
Legislative-Citizen Commission on Minnesota Resources

Biennial Report
January 15, 2011



Pursuant to: M.S. 116P.09, Subd. 7

Please return this document to the LCCMR office: Room 65 State Office Building

Susan Thornton, Director

January 15, 2011

Governor Mark Dayton

Secretary of the Senate – Calvin Ludeman

Chief Clerk of the House, Albin A Mathiowetz

Chair, Senate Finance Committee, Senator Claire Robling

Chair, Senate Environment and Natural Resources Committee, Senator Bill Ingebrigtsen

Chair, Senate Energy, Utilities and Telecommunications Committee, Senator Julie Rosen

Chair, House Ways and Means Committee, Representative Mary Liz Holberg

Chair, House Environment, Energy and Natural Resources Policy and Finance Committee, Representative Denny McNamara

Legislative Reference Library (2 copies)

Transmitted herewith is the biennial report as required in M.S. 116P.09, Subd. 7 of the Legislative-Citizen Commission on Minnesota Resources (LCCMR).

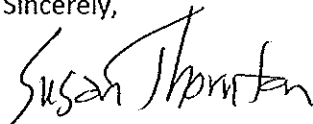
This report covers LCCMR actions from Jan. 15, 2009 (date of the previous biennial report) to January 15, 2011 including summaries of past funding accomplishments.

There is \$25,328,000 available for expenditure in each year of the FY12-13 biennium from the Environment and Natural Resources Trust Fund (Trust Fund). The LCCMR is making a biennial funding recommendation totaling \$50,623,000 to the Legislature from the Trust Fund. In addition to recommendations from the Trust Fund, \$750,000 is recommended from Federal Land and Water Conservation Funds (LAWCON) M.S. 116P.14.

The list of projects and recommended funding levels adopted on July 14, 2010 for FY2012-2013 Environment and Natural Resources Trust Fund is provided in "Section V. Recommendations." The biennial Legislative bill reflecting the July 14, 2010 action was adopted on November 18, 2010. Both actions were through affirmative votes of at least 12 of the 17 members as required by M.S. 116P.05, Subd. 2.

We look forward to presenting this information and certainly encourage questions and discussion. Thank you for the opportunity to serve the Legislature in this capacity.

Sincerely,



Susan Thornton, Director
On behalf of the LCCMR



LEGISLATIVE-CITIZEN COMMISSION ON MINNESOTA RESOURCES (LCCMR) 2009-10 Biennial Report Overview

Overview: January 1, 2009—December 31, 2010

Special points of interest:

- New logo for the Environment and Natural Resources Trust Fund introduced in 2009.
- \$51.6 million was recommended and approved to go toward 134 individual projects around the state (ML 2009, ML 2010).
- For FY 2012-13, \$51.4 million is being recommended to fund 92 individual projects around the state.
- During 2009-2010, LCCMR provided administration and oversight for 398 individual projects, representing approximately \$163 million in appropriations, in various stages of their timelines, ranging from developing work plans in preparation to begin to reaching completion and submitting final reports.
- LCCMR heard from numerous public and private sector environment and natural resources experts and visited natural resource sites around the state.

During the period between January 1, 2009 and December 31, 2010 the Legislative-Citizen Commission on Minnesota Resources (LCCMR):

- Submitted and received passage of two funding recommendations bills—one each to the 2009 Legislature and 2010 Legislature—providing \$51.6 million to 134 natural resources projects around the state.
- Issued two Requests for Proposal (RFP) to conduct selection process for funding recommendations to the 2010 Legislature and 2011 Legislature (the process for recommendations to the 2009 Legislature was conducted prior to January 1, 2009).
- Received, reviewed, and evaluated 481 proposals replying to the 2010 and 2011-12 RFPs. 140 proposals (163 individual projects) were selected for recommendation.
- Finalized recommendations to the 2011 Legislature of \$51.4 million to 92 projects around the state (bill introduction after December 31, 2010).
- Conducted peer review process for 39 research projects recommended for funding.
- Administered 398 open projects, representing approximately \$163 million in appropriations, in various stages of their timelines, 144 of which reached completion in 2009-10, including projects begun in 2003 (1), 2005 (11), 2006 (4), 2007 (76), 2008 (53), 2009



Western prairie-fringed orchid (*Platanthera praeclara*) growing on Touch the Sky Northern Tallgrass Prairie National Wildlife Refuge near Luverne, MN—ENRTF Project Kickoff Event, 07/10/10

(2), and 2010 (1).

- Visited natural resources sites in northeastern MN, the Twin Cities metro area, and the Minnesota River Valley in Central MN.
- Collaborated with the Minnesota Lottery to create and launch a new logo for the Environment and Natural Resources Trust Fund.
- Heard from numerous natural resources experts from both the public and private sector.
- Continued support for activities protecting and enhancing Minnesota's natural resources and providing benefit over an extended period of time.

Contents:

MN's Environment and Natural Resources Trust Fund	2
2011: Project Recommendations	2
2010: Projects Funded	2
2009: Projects Funded	3
Highlights of Projects Completed or Underway	3
2011-2012: Request for Proposal (RFP)	3
About LCCMR	4
2009: Information Gathering	4

LCCMR Process

The LCCMR makes funding recommendations to the MN legislature for special environment and natural resources projects, primarily from the Environment and Natural Resources Trust Fund. These recommendations are the product of a competitive, multi-step proposal and selection process.

Each funding cycle, a Request for Proposal (RFP) is issued for funding priorities determined by the Commission based on its 6-year strategic plan and ongoing information gathering activities, including expert-led issue seminars and visits to natural resource sites around the state.

The RFP is open to everyone with innovative ideas for environment

and natural resources projects that could provide multiple ecological and other public benefits to Minnesota.

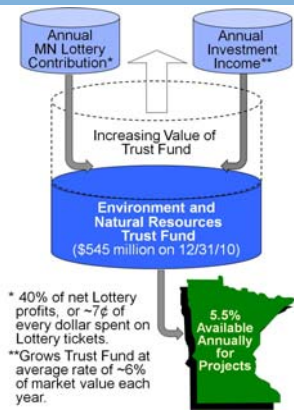
The LCCMR reviews, evaluates, and ranks all proposals submitted. A selection of the highest ranked proposals are invited to present before the LCCMR. Finally, based on the total dollars available, a subset of the proposals are chosen to recommend to the legislature for funding.

The funding recommendations go before the MN House and Senate in the form of a bill, and upon passage the bill goes to the Governor to be signed into law. Funding becomes available to projects beginning July 1 of the next fiscal year.

The LCCMR has oversight over projects funded. Projects must have a work program approved, provide ongoing project updates, and deliver a final report upon project completion.

For the recommendations to the 2011 Legislature, a total of 241 proposals requesting a combined \$162 million were received in response to the 2011-12 RFP and, from those, a total of 92 proposals were recommended for some portion of the \$50.6 million available.

The LCCMR is made up of 17 members: 5 Senators, 5 Representatives, 5 citizens appointed by the governor, 1 citizen appointed by the House, and 1 citizen appointed by the Senate.



About MN's Environment and Natural Resources Trust Fund

The Environment and Natural Resources Trust Fund (ENRTF) is a permanent fund in the state treasury established in the Minnesota Constitution through voter approval in 1988.

It holds assets that can be appropriated by law, "for the public purpose of protection, conservation, preservation, and enhancement of the state's air,

water, land, fish, wildlife, and other natural resources."

The ENRTF was created to provide a long-term, consistent, and stable source of funding for innovative activities directed at protecting and enhancing Minnesota's environment and natural resources.

The money in the ENRTF originates from a combination of

contributions and investment income. Forty percent of the net proceeds from the Minnesota State Lottery, or ~7 cents of every dollar spent playing the lottery, are contributed to the ENRTF each year. Once deposited, contributions become part of the principal balance and are invested in a combination of stocks and bonds.

