

## **2005 Project Abstract**

For period Ending June 30, 2008

### **I. PROJECT TITLE: Cedar Creek Natural History Area Interpretive Center and Restoration**

**Project Manager:** David Tilman

**Affiliation:** University of Minnesota

**Mailing Address:** 1987 Upper Buford Circle

**City / State / Zip :** St. Paul, MN 55018

**Telephone Number:** 612-625-5743

**E-mail Address:** tilman@umn.edu

**FAX Number:** 612-624-6777

**Website:** [www.cedarcreek.umn.edu](http://www.cedarcreek.umn.edu)

**Funding Source:** Minnesota Environment and Natural Resources Trust Fund

**Legal Citation:** ML 2005, First Special Session, Chap.1, Art. 2, Sec.11, Subd. 11(b)

**Appropriation Amount:** \$400,000

#### **Overall Project Outcome and Results**

Cedar Creek completed three efforts: 1. restoration of 400 acres of prairie and oak savanna, 2. construction of an energy efficient science interpretive center, and 3. creation of interpretive trails and signage highlighting environmental research, habitats, and wildlife.

*1. Restoration of 400 acres of prairie and oak savanna (\$141,638):* The initial preparation of the restoration project was completed in 2005 and 2006 and burned in 2007 and 2008. Also with the Trust Fund money, Cedar Creek was able to leverage an addition \$60,000 from the National Fish and Wildlife Foundation for the project. The initial preparation work of the 400 acres included: removal of brush and branches on 150 acres, removal of invasive black locust from about 10 acres, and the creation of about 4 miles of new firebreaks. Also the acquisition of 2 fire ATV's outfitted for prescribed burning and the construction of a fire storage shed for prescribed burning vehicles and equipment was completed. Cedar Creek also established 7 vegetative monitoring plots, in which researchers will be using over the next decade to monitor the recovery of the oak savanna.

*2. Construction of a Science and Interpretive Center (\$250,000):* With the Trust Fund money, Cedar Creek was able to acquire an additional \$1.55 million in funds from; Department of Commerce, National Science Foundation, Great River Energy, U of MN Initiative in Renewable Energy and the Environment, and the University, making the total project \$1.8 million. In the spring of 2008, the Raymond L. Lindeman Research and Discovery Center opened, providing a 6000 square foot, highly energy efficient building for Cedar Creek's research and education/outreach programs. Some of the energy efficient features include; decreased volume of the building by lower ceiling height, high energy efficient windows, heat recovery unit, and HVAC units that are 93% efficient. The building includes a 1,500sf science interpretation and education area, two laboratory rooms, and a new computing area for environmental interpretation, research, and education/outreach programs.

3. *Creation of interpretive trails and signage (\$8,362)*: With the Trust Fund money, Cedar Creek purchased 8 interpretive signs to be placed around the 3 mile walking trail that was established. The signage highlights the environmental research, habitats, and wildlife at Cedar Creek. Cedar Creek partnered with the City of East Bethel on this project and the city provided over \$150,000 dollars in material and labor for the construction of the 3 miles of walking trail and over 5 miles of winter ski trails.

#### **Project Results Use and Dissemination**

*Savanna Restoration*: The 400 acre oak savanna/prairie restoration project provided experience for both MCC (Minnesota Conservation Corp) and the DNR. The MCC and DNR helped burn the 400 restoration acres giving their individuals experience and training.

Cedar Creek also is monitoring the vegetation response of the oak savanna restoration unit. Through the collection and analyzing of data we could publish insights into restoration techniques. We will also share our insights through our website.

*Center and Trails*: Both, the new center and trail system have given Cedar Creek the ability to facilitate our newly expanded outreach and education program without interfering with our world class research. In fact, both Cedar Creek's research and outreach programs are complementing each other. In just a few months from opening our doors we have had close to 1000 Minnesotans using the facility for research and outreach through teacher workshops, K-12 school children programs, and general public tour groups.

