Environment and Natural Resources Trust Fund
2010 Request for Proposals (RFP)

LCCMR ID: 223-G

Project Title:

Demonstrating Carbon Sequestration in Minnesota Forests

LCCMR 2010 Funding Priority:

G. Creative Ideas

Total Project Budget: $ $400,832

Proposed Project Time Period for the Funding Requested: 2 years, 2010 - 2012

Other Non-State Funds: $ $8,000

Summary:

Can forest carbon sequestration reduce greenhouse gases? Minnesota Terrestrial Carbon Sequestration Initiative and partners will devise, demonstrate, and disseminate tools and information about multiple benefit approaches to sequestering carbon.

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Sponsoring Organization: Izaak Walton League Minnesota Division

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Location:

Region: Statewide

County Name: Statewide

City / Township:

_____ Knowledge Base _____ Broad App. _____ Innovation

_____ Leverage _____ Outcomes

_____ Partnerships _____ Urgency _____ TOTAL

2009 LCCMR Proposal

Project Title: Demonstrating Carbon Sequestration in Minnesota Forests

I. Project Statement

Minnesota forests currently provide significant greenhouse gas benefits, equivalent to roughly 6 billion tons of CO_2 per year. Scientific evidence suggests that land use and management changes could increase forest carbon to help meet state GHG reduction goals. On-ground demonstrations of key sequestration techniques are needed, however, before widespread forest management changes are promoted. In this proposal, the Minnesota Terrestrial Carbon Sequestration Initiative ('the Initiative") will act on previous recommendations to the legislature to develop and disseminate practical information on forest management practices that could increase carbon values on thousands (and potentially millions) of acres of forestland around the state.

This project undertakes three tasks. First, it will devise a set of scientifically credible and practical decision-making tools to evaluate carbon and related benefits of forestry practices. Second, it will apply these tools on existing projects being undertaken for a variety of conservation and renewable energy purposes. Third, it will translate technical methods and results into educational materials and presentations to help inform public dialogue and decision-making about carbon sequestration projects and policies.

The focus of this proposal is on assessing the value that carbon sequestration may add to existing water quality, forest biodiversity, and community biomass energy programs. Minnehaha Creek Watershed District will examine links between water quality and carbon benefits of forested buffers in urbanizing areas. The Nature Conservancy and Minnesota DNR will assess carbon impacts of innovative ecological restoration practices in the Manitou region; this project addresses numerous priorities in the state's Wildlife Conservation Strategy. And a broad group of university and non-profit groups will collaborate with the City of Grand Marais and with Saint John's Abbey and University to assess carbon and related effects of community-scale bioenergy systems. The analytical tools and methods developed in these collaborations will be disseminated through a user-friendly guidebook, fact sheets, and public presentations.

II. Description of Project Results

Result 1: Decision-making tools for evaluating the feasibility and results of incorporating carbon sequestration into existing programs **Budget: $101,932**

A critical step in implementing credible carbon sequestration programs is improving our ability to assess carbon results of key practices. We will design or adapt a linked set of models, sampling protocols, analytical matrices, fact sheets, and guidebook needed to assess forest carbon. Minnehaha Creek Watershed District will focus on tools to assess water quality and carbon effects of stormwater buffers. For the Manitou project, TNC will develop rigorous sampling methods and Dovetail Partners will use them to adapt carbon accounting protocols. UMN Forestry will adapt statewide models on biomass availability, costs, and carbon impacts for use in evaluating community-scale bionenergy systems.

Deliverables	**Completion Date**
1. Methods for assessing carbon in forested buffers	September 2011
2. Tested methods for forest carbon quanitification	December 2011
3. Models to assess feasibility and impacts of small bioenergy systems	September 2011

Result 2: Assessed carbon impacts of watershed reforestation **Budget: $ 50,025**

Can forested watershed buffers provide GHG reduction benefits, and at what cost? Minnehaha Creek Watershed District will use tools created above to evaluate the costs and benefits of reforesting stormwater buffers and other open space. Applied Ecological Services, a subcontractor, will quantify impacts in MCWD's Painter Creek sub-watershed under "business as usual" versus increased reforestation scenarios.