ML 2011: Project Recommendations (to begin July 1, 2011)

Approximately \$50.6 million is being recommended to fund 92 individual projects around the state to begin July 1, 2011.

Natural Resource Inventory, Monitoring, Mapping, and Planning: ~\$11.1 million to obtain critical information and guide relevant decisions and efforts, including acceleration of County Biological Survey, County Geologic Atlas, State-wide Soil Survey, Wetlands Inventory, water quality monitoring, springshed mapping, local conservation planning, state-owned lands management, and recommended guidelines for prairie management, forest management, and energy and water conservation

Terrestrial and Aquatic Habitat Acquisition: ~\$12.5 million for acquisition of an estimated 3,076 acres of habitat in a com-

bination of fee title (1,766 acres) and conservation easements (1,310 acres).

Terrestrial and Aquatic Habitat Restoration, Enhancement, and Improvement: ~\$2.4 million for restoration, enhancement, and improvement activities on ~6,141 acres.

Parks and Trails Acquisition: ~\$6.5 million for acquisition of ~770 acres in state parks and trails and regional parks and trails.

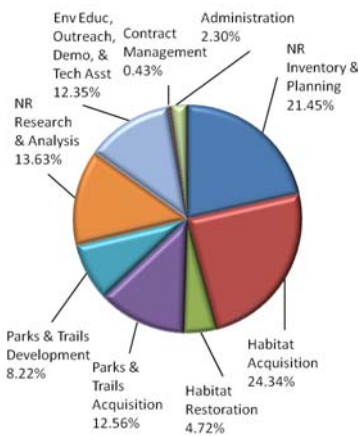
Parks and Trails Development: ~\$4.2 million for infrastructure development in Lake Vermilion State Park and regional parks and trails.

Natural Resource Research and Analysis: ~\$7 million to advance our knowledge and provide recommendations for addressing issues relating to spe-

cies protection, ecosystem conservation, bioenergy, water quality and conservation, forestry, invasive species, pollution, and sustainable building.

Environmental Education, Outreach, Demonstration, and Technical Assistance: ~\$6.3 million for efforts that will educate Minnesotans on topics including energy conservation, water conservation, natural resource science, and outdoor recreation; demonstrate options for energy efficiency; and provide training and technical assistance on pollution prevention and natural resource conservation and management.

Other: ~\$1.4 million for FY 2012-2013 LCCMR administration (\$1,182,000) and DNR contract management of projects by non-state entities (\$220,000).



ML 2010: Projects Funded (MN Laws 2010, Chapter 362)

Approximately \$26 million was appropriated to fund 73 individual projects around the state.

Natural Resource Inventory, Monitoring, Mapping, and Planning: ~\$3.6 million to allow for efforts to obtain critical information and guide relevant decisions and efforts, including acceleration of County Geologic Atlas; Wetlands Inventory; Breeding Bird Atlas; and plans and recommended guidelines for bird conservation, prairie management, forest management, farmland preservation, and watershed protection.

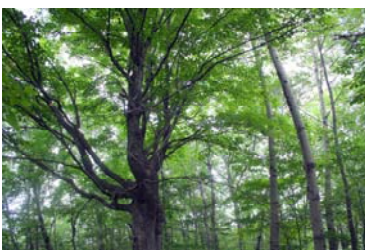
Terrestrial and Aquatic Habitat Acquisition: ~\$7.1 million for acquisition of an estimated 2,900 acres of land and habitat in a combination of fee title (590 acres) and conservation easements (2,309 acres).

Terrestrial and Aquatic Habitat Restoration and Improvement: ~\$2.4 million for restoration and improvement activities on ~5,800 acres.

Natural Resource Research and Analysis: ~\$7.3 million to advance our knowledge and provide recommendations for addressing issues relating to

aquatic contaminants, groundwater, invasive species, pollinator decline, carbon sequestration, unique ecosystems, and energy production.

Environmental Education, Outreach, Demonstration, and Technical Assistance: ~\$5.6 million for efforts that will educate Minnesotans on topics including climate change, wildlife, ecosystems, and water resources; demonstrate options for energy conservation; and provide training, experiences, and outdoor spaces to facilitate learning about the natural world.



Fraconia Bluffs Scientific and Natural Area in Chisago County, MN—LCCMR site visit, 06/17/09

ML 2009: Projects Funded (MN Laws 2009, Chapter 143)

Approximately \$25.7 million was appropriated to fund 63 individual projects around the state.

Natural Resource Inventory and Planning: ~\$7.9 million to obtain critical information and guide relevant decisions and efforts, including acceleration of County Biological Survey, County Geologic Atlas, State-wide Soil Survey, restorable wetland inventorying, springshed mapping, identification and prioritization of critical lands, and plans for natural

resource conservation and management.

Land and Habitat Acquisition: ~\$9 million for acquisition of ~2,000 acres of land and habitat in a combination of fee-title (1,195 acres) and conservation easement (880 acres).

Land and Habitat Restoration: ~\$2.2 million for restoration activities on ~5,100 acres.

Natural Resource Research and Analysis: ~\$2.7 million to advance our knowledge and provide recommendations for addressing issues relating to bal-

last water, endocrine disruptors, invasive species, artificial drainage, climate change, and resource management.

Environmental Education and Outreach: ~\$2.5 million to assist communities with local conservation efforts and develop and pilot programs for increasing residential energy efficiency statewide.

Other: ~\$1.4 million for FY 2010-2011 LCCMR administration (\$1,254,000) and DNR contract management of projects by non-state entities (\$158,000).



ENRTF funded project Minnesota Schools Cutting Carbon's Earth Day at the Capitol Event, St. Paul, MN—04/22/10

Projects Completed: January 1, 2009—December 31, 2010

Between January 1, 2009 and December 31, 2010, a total of 144 projects funded by the Environment and Natural Resources Trust Fund through the LCCMR process reached completion. This includes projects begun in 2003 (1), 2005 (11), 2006 (4), 2007 (76), 2008 (53), 2009 (2), and 2010 (1).

Major accomplishments resulting from the projects completed include:

- Foundational natural resource data acquired pertaining to native prairies, wildlife disease,

Lake Superior, shoreline, wetlands, groundwater, soils, and ecology and species distribution around the state.

- Expansion of parks, trails, and other outdoor recreational opportunities around the state by more than 1,600 acres.
- Protection of more than 6,300 acres of land and habitat through fee title and conservation easement acquisition.
- Habitat restoration activities performed on more than 32,500 acres.
- Research and analysis further-

ing goals for invasive species control, conservation drainage, increased energy independence, improved water quality and reduced water contamination, improved sustainable forestry, increased water sustainability, and understanding observed and predicted changes in climate conditions.

- Education, outreach, and technical assistance efforts on sustainable natural resource uses and practices in the areas of wildlife, groundwater, prairie stewardship, wetland restoration, and the Mississippi River.

The LCCMR follows a mission of providing long-term secure support for activities whose benefits to Minnesota's environment and natural resources are realized only over an extended period of time.

Highlights of Projects Completed or Underway

State Parks and Trails Acquisition [ML 2007, ML 2008: completed; ML 2009, ML 2010: underway]: Ongoing efforts expanding outdoor recreational opportunities around the state. ML 2007 and 2008 funds funded expansion of 5 parks and 3 trails. ML 2009 and 2010 are funding expansion of 6 parks and 1 trail.