The new facility is allowing K-12 teachers to hold workshops here, where as before there was no space. In these workshops teachers are learning about Cedar Creek's research directly from the researchers and by seeing the experiments first-hand. Each teacher will bring this information back to the classroom and hopefully through this indirect method, Cedar Creek will impact 1000s of students per year.

Cedar Creek is also bringing K-12 school children out to the site directly for informational and discovery field trips. We are using both the new center and trail to facilitate these trips.

# FINAL REPORT

REC'D SEP 25 2008

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energy efficient windows, heat recovery unit, and HVAC units that are 93% efficient. The building includes a 1,500sf science interpretation and education area, two laboratory rooms, and a new computing area for environmental interpretation, research, and education/outreach programs.

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The new facility is allowing K-12 teachers to hold workshops here, where as before there was no space. In these workshops teachers are learning about Cedar Creek's research directly from the researchers and by seeing the experiments first-hand. Each teacher will bring this information back to the classroom and hopefully through this indirect method, Cedar Creek will impact 1000s of students per year.

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Cedar Creek also is monitoring the vegetation response of the oak savanna restoration unit. Through the collection and analyzing of data we could publish insights into restoration techniques. We will also share our insights through our website.

REC'D SEP 25 2008

## LCCMR 2005 Work Program Final Report

**Date of Report:** Sept.15,2008

**LCCMR 2005 Work Program Final Report**

**Date of Work program Approval:** July 1,2005

**Project Completion Date:** June 30, 2008

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<b>Total Biennial LCMR Project Budget:</b>	<b>LCMR Appropriation:</b>	<b>\$ 400,000</b>
	<b>Minus Amount Spent:</b>	<b>\$ 399,875</b>
	<b>Equal Balance:</b>	<b>\$ 125</b>

**Legal Citation:** ML 2005, First Special Session, Chap.1, Art. 2, Sec.11, Subd. 11(b)

### **Appropriation Language:**

Cedar Creek Natural History Area Interpretive Center and Restoration

\$200,000 the first year and \$200,000 the second year are from the trust fund to the commissioner of natural resources for an agreement with the University of Minnesota, Cedar Creek Natural Area, to restore 400 acres of savanna and prairie; construct a Science Interpretive Center to publicly demonstrate technologies for energy efficiency; and create interpretive trails. This appropriation is available until June 30, 2008, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

### **II. and III. FINAL PROJECT SUMMARY:**

Cedar Creek completed three projects; 1. restoration of 400 acres of prairie and oak savanna, 2. construction of an energy efficient science interpretive center, and 3. creation of interpretive trails and signage highlighting environmental research, habitats, and wildlife.

**1. The restoration of 400 acres of prairie and oak savanna(\$141,638).** The initial preparation of the restoration project was completed in 2005 and 2006 and burned in 2007 and 2008. Also with the Trust Fund money, Cedar Creek was able to leverage an addition \$60,000 from the National Fish and Wildlife Foundation for the project. The initial preparation work of the 400 acres included: removal of brush and branches on 150 acres, removal of invasive black locust from about 10 acres, and the creation of about 4 miles of new firebreaks. Also the acquisition of

2 fire ATV's outfitted for prescribed burning and the construction of a fire storage shed for prescribed burning vehicles and equipment was completed. Cedar Creek also established 7 vegetative monitoring plots, in which researchers will be using over the next decade to monitor the recovery of the oak savanna.

**2. The construction of a Science and Interpretive Center(\$250,000).** With the Trust Fund money, Cedar Creek was able to acquire an additional \$1.55 million in funds from; Department of Commerce, National Science Foundation, Great River Energy, U of MN Initiative in Renewable Energy and the Environment, and the University, making the total project \$1.8 million. In the spring of 2008, the Raymond L. Lindeman Research and Discovery Center opened, providing a 6000 square foot, highly energy efficient building for Cedar Creek's research and education/outreach programs. Some of the energy efficient features include; decreased volume of the building by lower ceiling height, high energy efficient windows, heat recovery unit, and HVAC units that are 93% efficient. The building includes a 1,500sf science interpretation and education area, two laboratory rooms, and a new computing area for environmental interpretation, research, and education/outreach programs.