Deliverables	**Completion Date**
1. Cost & benefits of carbon and water quality per tree and per acre	December 2011
2. Implementation recommendations for watershed comprehensive plan	December 2011

Result 3: Assessed carbon impacts of ecological silvaculture. **Budget: $17,759**

How does restoration of diverse tree species and age classes impact carbon stocks and sequestration? The Manitou Ecological Silvaculture Project will demonstrate the effects of ecological restoration on forest ecosystems. The MN Dept of Natural Resources and The Nature Conservancy will augment existing field

sampling to compare carbon stocks in treatment and control plots at the Manitou site. Dovetail will use sampling data to refine protocols and models and project future carbon sequestration.

Deliverables	**Completion Date**
1. Field sampling results and quantified sequestration projections	December 2011
2. Documented costs of practices and monitoring	December 2011

Result 4: Assessed carbon impacts of community-scale bioenergy systems **Budget: $117,155**

What are the carbon effects of community bioenergy systems? How can communities evaluate current and future bioenergy options and impacts? Dovetail Partners, UMN, and other partners will apply tools to project carbon and other impacts of biomass harvest and use in community-scale co-generation energy systems at Saint John's Abbey and University and the City of Grand Marais. Alternative scenarios of woody biomass availability and costs, procurement issues, carbon and environmental effects will be evaluated. Preliminary engineering needs at Saint John's will be evaluated.

Deliverables	**Completion Date**
1. Scenarios of biomass, carbon, environmental, economics	September 2011
2. Analytical framework for use in evaluating options	December 2011
3. Engineering evaluations of bioenergy plant	December 2011

Result 5: Education and outreach **Budget: $41,980**

Our educational objectives are to make Minnesota-specific decision-making tools available to communities, land managers, and policymakers and, second, to help inform the important public dialogue about the role of carbon sequestration in greenhouse gas reduction. Information obtained from these projects will help Minnesotans make decisions about investments in carbon sequestration projects and help plot strategies that prove out on the ground. The Initiative will coordinate outreach activities and publications on forest carbon sequestration issues and produce a community guidebook on forest management strategies.

Deliverables	**Completion Date**
1. Saint John's conference on forest carbon issues and opportunities	December 2010
2. Presentations and site visits	June 2012
3. Fact sheets and guidebook on carbon management	June 2012

III. Project Strategy

A. Project Team/Partners

Cheryl Miller of Minnesota Terrestrial Carbon Sequestration Initiative is Project Manager, She will also lead outreach and publication projects. *Minnehaha Reforestation:* Mark Ten Eyck of Minnehaha WD will oversee assessments by Applied Ecological Services and coordinate resulting plans. *Manitou Project*: Jim Manolis, MN DNR, is team leader; Mark White of TNC will implement field sampling and carbon analysis. *Community bioenergy:* Katie Fernholz of Dovetail Partners is team leader and will conduct carbon accounting for the bioenergy and Manitou projects. Grant Domke, UMN Forestry) and Steve Taff (Applied Economics) will assess biomass, economic, and carbon impacts of community bioenergy projects. Don Arnosti, a private contractor, will analyze biomass procurement issues and develop a community bioenergy analytical framework. Tom Kroll of Saint John's Abbey and University, and Bob Fenwick, Cook County Commissioner, are community liaisons.

B. Timeline Requirements

The Minnehaha Creek reforestation project run sfrom July 2010 to September 2011. The Manitou Project runs from April to December, 2011. The Community Bioenergy Project is July 2010 to December, 2011.

C. Long-Term Strategy

The carbon assessments and tools developed in this project will be used by partners and other interested entities in acquisition and management decisions. Costs associated with monitoring carbon sequestration at five-year intervals may be absorbed internally by these organizations, particularly if incentives for positive carbon benefits are documented. The Initiative is developing a variety of funding proposals for long-range monitoring and education related to key sequestration practices.

