate-focused and wildlife-focused forest management | June 30, 2029 |

Activity 3: Disseminate results through publications, webinar(s), and presentations to inform policymakers and natural resource stakeholders in Minnesota

Activity Budget: \$21,324

Activity Description:

In order to inform relevant stakeholders within Minnesota, a comprehensive published report will document the methods, results, and comparisons that describe the effect of future forest management alternatives, including climate-focused management, on wildlife habitat within the state. The Minnesota Forest Resources Council advises the governor on forest policy and is actively participating in developing Minnesota climate policy. This report will inform these efforts to better understand and implement balanced forest management for multiple objectives. In addition, results will be shared through Sustainable Forests Education Cooperative (SFEC) webinar(s) and multiple presentations across the state to inform stakeholders and natural resource practitioners on wildlife habitat considerations during forest planning, including the interaction with climate goals. We will also publish one or more peer-reviewed publications to inform local, national, and international audiences on implications and realities of balancing multi-use objectives within forest and natural resource management. Additional opportunities will likely arise and provide venues for informing state, federal, and private stakeholder efforts to sustainably manage wildlife habitat in Minnesota.

Activity Milestones:

| Description | Approximate Completion Date |
|--|-----------------------------|
| Publish a comprehensive final report detailing implications of future forest management alternatives on wildlife habitat | December 31, 2029 |
| Conduct webinar(s) through the Sustainable Forests Education Cooperative and present findings at local meetings | June 30, 2030 |
| Publish peer-reviewed publication(s) detailing results to local and broader audiences | June 30, 2030 |

Project Partners and Collaborators

| Name | Organization | Role | Receiving Funds |
|------------------|--|---|-----------------|
| Matthew Russell | Arbor Analytics | Co-Principle Investigator | No |
| David Wilson | Minnesota Forest Resources Council | Co-Principle Investigator | No |
| Lindsey Shartell | Minnesota Department of Natural Resources, Regional Wildlife Manager | Advisory Committee | No |
| Alexis Grinde | Natural Resources Research Institute, Avian Ecology Lab | Advisory Committee | No |
| Michael Joyce | Natural Resources Research Institute, Wildlife Ecology Lab | Advisory Committee | No |
| Alex Mehne | Fond du Lac Resource Management | Advisory Committee | No |
| Tyler Gifford | University of Tennessee | Advisory Committee, Co-Principle Investigator (Dr. Gifford recently became a faculty member after working several years at the University of Minnesota. He was integral to the projects influencing this proposal, so his contributions are needed, although no funds will move outside of MN). | No |

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.

In order to inform relevant stakeholders within Minnesota, a comprehensive published report will document the methods, results, and comparisons that describe the effect of future forest management alternatives, including climate-focused management, on wildlife habitat within the state. The Minnesota Forest Resources Council advises the governor on forest policy and is actively participating in developing Minnesota climate policy. This report will inform these efforts to better understand and implement balanced forest management for multiple objectives. In addition, results will be shared through Sustainable Forests Education Cooperative (SFEC) webinar(s) and multiple presentations across the state to inform stakeholders and natural resource practitioners on wildlife habitat considerations during forest planning, including the interaction with climate goals. We will also publish one or more peer-reviewed publications to inform local, national, and international audiences on implications and realities of balancing multi-use objectives within forest and natural resource management. Additional ad-hoc opportunities will provide venues for informing state, federal, and private stakeholder efforts to sustainably manage wildlife habitat in Minnesota.

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 work be funded?

The results will be readily available to policymakers, natural resource practitioners and planners, and interest groups through a final report, presentations, and journal article(s), thus influencing future policy management decisions. These outputs will continue to help guide future conservation efforts and enable balancing of multiple use objectives of these resources. The data used in all projections will remain publicly available through the Minnesota Forest Resources Council, and WHINGS model results will remain publicly available through the University of Minnesota. Any improvements or modifications to the WHINGS model will be implemented in subsequent modeling efforts through internal funding.

Other ENRTF Appropriations Awarded in the Last Six Years

| Name | Appropriation | Amount Awarded |
|--|---|----------------|
| Removing Barriers to Carbon Market Entry | M.L. 2023, , Chp. 60, Art. 2, Sec. 2, Subd. 03b | \$482,000 |

Project Manager and Organization Qualifications

Project Manager Name: John Zobel

Job Title: Associate Professor

Provide description of the project manager's qualifications to manage the proposed project.

Dr. John Zobel works in the area of forest/natural resources biometrics, measurements, and modeling, including inventory, wildlife habitat, and resource assessment. His research includes assessment of forest dependent wildlife habitat, removing inventory barriers to carbon market entry, estimation of carbon effects from forest management, general growth and yield modeling, and statistical support for projects involving black bear behavior, bat population trends due to white-nose syndrome, and recovery of forest after emerald ash borer. He has expertise in evaluating and projecting wildlife habitat change due to realized or proposed forest management. Zobel has led or been part of teams that had proposals funded for nearly \$24,000,000 while advising seven graduate students, supervising three post-doctoral associates, and authoring or co-authoring 40 peer-reviewed publications.