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#### **IV. OUTLINE OF PROJECT RESULTS:**

##### **Result 1: Restoration of 400 Acres to Savanna-Prairie Habitat**

##### **Description:**

Oak savanna is critical habitat to wildlife such as the red headed woodpecker, and less than 1% of Minnesota's oak savanna remains. Cedar Creek has habitat that once was savanna, but because of the lack of proper equipment, facilities, and initial labor Cedar Creek could not put these acres into it's burn program. With the help of the 2005 Trust Fund (\$141,638) Cedar Creek was able to address these issues and put an additional 400 acres of land into our oak savanna/ prairie burn program. Cedar Creek was also able to use the Trust Fund money to leverage other funds from the National Fish and Wildlife Foundation (\$60,000) and the University to help with our restoration efforts.

As a result of the project, Cedar Creek;

1. Removed brush and branches around trees that we wanted to keep from burning on 150 acres
2. Removed black locust(exotic invasive tree) from about 10 acres
3. Created about 4 miles of new firebreaks by brush removal, mowing and tilling
4. Acquired and outfitted 2 fire ATV's for use in prescribe burning
5. Constructed a fire storage shed for prescribe burning vehicles and equipment
6. Established 7 vegetative monitoring plots, in which we will be using over the next decade to monitor the recovery of oak savanna. With this data we hopefully will receive insight into how to properly restore oak savanna.

With this initial preparation, added equipment, and facilities we were able to burn over 400 acres of land that was overgrown oak savanna and prairie in 2007 and 2008. The first burns were effective in removing most of the small understory bush, but it will take many more burns to kill the unwanted large trees. Our goal is to accomplish this in the upcoming years and now Cedar Creek has the means to accomplish this because of the updated equipment and facilities. Also through the 400 acre oak savanna/prairie restoration project, Cedar Creek was able to provide experience for both MCC (Minnesota Conservation Corp) and the DNR. The MCC and DNR helped burn the 400 restoration acres giving their individuals experience and training. Cedar Creek hopes to continue and possibly expand these relationships with our land management endeavors.

Cedar Creek also is hoping to publish insights into restoration techniques with the vegetation monitoring plots we established. Cedar Creek will continue to collect and analyze this data as we continue to burn these areas. We will also share our insights through our website.

<b>Summary Budget Information for Result 1: LCMR Budget</b>	<b>\$141,638</b>
<b>Balance</b>	<b>\$ 59</b>

## **Result 2: Energy Efficiency: Science Interpretive Center**

### **Description:**

Cedar Creek is a world leader in environmental research, addressing such topics as global warming, decrease biodiversity, and increase CO2. As these topics and others became increasing more important for society, the dissemination of Cedar Creeks' research to the general public became critical. The problem was that Cedar Creek lacked the proper facilities to disseminate our research to the general public.

In 2005, this problem was addressed with a \$250,000 grant from LCCMR to increase our facilities. With the LCCMR grant, Cedar Creek leveraged it and acquired an additional \$1.55 million in funds from; Department of Commerce, National Science Foundation, Great River Energy, U of MN Initiative in Renewable Energy and the Environment, and other University sources. With the total project cost being \$1.8 million, Cedar Creek was able to build the much needed Raymond L. Lindeman Research and Discovery Center.

In the spring of 2008, the Raymond L. Lindeman Research and Discovery Center opened, providing a 6000 square foot, highly energy efficient building for our research and education programs. Some of the energy efficient features include; decrease volume of the building by lower ceiling height, high energy efficient windows, heat recovery unit, and HVAC units that are 93% efficient. The building includes a 1,500sf science interpretation and education area, two laboratory rooms, and a new computing area equipped with state-of-the-art hardware and software, and upgraded T1 wireless networking capacity for the environmental interpretation, education and outreach programs.