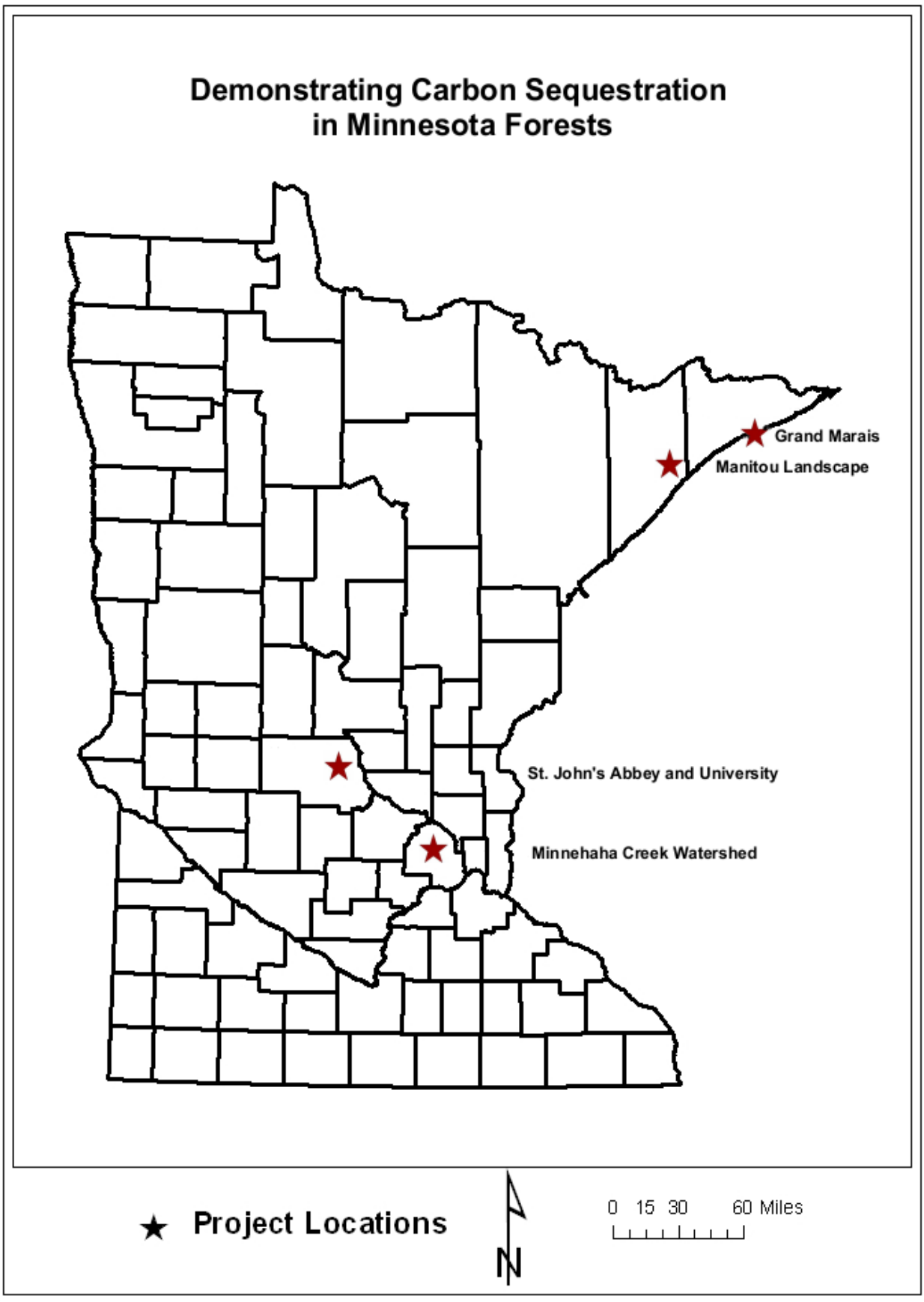
Project Budget

Demonstrating Carbon Sequestration in Minnesota Forests

IV. TOTAL PROJECT REQUEST BUDGET (*All projects run across two year period*)

BUDGET ITEM	AMOUNT
Personnel: Noreen Tyler, Contract Administrator	$ 30,000
Contracts:	
Minnehaha Creek Watershed District: To hire and oversee consultant to develop quantification and monitoring tools for buffers (Result #1); analyze and prioritize sites (#2)	$ 67,450
The Nature Conservancy: To develop rigourous monitoring strategy for ecological restorations (#1); conduct and report post-harvest sampling at Manitou site (#3)	$ 22,000
Dovetail Partners: To adapt carbon accountng models for use at Manitou, Saint John's, Grand Marais (#1); identify ecological effects of biomass scenarios (#4); team leader (#4)	$ 55,000
UMN Forestry: Devise community scale models on biomass availability, economics, and carbon dynamics (#1); conduct scenarios at Saint John's, Grand Marais (#4)	$ 85,000
Saint John's Abbey and University: To hire and oversee engineering consultant for feasibility study of needs, options, costs of converting to biomass energy (#4)	$ 39,500
Don Arnosti: To develop analytical matrix for community biomass system, including biomass supply chain (#4) and develop publication (#5)	$ 13,200
Cheryl Miller: To manage project. To write educational materials and plan and conduct outreach over two year grant period (#5)	$ 65,000
Equipment/Tools/Supplies:	
Forest survey equipment (measuring tapes, compass, clinomenter (#3)	$ 500
Equipment for logging data and GIS (#3)	$ 700
Rental of 4WD for field work $39/day x 70 days, fuel @ $16/day x 65 days (#3)	$ 3,770
Travel: Auto mileage @ $.55/mile. TNC: 12 trips for Manitou field sampling x 180 miles @ $99/trip = $1,188; Dovetail, 6 trips to Duluth (250 mi) plus lodging for 5 nights @ $125; 5 trips to Grand Marais (460 mi), 5 trips to Saint John's (82.5 mi) + 3 overnights @ $125 = $2,928; Don Arnosti, 3 trips to Grand Marais (460), 3 trips to Saint John's (82.5) + 3 overnights (125) = $1,382; Cheryl Miler, 3 trips to Grand Marais (460), 2 trips to Saint John's (82.5), 3 trips to Duluth (250) + 5 overnights (125), 8 presentations (average 200 mi) = $2,861	$ 9,812
Additional Budget Items:	
Design and production of fact sheets and community bioenergy booklet (#5)	$ 8,900
	$ 400,832