Metro Conservation Corridors (MeCC) and MN Habitat Conservation Partnership (HCP) [ML 2007, ML 2008: completed; ML 2009, ML 2010: underway]: Partnerships of conservation organizations in metro and outstate collaborating to restore, enhance, and protect critical land and habitat throughout MN. ML 2007 and 2008 funded protection of 3,691 acres and restoration on 25,577 acres. ML 2009 and 2010 are funding

protection of 1,528 acres and restoration on 5,955 acres.

MN County Geologic Atlas [ML 2007: completed; ML 2008, ML 2009, ML 2010: underway]: Ongoing, county-by-county effort to map locations and vulnerability of MN's groundwater to support wise use and protection. ML 2007 funded progress on surveys for 2 additional counties, and ML 2008, 2009, and 2010 are funding progress on 7 counties.

MN County Biological Survey [ML 2007: completed; ML 2008, ML 2009: underway]: Ongoing, county-by-county effort to identify significant natural areas and collect and interpret data on the distribution and ecology of plants and animals throughout MN. ML 2007 and ML 2008 funded progress on surveys for 15 additional coun-

ties, and ML 2010 is funding progress on 5 counties.

Biological Control of European Buckthorn and Garlic Mustard [ML 2007: completed; ML 2010: underway]: Ongoing, multi-phase effort to develop and implement safe biological control for European buckthorn and garlic mustard. ML 2007 funds helped uncover 3 potential options for buckthorn, and ML 2010 funds will continue those studies.

MN Soil Survey [ML 2007, ML 2008: completed; ML 2009: underway]: Ongoing, county-by-county analysis and mapping of the state's soils providing critical data for protecting and managing MN habitat, wetlands, and water resources. ML 2007 and 2008 funded progress on 7 additional counties, and ML 2009 is funding progress on 5 counties.



Spring Peeper Meadow—ENRTF funded model wetland restoration at Minnesota Landscape Arboretum near Chaska, MN—07/22/09



Legislative-Citizen Commission on Minnesota Resources (LCCMR)

Room 65, State Office Building
100 Rev. Dr. Martin Luther King Jr. Blvd.
St. Paul, MN 55155

Phone: (651) 296-2406
TTY: (651) 296-9896 or 1-800-657-3550
Fax: (651) 296-1321
E-Mail: lccmr@lccmr.leg.mn
Web: www.lccmr.leg.mn

LCCMR Staff

Susan Thornton, Director
Shelley Shreffler, Assistant Director
Michael McDonough, Manager Research and Planning
Mike Banker, Communications/Outreach Manager
Diana Griffith, Commission Assistant

About LCCMR

The LCCMR is made up of 17 members (5 Senators, 5 Representatives, 5 citizens appointed by the governor, 1 citizen appointed by the House, and 1 citizen appointed by the Senate). The function of the LCCMR (formerly LCMR) is to make funding recommendations to the Minnesota Legislature for special environment and natural resource projects, primarily from the Environment and Natural Resources Trust Fund. These projects help maintain and enhance Minnesota's environment and natural resources. The LCCMR developed from a program initiated in 1963. Since 1963, over \$650 million has been appropriated to more than 1,300 projects recommended by the Commission to protect and enhance Minnesota's environment and natural resources.

Commission Members Serving During 2009-2010

Sen. Ellen Anderson
Alfred Berner—Appointed by the Governor
Jeff Broberg (Co-Vice Chair)—Appointed by the House
Rep. Lyndon Carlson
Sen. Satveer Chaudhary
Tom Cook—Appointed by the Governor [2010 only]
Sen. Dennis Frederickson (Co-Vice Chair)
Nancy Gibson (Co-Chair)—Appointed by the Governor
John Herman—Appointed by the Senate
Rep. Larry Howes (Co-Vice Chair)
Norman Moody—Appointed by the Governor
Mary Mueller—Appointed by the Governor [2009 only]
Sen. Pat Pariseau
Rep. Tom Rukavina
Rep. Ron Shimanski
Sen. Jim Vickerman (Co-Chair)
Rep. Jean Wagenius (Co-Chair)
Elizabeth Wilkens—Appointed by the Governor

Information Gathering: January 1, 2009—December 31, 2010



2,341 feet underground, Soudan Iron Mine State Park, St. Louis County, MN—LCCMR site visit, 08/19/09

In 2009-10, the LCCMR engaged in numerous activities that informed its priorities for projects it recommended for funding to the MN Legislature.

Natural resources sites around the state were visited:

- 2009 included a visit to the St. Croix River Valley to learn about issues pertaining to watersheds, Scientific and Natural Areas, prairie restoration, endangered species, invasive species, groundwater and surface water interac-

tions, and Metropolitan Regional Parks, and a visit to Northeastern MN to examine issues pertaining to mining, forestry, renewable energy, state parks and trails, species protection, and water quality.

- 2010 included a visit to the Minnesota River Valley in Central MN to examine issues pertaining to fisheries, water quality, and rare and unique habitats, and a visit to the Mississippi River corridor in the Metro area to examine issues pertaining to the Mississippi River Gorge.

To determine possible areas of coordination and collaboration with other natural resources bodies, in 2009 the LCCMR held a joint meeting with the Lessard-Sams Outdoor Heritage Council (LSOHC), and in 2010 the LCCMR went on a joint site visit with the LSOHC and the Clean Water Council.

In addition to the presentations heard on site visits and the 169 interactive presentations the LCCMR chose to hear from project proposers responding to the RFPs during this period, the LCCMR also heard several presentations and expert-led issue seminars on topics including:

- Gulf oil spill and MN's migrating birds
- Ecosystem services
- Shoreline regulations
- Conservation easements
- Natural Resource and community conservation planning
- New state grants management policies
- Environmental and outdoor education
- Emerging tree diseases and pests

- Updates from current projects
- Statewide water planning

Finally, public input on prioritization for Environment and Natural Resources Trust Fund expenditures continued to be gathered through an online survey on the LCCMR website.



Members of LCCMR, Lessard-Sams Outdoor Heritage Council, and Clean Water Council hearing from DNR at granite rock outcrop site near Minnesota River in Renville County, MN—LCCMR joint site visit, 07/21/10

Commission Members

LCCMR Membership January 1, 2009 – January 1, 2011

REPRESENTATIVES

Rep. Lyndon Carlson

Rep. Larry Howes*

Rep. Tom Rukavina

Rep. Ron Shimanski

Rep. Jean Wagenius*

SENATORS

Sen. Ellen Anderson

Sen. Satveer Chaudhary

Sen. Dennis Fredrickson*

Sen. Pat Pariseau

Sen. Jim Vickerman*

APPOINTED NON-LEGISLATIVE

MEMBERS

Alfred Berner, Gov. appt.
(term ends – 1/7/2013)

Jeff Broberg*, House appt.
(term ends – 1/6/2014)

Nancy Gibson*, Gov. appt.
(term ends – 1/2/2012)

John Herman, Senate appt.
(term ends – 1/7/2013)

Norm Moody, Gov. appt.
(term ends – 1/7/2013)

Elizabeth Wilkens, Gov. appt.
(term ends – 1/6/2014)

Tom Cook, Gov. appt.
*(term began – 6/22/2010 and
term ends – 1/6/2014)*

Mary Mueller, Gov. appt.
(term ended – 6/22/2010)

*Denotes Executive Committee Members

LCCMR Staff

Susan Thornton, Director
Shelley Shreffler, Assistant Director
Michael McDonough, Manager Research and Planning
Mike Banker, Communications/Outreach Manager and Project Analyst
Diana Griffith, Commission Assistant

Legislative-Citizen Commission on Minnesota Resources
Room 65, State Office Building
100 Rev. Dr. Martin Luther King Jr. Blvd.
St. Paul, MN 55155

Phone: (651) 296-2406
TTY: (651) 296-9896 or 1-800-657-3550
Fax: (651) 296-1321
E-Mail: lccmr@lccmr.leg.mn
Web: www.lccmr.leg.mn

Legislative-Citizen Commission on Minnesota Resources
Biennial Report to the Legislature, M.S. 116P.09, Subd. 7
January 15, 2011

TABLE OF CONTENTS

I. Strategic Plan

“a copy of the current strategic plan;”

A. Six Year Strategic Plan

B. Request for Proposal Funding Priorities for FY2011 and FY2012-2013

II. Projects Funded Preceding Biennium

“a description of each project receiving money from the trust fund during the preceding biennium;”

Project Abstracts for Laws 2009 and 2010

III. Completed Research Projects

“a summary of any research project completed in the preceding biennium;”

Project Abstracts of all projects completed since January 15, 2009, including research.