Organization: U of MN - College of Food, Agricultural and Natural Resource Sciences

Organization Description:

For over 100 years, the Department of Forest Resources, University of Minnesota has been a leader in fundamental and applied research in natural resources within Minnesota, the Lake States, nationally, and internationally.

Budget Summary

| Category / Name | Subcategory or Type | Description | Purpose | Gen. Ineligible | % Benefits | # FTE | Classified Staff? | \$ Amount |
|---|---|--|---|-----------------|------------|-------|-------------------|------------------|
| Personnel | | | | | | | | |
| Graduate Student | | Data compilation and analysis lead | | | 28.9% | 2 | | \$117,933 |
| J. Zobel/Summer Salary | | Project Lead | | | 36.6% | 0.21 | | \$36,152 |
| | | | | | | | Sub Total | \$154,085 |
| Contracts and Services | | | | | | | | |
| Sustainable Forests Education Cooperative | Internal services or fees (uncommon) | Facilitate workshops/webinars for introducing and instructing stakeholders on the results and implications of future forest management and climate smart alternatives on wildlife habitat. | | | | 0.01 | | \$1,000 |
| | | | | | | | Sub Total | \$1,000 |
| Equipment, Tools, and Supplies | | | | | | | | |
| | | | | | | | Sub Total | - |
| Capital Equipment | | | | | | | | |
| | | | | | | | Sub Total | - |
| Acquisitions and Stewardship | | | | | | | | |
| | | | | | | | Sub Total | - |
| Travel In Minnesota | | | | | | | | |
| | Conference Registration Miles/ Meals/ Lodging | Funding for travel to and present at the Minnesota Society of American Foresters and/or the Minnesota Wildlife Society winter conference for two people (\$1,500 per person) and travel to the Sustainable Forests Education Cooperative Research Review | Disseminate project results and inform/educate forest and wildlife practitioners through presenting and discussing project results. | | | | | \$4,500 |

| | | | | | | | | |
|---------------------------------|-------------|--|--|--|--|--|--------------------|------------------|
| | | conference at the Cloquet Forestry Center for two people (\$500 per person) and miscellaneous meetings of the in-state advisory committee (\$500). | | | | | | |
| | | | | | | | Sub Total | \$4,500 |
| Travel Outside Minnesota | | | | | | | | |
| | | | | | | | Sub Total | - |
| Printing and Publication | | | | | | | | |
| | Publication | Open access publication charges | Allows the project deliverables to reach a larger audience without the barrier of subscription fees. | | | | | \$3,415 |
| | | | | | | | Sub Total | \$3,415 |
| Other Expenses | | | | | | | | |
| | | | | | | | Sub Total | - |
| | | | | | | | Grand Total | \$163,000 |

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 | | | | |
| Cash | Minnesota Forest Resources Council, Estimating current and future carbon stocks and emissions in Minnesota forests and forest products under multiple management scenario, Grant #224868 | The grant lasted from April 5, 20203 - June 30, 2025. The Minnesota forest inventory projections will form the basis of the wildlife habitat analysis. The synthesis work will enable proposed evaluation of the effect different forest management futures and climate practices will effect wildlife habitat in the state. Only the project funds directly applicable to this proposal were included. | Secured | \$298,043 |
| Cash | Minnesota Forest Resources Council, Minnesota Forest Carbon Report Communications, Outreach, & Technical Efforts, Grant #264900 | The grant lasted from March 10, 2025 - June 30, 2025. This provided additional funding to the larger project #224868. The additional Minnesota forest inventory projections will form the basis of further wildlife habitat analysis. Only the project funds directly applicable to this proposal were included. | Secured | \$5,250 |
| In-Kind | Unrecovered Indirect Costs UMN (37% overhead) | Operating costs of the UMN | Secured | \$60,310 |
| | | | State Sub Total | \$363,603 |
| Non-State | | | | |
| | | | Non State Sub Total | - |
| | | | Funds Total | \$363,603 |

Total Project Cost: \$526,603

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [cb36340f-0a6.pdf](#)

Alternate Text for Visual Component

In addition to text, pictures include mature red pine trees, medium sized red pine trees, deciduous tree canopy with blue sky, harvested and stacked aspen logs, golden-winged warbler, pine marten, white-tailed deer, and timber rattlesnake. These relate to graphics showing estimates of diverse future forest carbon with unknown habitat impacts....

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

| Title | File |
|--|----------------------------------|
| UMN Board of Regents Approval to Submit | 10dc65a8-1aa.pdf |
| Carbon Fact Sheet (Minnesota Forest Resources Council) | aef72b83-d48.pdf |

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I understand the UMN Policy on travel applies.

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

No

Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing \$10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care,

treatment, education, training, instruction, or recreation to children")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Amber Kevelin, College of Food, Agricultural, and Natural Resource Sciences, University of Minnesota

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

N/A