SOURCE OF FUNDS	
Other Non-State $ Being Applied to Project During Project Period:	**AMOUNT**
Saint John's will contribute $8,000 to campus bioenergy engineering study (#4)	$ 8,000
In-kind Services During Project Period:	
Minneheha Creek Watershed District wil provide staff time to oversee subcontract, facilitate meetings, and vet buffer methodologies in watershed (#1 and 2)	$ 13,490
DNR will provide staff time and travel expenses to represent state in Manitou project (Result 1 and 3)	$ 5,500
Saint John's will provide staff time to assess bioenergy and forestry issues, and use of conference facilities and services (#4 and 5)	$ 19,000
Funding History: DNR Division of Ecological Resources will provide approximately $35,000 for baseline monitoring at Manitou Project Site.	$ 35,000


Demonstrating Carbon Sequestration
in Minnesota Forests
Grand Marais
Manitou Landscape
St. John's Abbey and University
Minnehaha Creek Watershed
Project Locations
N
0 15 30 60 Miles

Demonstrating Carbon Sequestration in Minnesota Forests
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Project Manager Qualifications

Cheryl Miller, Coordinator of the Minnesota Terrestrial Carbon Sequestration Initiative, will serve as project manager. She will develop and oversee subcontracts with project participants, coordinate common activities of project teams, and manage reporting obligations. For the past four years, Cheryl has facilitated the development and implementation of research projects on scientific, economic, and public policy facets of carbon sequestration. She has successfully solicited and managed grants for research and outreach activities on these topics. In 2008, she organized collaborations with numerous government, non-profit, and business groups to conduct demonstration projects. She served on the Governor's Climate Change Advisory Group and the Midwest Governor's Greenhouse Gas Reduction Accord. She will also lead education and outreach activities included in proposal, including writing fact sheets and a guidebook on forest carbon management. Previous publications include *A User's Guide to Natural Resource Efforts in the Red River Valley* (Minnesota DNR) and *A Citizen's Guide to Wetland Conservation* (Minnesota Audubon). Cheryl has degrees in journalism from the University of Iowa and public policy from the University of California (Davis).

The Minnesota Terrestrial Carbon Sequestration Initiative was created in 2005 to develop and disseminate information about carbon management of Minnesota ecosystems. It provides a forum for academic, government, private, and non-profit audiences to investigate a range of ecological, policy, and management issues about carbon sequestration. In 2008, the Initative and UMN researchers produced two reports for the legislature summarizing state-of-the-science information on carbon sequestration and describing a demonstration and monitoring program to inform policymakers and the public about carbon sequestration and greenhouse gas management. This proposal follows those recommendations. Bill Grant of the Izaak Walton League has served on the Initiative's steering committee since its inception."

Organizational Description

The Izaak Walton League of America's Minnesota Division seeks to conserve, maintain, protect, and restore the soil, forest, water, and other natural resources of the United States and other lands; to promote means and opportunities for the education of the public with respect to such resources and their enjoyment and wholesome utilization.

Founded in 1922, the Izaak Walton League of America is dedicated to common-sense conservation that protects America's hunting, fishing, and outdoor heritage relying on solution-oriented conservation, education, and the promotion of outdoor recreation for the benefit of our citizens. The League has 40,000 members and supporters nationwide.