IV. Agency Implementation

“recommendations to implement successful projects and programs into a state agency’s standard operations;”

V. Recommendations

“to the extent known by the commission, descriptions of the projects anticipated to be supported by the trust fund during the next biennium;”

VI. Revenues and Distributions

“the source and amount of all revenues collected and distributed by the commission, including all administrative and other expenses;”

VII. Assets and Liabilities

“a description of the assets and liabilities of the trust fund;”

VIII. Findings to Legislature

“any findings or recommendations that are deemed proper to assist the legislature in formulating legislation;”

IX. Gifts and Donations

“a list of all gifts and donations with a value over \$1,000;”

X. Environmental Spending Comparisons

“a comparison of the amounts spent by the state for environment and natural resources activities through the most recent fiscal year; and”

XI. Compliance Audit

“a copy of the most recent compliance audit.”

APPENDIX A

- Environment and Natural Resources Trust Fund Constitutional Language amended 11/3/98
- M.S. 116P, The Minnesota Environment and Natural Resources Trust Fund (Trust Fund)
- M.S. 116P.14, Federal Land and Water Conservation Funds (LAWCON)
- M.S. 116Q.02, Great Lakes Protection Account
- Section 4.071, Subdivision 2 Oil Overcharge

I. Strategic Plan / RFP

“a copy of the current strategic plan...”

- A. Six Year Strategic Plan – Adopted
January 16, 2009
- B. Request for Proposal (RFP)
 - Funding priorities adopted
January 12, 2010 for FY2012-2013
 - Funding Priorities adopted
January 16, 2009 for FY2011
 - Application Process

LEGISLATIVE-CITIZEN COMMISSION

ON

MINNESOTA RESOURCES (LCCMR)

Six-Year Strategic Plan for the Environment and Natural Resources Trust Fund

Adopted
January 16, 2009

Sen. Ellen Anderson, Al Berner, Jeff Broberg, Rep. Lyndon Carlson, Sen. Satveer Chaudhary,
Sen. Dennis Frederickson, Nancy Gibson, John Herman, John Hunt, Mary Mueller, Rep. Tom
Rukavina, Sen. Pat Pariseau, Sen. Jim Vickerman, Rep. Jean Wagenius

Legislative-Citizen Commission on Minnesota Resources
100 Rev. Dr. Martin Luther King Jr. Blvd.
Room 65 State Office Building
St. Paul, MN 55155

TABLE OF CONTENTS

I. Trust Fund Vision and Mission Statements.....	pg. 2
II. Background.....	pg. 2
- MN Constitution Art. XI, Sec. 14: Environment and Natural Resources Trust Fund	
- MN Statutes 2008, Chapter 116P.08: Definitions	
- MN Statutes 2008, Chapter 116P.08: Trust fund expenditures; exceptions; plans	
III. Six-Year Strategic Plan for the Environment and Natural Resources Trust Fund	pg. 4
- Process for Development of the Six-Year Strategic Plan	
- Summary of Key Natural Resource Issues and Strategic Framework	
- Goals	
- Strategies	
- Outcomes	
Appendix A: Statewide Conservation and Preservation Plan: Executive Summary and Short Description of Recommendations	pg. 11

I. Trust Fund Vision and Mission Statements

Trust Fund Vision Statement

All Minnesotans have an obligation to use and manage our natural resources in a manner that promotes wise stewardship and enhancement of the state's resources for ourselves and for future generations. The Trust Fund is a perpetual fund that provides a legacy from one generation of Minnesotans to the many generations to follow. It shall be used to preserve, protect, restore and enhance both the bountiful and the threatened natural resources that are the collective heritage of every Minnesotan. It shall also be used to nurture a sense of responsibility by all and to further our understanding of Minnesota's resource base and the consequences of human interaction with the environment.

Trust Fund Mission Statement

The mission of the Trust Fund is to ensure a long-term secure source of funding for environmental and natural resource activities whose benefits are realized only over an extended period of time.

Future Funding Focus Areas

In implementing the Six-Year Strategic Plan, the Commission will identify annual focus areas for funding through the RFP process. In selecting the areas of funding focus, the LCCMR will maintain a continuing awareness of issues identified by the Statewide Conservation and Preservation Plan developed by the University of Minnesota, Institute on the Environment, public input, the Commission's evaluation of natural resource issues, and major funding initiatives identified by the MN legislature.

II. Background

MN Constitution Art. XI, Sec.14

Environment and Natural Resources Fund

A permanent environment and natural resources trust fund is established in the state treasury. Loans may be made of up to five percent of the principal of the fund for water system improvements as provided by law. The assets of the fund shall be appropriated by law for the public purpose of protection, conservation, preservation, and enhancement of the state's air, water, land, fish, wildlife, and other natural resources. The amount appropriated each year of a biennium, commencing on July 1 in each odd-numbered year and ending on and including

June 30 in the next odd-numbered year, may be up to 5-1/2 percent of the market value of the fund on June 30 one year before the start of the biennium. Not less than 40 percent of the net proceeds from any state-operated lottery must be credited to the fund until the year 2025. [Adopted, November 8, 1988; Amended, November 6, 1990; November 3, 1998]

Minnesota Statutes 2008, Chapter 116P.02

116P.02 Definitions

Subd. 5. **Natural resources.** "Natural resources" includes the outdoor recreation system under section 86A.04 and regional recreation open space systems as defined under section 473.351, subdivision 1.

Minnesota Statutes 2008, Chapter 86A

86A.04 COMPOSITION OF SYSTEM

The outdoor recreation system shall consist of all state parks; state recreation areas; state trails established pursuant to sections [84.029](#), [subdivision 2](#), [85.015](#), [85.0155](#), and [85.0156](#); state scientific and natural areas; state wilderness areas; state forests; state wildlife management areas; state aquatic management areas; state water access sites, which include all lands and facilities established by the commissioner of natural resources or the commissioner of transportation to provide public access to water; state wild, scenic, and recreational rivers; state historic sites; state rest areas, which include all facilities established by the commissioner of transportation for the safety, rest, comfort and use of the highway traveler, and shall include all existing facilities designated as rest areas and waysides by the commissioner of transportation; and any other units not listed in this section that are classified under section [86A.05](#). Each individual state park, state recreation area, and so forth is called a "unit."

Minnesota Statutes 2008, Chapter 473

473.351 METROPOLITAN AREA REGIONAL PARKS FUNDING

Subd. 1. Definitions.

(d) "Regional recreation open space systems" means those parks that have been designated by the Metropolitan Council under section [473.145](#).

Minnesota Statutes 2008, Chapter 116P.08

116P.08 Trust fund expenditures; exceptions; plans

Subd. 1. **Expenditures.** Money in the trust fund may be spent only for:

- (1) the reinvest in Minnesota program as provided in section [84.95](#), subdivision 2;
- (2) research that contributes to increasing the effectiveness of protecting or managing the state's environment or natural resources;
- (3) collection and analysis of information that assists in developing the state's environmental and natural resources policies;
- (4) enhancement of public education, awareness, and understanding necessary for the protection, conservation, restoration, and enhancement of air, land, water, forests, fish, wildlife, and other natural resources;
- (5) capital projects for the preservation and protection of unique natural resources;
- (6) activities that preserve or enhance fish, wildlife, land, air, water, and other natural resources that otherwise may be substantially impaired or destroyed in any area of the state;
- (7) administrative and investment expenses incurred by the State Board of Investment in investing deposits to the trust fund; and
- (8) administrative expenses subject to the limits in section [116P.09](#).