In just a few months from opening our doors we have had close to 1000 Minnesotans using the facility for research and outreach through teacher workshops, K-12 school children programs, and general public tour groups. The new facility is allowing K-12 teachers to hold workshops here, where as before there was no space. In these workshops teachers are learning about Cedar Creek's research directly from the researchers and by seeing the experiments first-hand. Each

teacher will bring this information back to the classroom and hopefully through this indirect method, Cedar Creek will impact 1000s of students per year. Cedar Creek is also bringing K-12 school children out to the site directly for informational and discovery field trips. We are using both the new center and trail to facilitate these trips.

<b>Summary Budget Information for Result 2:</b>	<b>LCMR Budget</b>	<b>\$250,000</b>
	<b>Balance</b>	<b>\$0</b>

**Completion Date:** June 15, 2008

### **Result 3: Interpretive Trails**

#### **Description:**

Along with Cedar Creek's expanded facilities to accommodate our new education and outreach programs, Cedar Creek thought an interpretive public trail system would provide direct experience and information to the public about our research and habitats. Cedar Creek did not have the ability or finances to construct a trail system so we partnered with the local City of East Bethel and The Trust Fund.

The Trust Fund provided \$8,632 for 8 interpretive signs to be placed around the 3 mile long walking trail. These interpretive signs will explain the different habitats the trail goes through and how Cedar Creek's research is looking into the different aspects of these habitats. The walking trail goes through savanna, prairie, and wetlands providing a unique experience for the public. The trail consists of three miles of walking trails, containing two observational platforms on the Fish Lake and a floating bridge over the wetlands connecting the trail. Also during the winter we have over five miles of cross-country ski trails in trail area.

As part of the project we leveraged the Trust Fund money and the City of East Bethel provided over \$150,000 in labor and materials to construct the 3 mile walking interpretive trail and the 5 mile cross-country ski trail.

<b>Summary Budget Information for Result 3:</b>	<b>LCMR Budget</b>	<b>\$8,362</b>
	<b>Balance</b>	<b>\$ 66</b>

### **V. TOTAL LCMR PROJECT BUDGET: \$400,000**

	<b>All Results: Personnel: \$86,000</b>
	<b>All Results: Equipment \$41,000</b>
<b>Amended</b>	<b>All Results: Equipment: \$35,638</b>
	<b>All Results: Development: \$273,000</b>
<b>Amended</b>	<b>All Results: Development: \$278,362</b>
	<b>All Results: Acquisition: \$0</b>
	<b>All Results: Other: \$0</b>

**TOTAL LCMR PROJECT BUDGET: \$400,000**

**Explanation of Capital Expenditures Greater Than \$3,500:**



The interpretive center will be used throughout its life for its original purpose of public outreach, which is an integral part of the ongoing mission of Cedar Creek. The fire ATVs will be outfitted for controlling prescribed burns and will be used throughout their lives for that purpose, as will the storage shed to house and maintain fire equipment, including the ATVs.

**A. Other Funds Spent during the Project Period:**

**Interpretive Center:** The University of Minnesota's Initiative on Renewable Energy and The Environment provided \$100,000, Great River Energy provided a grant of \$50,000, Science Foundation provided a grant of \$280,000, and the College of Biological Science and other University sources provided an additional \$1,134,000 for the construction of the building. Connexus also provided an in-kind grant of \$25,000 towards electrical cost of the building. The Minnesota Department of Commerce contributed \$20,000 and an additional \$5,000 for displays and other materials providing educational information on energy efficiency.

**Trail:** East Bethel contributed an estimated \$150,000 to the trail project in labor and material costs over the grant period.

**Restoration:** Cedar Creek obtained a National Fish and Wildlife Foundation grant of \$60,000 to help out with the restoration efforts.