Subd. 2. **Exceptions.** Money from the trust fund may not be spent for:

- (1) purposes of environmental compensation and liability under chapter 115B and response actions under chapter 115C;
- (2) purposes of municipal water pollution control under the authority of chapters 115 and 116;
- (3) costs associated with the decommissioning of nuclear power plants;
- (4) hazardous waste disposal facilities;
- (5) solid waste disposal facilities; or
- (6) projects or purposes inconsistent with the strategic plan.

III. Six-year Strategic Plan for the Environment and Natural Resources Trust Fund

A. PROCESS FOR DEVELOPMENT OF THE SIX-YEAR STRATEGIC PLAN -- as required in M.S. 116P.08, Subd. 3

The Six-Year Strategic Plan is to guide the work and process used by the LCCMR in making recommendations for Trust Fund expenditures. Specifically, the Six-Year Strategic Plan, as required by statute, is to provide short and long-term goals and strategies for the Trust Fund expenditures, require measurable outcomes for the expenditures, and identify areas of emphasis for funding.

In developing the Six-Year Strategic Plan, the LCCMR used the Statewide Conservation and Preservation Plan, developed with financial support from the Environment and Natural Resources Trust Fund by the University of Minnesota Institute on the Environment, along with information gathered during 2007 and 2008 natural resource presentations and site visits. The LCCMR continues to request information from technical experts, citizens, agencies, local units of government, private, and nonprofit organizations to assist it in identifying the most pressing natural resources issues facing Minnesota and the opportunities to address them.

The LCCMR will continue to use the Statewide Conservation and Preservation Plan as a guide in developing Requests for Proposals (RFPs).

B. SUMMARY OF KEY NATURAL RESOURCE ISSUES AND STRATEGIC FRAMEWORK USED TO IDENTIFY STRATEGIC PLAN GOALS

Summary of Key Natural Resource Issues identified in the Preliminary Statewide Conservation and Preservation Plan are:

- Land and water habitat fragmentation, degradation, loss and conversion
- Land use practices
- Transportation
- Energy Production and Use
- Toxic contaminants
- Impacts on resource consumption
- Invasive species

These are the issues that, if addressed, would protect and conserve Minnesota's natural resources of air, water, land, wildlife, fish and outdoor recreation to the greatest degree.

The Statewide Conservation and Preservation Plan focuses on the first four key natural resource issues. The remaining three issues are not included in the plan due to budget and time factors and will be given consideration in future plan updates.

Five Areas of the Strategic Framework in the Statewide Conservation and Preservation Plan are:

- Integrated Planning
- Critical Land Protection
- Land and Water Restoration and Protection

- Sustainability Practices
- Economic Incentives for Sustainability

The recommendations in the Statewide Conservation and Preservation Plan were organized into the Strategic Framework and provide a comprehensive and integrated environmental strategic plan.

The recommendations within the Strategic Framework are designed to conserve and protect Minnesota's six statutorily defined natural resources in a comprehensive approach, while being mindful of demographic change, public health, the state's economy, and climate change.

Future elements of a Statewide Conservation and Preservation Plan will include additional in-depth review of natural resource issues such as toxic contaminants, invasive species, groundwater and surface water sustainability, mining, and emerging natural resource issues.

C. GOALS - SIX-YEAR STRATEGIC PLAN

The strategic framework laid out in the Statewide Conservation and Preservation Plan provides an integrated approach to resource conservation and protection. The following goals address one or more of the strategic framework areas.

Land and Water Protection

- Protect and conserve land and water (surface and ground) resources that are important for overall ecosystem integrity.
 - Provide protection to fragile or unique natural resources, such as prairies, shorelands, trout streams, groundwater resources, surface water flows, wetlands, fens, and aquatic habitat where further development or neglect could cause irreparable harm or loss.
 - Protect land resources such as large contiguous tracts of forests, prairies that are threatened by fragmentation, high quality natural areas such as those listed in the county biological survey, and important habitat areas.
 - Protect and promote habitat, native species, and water quality through land protection, acquisition, and land use practices.
 - Protect and promote habitat, native species, and water quality through protection from invasive species.

- Protect and promote habitat, native species, and water quality through reduction and elimination of harmful environmental contaminants.

Research, Planning, and Demonstration

- Improve natural resource data management, conservation, and use statewide through the acquisition, management, and distribution of critical natural resource data by funding efforts to generate natural resource “foundation documents” to increase accuracy, efficiency, and ease of access to the data (including maps, inventories, and surveys).
- Address emerging issues and provide critical information to assist in our understanding and wise management of natural resources.
- Support research, planning, and/or demonstration projects that protect and conserve sensitive lands and surface and ground water resources, and ecologic integrity.
- Support evaluation of climate change impacts and reduction strategies.
- Support community-based conservation planning.

Encourage Participation in Outdoor Recreation, Hunting and Fishing

- Promote interest and participation in angling, hunting, outdoor recreation, and environmental and natural resource education. Partnerships to accomplish this goal are encouraged.
- Acquire, enhance, construct, manage, and maintain a variety of accessible outdoor recreation opportunities throughout the state.

Public Education and Information

- Provide public dissemination of important natural resource information so that we have informed citizens able to assist public and private planners and resource managers in managing our natural resources.

- Promote environmental literacy of Minnesota’s students and citizens so that they can apply informed decision-making processes to maintain a sustainable lifestyle.

Selection Criteria

- Review projects based on the following criteria: meeting priority goals, leverage, technical standards, capabilities to manage projects, multiple benefits, and the likelihood of meaningful results.

D. STRATEGIES - SIX-YEAR STRATEGIC PLAN

Priority will be given to projects providing benefits to multiple natural resources or to projects providing multiple benefits:

- Identify, protect, and enhance strategic land areas that make the largest contribution to multiple benefits for conservation and increase the management of those lands to enhance the conservation, quality, and diversity of natural resources.
- Establish statewide highest value habitat corridors using consistent conservation biology methodology and criteria for habitat, water quality and quantity, and native species.
- Acquire the most recent and accurate baseline natural resource data on a regular basis – data such as topography, parcel and land cover, soil and geological survey, and ground water quality and quantity.
- Identify and manage lands suited for human activity by using best management conservation practices to minimize the negative effects on natural resources.
- Increase understanding of potential effects of climate change on resources and develop strategies for reducing the impact of climate change on natural resources.
- Increase understanding of effects of contaminants on natural resources, including ground water, and develop strategies for reducing contamination.

- Increase public understanding of the need for better conservation, preservation, and restoration of Minnesota's habitats and landscapes.
- Develop strategies for delivery of environmental education to Minnesota students and residents at school, home, work, and play.
- Develop strategies to prevent introductions and reduce spread of aquatic and terrestrial invasive species and restore or reestablish terrestrial or aquatic habitats impacted by invasive species.
- Develop land use strategies for sustainable, renewable energy production (electricity and fuels) that protect, enhance and restore native species, water quality, habitat, and prairies.
- Evaluate renewable energy options in Minnesota, including energy conservation, based on greenhouse gas and other emissions reductions, surface and ground water use, effects on the economy, and use by the electric and transportation sectors.

E. OUTCOMES

- Funding recommendations are consistent with and accelerate implementation of the Statewide Conservation and Preservation Plan and other related natural resource plans or recommendations, including
 - Forest Resource Council Guidelines
 - Minnesota Governor's Council on Geographic Information
 - Minnesota Department of Natural Resources plans
 - Scientific and Natural Areas Program Long Range Plan
 - Prairie Pothole Joint Venture Implementation Plan
 - Aquatic Management Area Acquisition Plan
 - Wildlife Strategic Plan
 - State Comprehensive Outdoor Recreation Plan

- Minnesota Pollution Control Agency GreenPrint for Minnesota: State Plan for Environmental Education
 - Minnesota Climate Change Advisory Group final report
 - Minnesota Invasive Species Advisory Council priorities
 - Metropolitan Council 2030 Regional Park Policy Plan
-
- Complete acquisition of baseline natural resource data, including the County Biological Survey, Soil Survey, wetlands inventory, restorable wetlands inventory, and the geologic atlas by 2020.
 - Funding recommendations in the aggregate include work in all ecoregions, as defined by the Minnesota Department of Natural Resources.
 - To the extent possible, funding recommendations support the creation and continuation of “green jobs” in Minnesota.

Appendix A

Statewide Conservation and Preservation Plan:
Executive Summary and Short Description of
Recommendations

Executive Summary

*Statewide Conservation And Preservation Plan
Final Plan • • June 30, 2008*

Revised November 1, 2008

EXECUTIVE SUMMARY

The remarkable place known as Minnesota is situated at the convergence of the Great Lakes, the Great Rivers, and the Great Plains. The citizens of Minnesota cherish and take pride in the abundant and varied natural resources of this place. We also value our quality of life and our standard of living, and desire the same for our children. All of these values and desires are intricately connected: continued economic prosperity depends on a healthy and sustainable environment, and vice versa. To foster the conditions we value, we must balance long-term plans for conserving and protecting our priceless natural resources with those for ensuring a healthy public and healthy economy. This document, the Minnesota Statewide Conservation and Preservation Plan (SCPP), lays out a deliberate strategy for doing so in a unified, integrated fashion, that employed an interdisciplinary approach with multiple perspectives and expertise.

The Environmental and Natural Resources Trust Fund funded a unique partnership among the University of Minnesota and the consulting firms of Bonestroo and CR Planning to evaluate the state's natural resources, identify key issues affecting those resources, and make recommendations for improving and protecting them. More than 125 experts, including University scientists and public and private natural resource planners and professionals, participated in the 18-month effort.

The team addressed Minnesota's Constitutionally identified natural resources of air, water, land, wildlife, fish, and outdoor recreation in two distinct phases. In the first phase of the project, the project team assessed the past and present condition of each of these six natural resources. They identified and described (where possible) the drivers of change immediately impacting them, and identified key issues that could be addressed to protect and conserve

them in an integrated fashion. This information was published as the Preliminary Plan (<http://www.lccmr.leg.mn>). In the second phase of the project, the team addressed the key issues in depth, developing recommendations that would positively impact as many natural resources as possible while taking into account demographic change, public health, economic sustainability, and climate change. These recommendations then were synthesized into a framework with five strategic areas. Recommendations were identified as being either policy and action recommendations (those that could be put into effect directly by the legislature) or recommendations that add to our knowledge infrastructure (research needs, data gathering and monitoring needs, or educational activities). This framework and its recommendations were published as the Final Plan (<http://www.lccmr.leg.mn>). The steps and outcomes for the entire project are shown in Figure 1.

Preliminary Plan. Initially the team identified drivers of change that negatively impact each natural resource. These included both proximate drivers, those that are closest to and have the most direct impact on the resource (e.g., nutrient loading impacting water quality) and higher-order drivers, which are those that are further removed from the resource and impact the resource through other drivers of change (e.g., shoreline development causing the nutrient loading that impacts water quality). The team mapped these relationships among each other, noting that many drivers of change impact multiple resources and a given resource is impacted by multiple drivers of change. Finally, the team used a matrix prioritization process to objectively identify the key issues that, if addressed, would benefit the greatest number of natural resources to the greatest degree. The seven key areas identified were:

- Land and water habitat fragmentation, degradation, loss, and conversion

- Land use practices
- Transportation
- Energy production and use
- Toxic contaminants
- Impacts on resource consumption
- Invasive species

Each of these key issues is more fully described in the Preliminary Plan.

Final Plan. A subset of these issues was chosen for investigation in the second phase of the project. The key issues for which recommendations are made in this report are:

- Land and water habitat fragmentation, degradation, loss, and conversion
- Land use practices
- Transportation
- Energy production and use, and mercury as a toxic contaminant related to energy production

Figure 2 shows the action or policy recommendations for each of the key issues, arranged according to the degree of integrated benefits across all values associated with natural resources. The knowledge infrastructure and mercury recommendations were not evaluated by this process, and are not included in this figure. This gives an overall snapshot of how much integrated value a given recommendation has. For example, the first recommendation under the key issue of habitat has significant impact across the majority of the resource values, and has little impact on air quality and human health. This figure also identifies which recommendations benefit a given resource value the most. For example, habitat and land use–forestry recommendations have the most impact on biodiversity.

The Final Plan is organized in such a way as to take the reader through the project evolution in great detail. Following this Executive Summary and an Introduction section, the overall Strategic Framework is presented and described (also see below) to provide a context for the series of sec-

tions that follow, in which each of the key issues is described in detail. The section on land and water Habitat Recommendations contains a unique approach to priority mapping that combines geo-spatial data on a series of stress indicators that culminate in maps showing areas of the state with highest water and land habitat quality superimposed with areas of highest ecological stress. These maps help decision makers and natural resource managers prioritize which parts of the state to protect, conserve, or restore in order to best address our water and habitat natural resources. The Land Use Recommendations section is organized around three main types of land use, including urban/community land use practice, agricultural land use practice, and forest land use practice. Recommendations focus on water management, crop management, low impact development, and adoption of best practices for all types of land use. This is followed by a section on Transportation Recommendations, which stresses how transportation development choices are interwoven with land use choices, and have multiple impacts on water quality, habitat fragmentation, energy use, and air quality. This section also recognizes the current inefficiencies in permitting for transportation projects. The next section on Energy Recommendations focuses specifically on the strategies for renewable energy and conservation practices that will reduce dependence on fossil fuels and promote environmental co-benefits. It also links these recommendations directly to promoting a health economy. This section also addresses how decreases in fossil fuel use might change mercury emissions in the state, and how changes in these emissions translate to changes in concentrations of this toxic chemical in fish as a result.

The Final Plan contains nine appendices. The first contains a list of the recommendations that resulted from the Preliminary Plan; the second contains a list of the project participants and their affiliations; the third is a detailed report on the mercury assessment referenced in the Energy Recommendations section; the fourth is a summary of a study that predicts the future impacts of climate change on biodiversity in

Minnesota; the fifth is a cost benefit analysis of 7 of the major recommendations; the sixth is the result of an expert panel discussion of the value and investment prioritization of the action and policy recommendations; the seventh is a summary of the public engagement and outreach efforts and a summary of the public comments; the eighth is a list of the sources used in preparing the Plan; and the ninth is a short description of each of the recommendations in the Final Plan.

The Strategic Framework

The collection of recommendations was organized into a comprehensive framework, the Strategic Framework for Integrated Resource Conservation and Preservation, as shown in Figure 3. The five strategic areas of the framework identified at the top of the five boxes, are:

- Integrated Planning
- Critical Land Protection
- Land and Water Restoration and Protection
- Sustainability Practices
- Economic Incentives for Sustainability

Recommendations for each of these strategic areas are listed within a given box. Action or policy recommendations are at the top, with recommendations having the broadest impact across multiple resources listed first, followed by those that are more targeted or specific in their scope. Recommendations for building the knowledge infrastructure for that strategic area are at the bottom of the box. All of these recommendations are described in detail in the Final Plan.