**B. Required Match:**

**Interpretive Center:** The University of Minnesota, College of Biological Sciences provided \$300,000 as matching funds toward the design and construction of the Science Interpretive Center.

**Restoration:** Cedar Creek provided an in-kind match of \$40,000 for labor and supervision for the savanna and prairie restoration project ( T. Mielke, J. Krueger, and J. Corney). Cedar Creek also provided over \$34,400 in-kind match for research on savanna restoration (Tilman, J. Corney, and J. Haarstad).

**C. Prior Spending:** Cedar Creek had spent approximately \$25,000 in 2003 and 2004 updating fire equipment and approximately \$10,000 for conceptual design of the Science Interpretive Center and related facilities of the master plan.

**VII. Project Partners:** \$35,000. Minnesota Conservation Corps (MCC), performed equipment-intensive tasks to prepare habitats for burning and to construct firebreaks, and assisted with burns. MCC also removed the 10 acres of black locust by cutting and came out throughout 2005-2008 to spot spray.

**VIII. DISSEMINATION:** Cedar Creek established a web site that shows the three results of this project. The web site URL is: [www.cedarcreek.umn.edu/about/supporters/LCCMR](http://www.cedarcreek.umn.edu/about/supporters/LCCMR)

- IX. Location:** Anoka County, East Bethel Township, and Isanti County, Athens Township, within the bounds of Cedar Creek. Headquarters Zip Code 55005.
- X. REPORTING REQUIREMENTS:** : Periodic work program progress reports will be submitted not later than December 15, 2005, June 15, 2006, December 15, 2006, June 15, 2007, and December 15, 2007. A final work program report and associated products will be submitted by June 30, 2008.
- XI. RESEARCH PROJECTS:** N/A

**Attachment A: Budget Detail for 2005 Projects - Summary and a Budget page for each partner (if applicable)**

**Proposal Title:** Cedar Creek Natural History Area Interpretive Center and Restoration #11b

**Project Manager Name:** Dr. David Tilman

**LCMR Requested Dollars:** \$ 400,000

2005 LCMR Proposal Budget	<u>Result 1 Budget:</u>	<u>Amount Spent as of June 30,2008</u>	<u>Balance (June 30,2008)</u>	<u>Result 2 Budget:</u>	<u>Amount Spent as of June 30,2008</u>	<u>Balance (June 30,2008)</u>	<u>Result 3 Budget:</u>	<u>Amount Spent as of June 30,2008</u>	<u>Balance (June 30,2008)</u>	TOTAL FOR ALL BUDGET ITEM	TOTAL AMOUNT SPENT	BALANCE
	Restoration of 400 Acres to Savanna- Prairie Habitat			Construct a Science Interpretive Center to publicly demonstrate technologies for energy efficiency			Create interpretive trails					
<b>BUDGET ITEM</b>												
<b>PERSONNEL:</b>												
Summer undergraduate interns, basic site preparation and surveys	51,000	51,000	0							51,000	51,000	0
<b>DEVELOPMENT:</b>												
Science Interpretive Center				250,000	250,000	0				250,000	250,000	0
Storage building for fire equipment	20,000	20,000	0							20,000	20,000	0
Signage and access materials for interpretive trails							8,362	8,296	66	8,362	8,296	66
<b>Contracts:</b>												
Minnesota Conservation Corps, heavy site preparation	35,000	35,000	0							35,000	35,000	0
<b>Equipment / Tools:</b>												
2 ATVs equipped for prescribed	35,000	34,941	59							35,000	34,941	59
<b>Equipment Rental</b>												
Heavy equipment for restoration, including restoration of established roadway to prairie	638	638	0							638	638	0
<b>COLUMN TOTAL</b>	<b>141,638</b>	<b>141,579</b>	<b>59</b>	<b>250,000</b>		<b>0</b>	<b>8,362</b>		<b>66</b>	<b>400,000</b>	<b>399,875</b>	<b>125</b>