This framework is a comprehensive and integrated environmental strategic plan. The recommendations taken together provide a holistic look, and are not meant to be viewed in isolation or to be acted on in a piecemeal fashion. Each of the strategic areas is summarized below.

Strategic Areas

Integrated Planning

Natural resource management is interwoven within a larger fabric of economic health, complex regulatory frameworks, human health, and changing demographics and climate. No one agency can address this comprehensively, nor can it be done in individual agency stovepipes. In addition, there are multi-jurisdictional responsibilities on the geographic scale, from communities to small units of government to soil and watershed districts to statewide agencies.

Planning, whether for transportation, energy, community development, water resources, agriculture, or forestry, should be integrated across all agencies and across the multijurisdictional scale. Doing so can make planning more efficient by removing redundancies. Our strongest, most effective federal environmental laws require cross-agency review or partnership, and this approach should be embraced on the state level for holistic natural resource protection.

Our recommendations address land use practices, transportation policy, and energy production and use policy as related to natural resource protection. For example, we specifically recommend the development of a state land use, development, and investment guide to align investment objectives across social, environmental, and economic sectors. We recommend that the state embrace a conservation-based community planning approach. Enhanced cross-consultation in governance and planning for transportation, land development, and energy projects is essential for protecting and conserving our natural resources.

Critical Land Protection

Be it farmland, wetlands, greenways in urban areas, or forestland, a clear and comprehensive strategy must be developed that establishes long-term and short-term protection and acquisition priorities. An array of perspectives should inform this strategy, integrating needs for biodiversity protection, critical agricultural land protection, ecological services, recreational opportunities, and opportunities for climate change adaptation and/or mitigation.

This strategy should build on the excellent work already accomplished by the DNR critical habitat studies, the Metro and Outstate Conservation Corridors initiatives, and the work of many nonprofit land-protection organizations.

Our recommendations in this strategic area focus on the protection by easement or acquisition of critical stream and lake shorelines, priority land habitats, and large blocks of forestland.

Land and Water Restoration and Protection

This strategic area addresses both the restoration of critical land and water habitat and the protection of strategic land and water habitat that has not yet been degraded. It not only addresses the inherent and intrinsic direct benefits of habitat restoration and protection, but also emphasizes the benefits of such strategy for strengthening biodiversity and enhancing resilience to climate change. The recommendations in this area reinforce and strengthen Minnesota cultural values, ethics, appreciation of outdoor recreation, and economic health.

The recommendations include specific actions to restore shallow lakes, wetlands and wetland associated watersheds, and the habitats contained within lakes and rivers, as well as actions to protect critical landscapes.

Sustainability Practices

A healthy environment requires a healthy economy, and a sustainable economy requires a sustainable environment. To reach both goals requires promoting, facilitating, encouraging, and regulating practices that will lead to a sustainable environment and economy. These sustainable practices must cross multiple fronts - sustainable agriculture, sustainable forestry, sustainable water resources, and sustainable economy and standard of living - all in the context of energy production, shifting demographics, and climate change.

Specific recommendations promote the sustainable management of forestlands and action to keep water on the landscape. These include reviewing drainage policy and actions to move water more slowly across and through the landscape to return to more natural conditions to reduce flooding, improving water quality, and improving biological diversity through habitat protection.

Economic Incentives for Sustainability

Moving toward sustainable practice requires specific incentives to move the state and its citizens and stakeholders in a transformative direction. These are broad-scale ideas for achieving a sustainable economy specifically through natural resource policies: Energy policy, agricultural policy, forestry policy, and transportation policy can be used to grow and nurture Minnesota's economic future. For example, the team recommends the development and implementation of incentive programs to develop renewable energy programs and to promote a successful transition of Minnesota's vehicle fleet to electric power.

Minnesotans share a vision for a healthy and sustainable future. This framework of strategic recommendations is a collective roadmap for moving forward to achieve this future. We hope that the citizens, resource managers, and policy-makers of the state embrace this opportunity to deliberately protect and conserve Minnesota's remarkable natural resources before they are further degraded or lost.

Figure 1. Process and outcomes of the Statewide Conservation and Preservation Plan

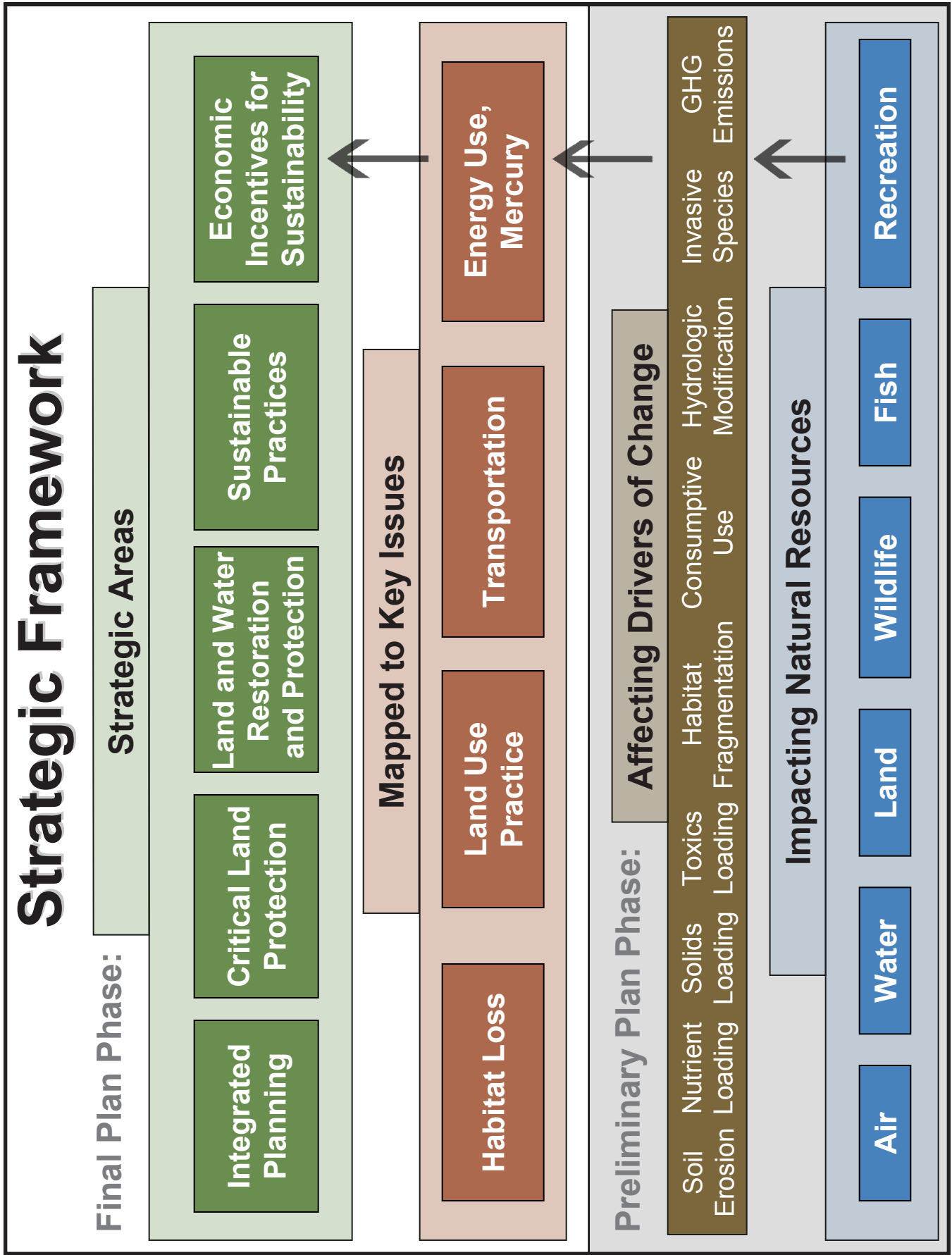


Figure 2. Natural resource values assessment of policy and action recommendations

Natural Resource Values Assessment of Recommendations

LEGEND: ● = Critical Impact ○ = Significant Impact ○ = Negligible Impact												
Number	Recommendation	Air Quality	Water Quality/Quantity	Habitat Quality	Terrestrial Land Quality	Soil/Land Quality	Human Health	Biodiversity	Community Health	Economic Health	Recreational/Cultural/Spiritual/Aesthetic Value	Climate Change Mitigation/Adaptation
H2	Protect critical shoreland of streams and lakes	○	○	●	●	●	●	○	●	●	●	●
H1	Protect priority land habitats	○	○	●	●	●	●	○	●	●	●	●
H4	Restore and protect shallow lakes	○	○	●	●	●	●	○	●	●	●	●
H5	Restore land, wetlands and wetland-associated watersheds	○	○	●	●	●	●	○	●	●	●	●
H6	Protect and restore critical in-water habitat of lakes and streams	○	○	●	●	●	●	○	●	●	●	●
H7	Keep water on the landscape	○	○	●	●	●	●	○	●	●	●	●
H8	Review and analyze drainage policy (ditch laws)	○	○	●	●	●	●	○	●	●	●	●
H3	Improve connectivity and access to recreation	○	○	○	○	○	○	○	○	○	○	○
LU1	Fund and implement a state Land Use Development and Investment Guide	○	○	○	○	○	○	○	○	○	○	○
LU2	Support local and regional conservation-based community planning	○	○	○	○	○	○	○	○	○	○	○
LU3	Ensure protection of water resources in urban areas	○	○	○	○	○	○	○	○	○	○	○
LU4/E4	Transition renewable fuel feedstocks to perennial crops	○	○	○	○	○	○	○	○	○	○	○
LU5	Reduce streambank erosion through reduction in peak flows	○	○	○	○	○	○	○	○	○	○	○
LU6	Reduce upland and gully erosion through soil conservation practices	○	○	○	○	○	○	○	○	○	○	○
LU8	Protect large blocks of forest land	○	○	○	○	○	○	○	○	○	○	○
LU10	Support and expand sustainable practices on working forested lands	○	○	○	○	○	○	○	○	○	○	○
T1	Align transportation planning across all agencies; streamline and integrate environmental transportation project review	●	○	○	○	○	○	○	○	○	○	○
T2	Reduce per capita vehicle miles of travel	○	○	○	○	○	○	○	○	○	○	○
T3	Develop and implement transportation policies that minimize impacts on natural resources	○	○	○	○	○	○	○	○	○	○	○
E1	Develop coordinated laws, policies and procedures across state agencies	○	○	○	○	○	○	○	○	○	○	○
E13	Invest in research and policies for "green payment" program	○	○	○	○	○	○	○	○	○	○	○
E17	Promote policies and incentives that encourage C-neutral businesses, homes, communities and other institutions	○	○	○	○	○	○	○	○	○	○	○
E2	Invest in farm and forest preservation to prevent fragmentation due to development	○	○	○	○	○	○	○	○	○	○	○
E18	Implement policies and incentives to lower energy use of housing stock	○	○	○	○	○	○	○	○	○	○	○
E16	Provide incentives to transition a portion of Minnesota's vehicle fleet to electrical power and renewable electricity production	○	○	○	○	○	○	○	○	○	○	○
E21	Develop standards and incentives for energy capture from municipal sanitary and solid waste, and minimize landfill options	○	○	○	○	○	○	○	○	○	○	○
E19	Promote policies and strategies to implement smart meter and smart grid technologies	○	○	○	○	○	○	○	○	○	○	○
E14	Investigate opportunities to provide tax incentives for individual renewable energy investors	○	○	○	○	○	○	○	○	○	○	○
E20	Develop incentives to encourage widespread adoption of passive solar and shallow geothermal heat pumps in new construction	○	○	○	○	○	○	○	○	○	○	○
E15	Invest in efforts to develop community-based energy platforms	○	○	○	○	○	○	○	○	○	○	○



Note: Policy and action recommendations are grouped by topic (Habitat, Land Use, etc.) and then ordered starting with those recommendation having the broadest impact across multiple resource values followed by those having more targeted impact.

Strategic Framework For Integrated Resource

INTEGRATED PLANNING 		CRITICAL LAND PROTECTION 		LAND AND WATER RESTORATION AND PROTECTION 	
Rec. No.	Broad Policy and Action Recommendations	Rec. No.	Broad Policy and Action Recommendations	Rec. No.	Broad Policy and Action Recommendations
E1	Develop coordinated laws, policies and procedures across state agencies	H2	Protect critical shorelands of streams and lakes	H4	Restore and protect shallow lakes
LU1	Fund and implement a state Land Use Development and Investment Guide	H1	Protect priority land habitats	H5	Restore land, wetlands, and wetland-associated watersheds
LU2	Support local and regional conservation-based community planning	LU8	Protect large blocks of forest land	H6	Protect and restore critical in-water habitat of lakes and streams
T1	Align transportation planning across all agencies; streamline and integrate environmental transportation project review				
E23	Develop mercury reduction strategies for out-of-state sources				
Rec. No.	Targeted Policy and Action Recommendations	Rec. No.	Targeted Policy and Action Recommendations	Rec. No.	Targeted Policy and Action Recommendations
LU3	Ensure protection of water resources in urban areas	E2	Invest in farm and forest preservation to prevent fragmentation due to development	LU5	Reduce streambank erosion through reduction in peak flows
T3	Develop and implement transportation policies that minimize impacts on natural resources	H3	Improve connectivity and access to recreation	LU6	Reduce upland and gully erosion through soil conservation practices
Rec. No.	Knowledge Infrastructure Recommendations	Rec. No.	Knowledge Infrastructure Recommendations	Rec. No.	Knowledge Infrastructure Recommendations
LU2C	Provide communities with the tools and technical assistance for conservation-based planning	H9	Invest in overall research on land and aquatic habitats	H10	Invest in research on near-shore aquatic habitat vulnerability
E24	Continue state enforcement programs to reduce mercury contamination of the environment	T3A	Develop research programs in habitat fragmentation	H11	Improve understanding of groundwater resources
LU3B	Simplify modeling for TMDLs	LU9	Assess tools for forest land protection	LU5A	Invest in research that quantifies the relationship between artificial drainage and stream flows
LU3C	Monitor TMDL BMP implementation			H12	Improve understanding of watershed responses to multiple drivers of change
LU2D	Invest in databases and tools needed to support land use and conservation decisions			E11	Invest in research and enact policies to protect existing prairies from genetic contamination
LU2A	Fund demonstration projects for conservation-based community planning			LU10E	Develop and test new management policies to test ecosystem resilience
				H13	Encourage conservation education and training programs for all MN citizens
				E12	Invest in efforts to develop sufficient seed stocks for large scale plantings of perennial crops
				LU3D	Expand water quality media campaign

Figure 3. Strategic framework for integrated resource conservation and preservation

Conservation And Preservation

SUSTAINABLE PRACTICES 		ECONOMIC INCENTIVES FOR SUSTAINABILITY 			
Rec. No.	Broad Policy and Action Recommendations				
LU10	Support and expand sustainable practices on working forested lands				
H7	Keep water on the landscape				
H8	Review and analyze drainage policy (ditch laws)				
T2	Reduce per capita vehicle miles of travel				
Rec. No.	Targeted Policy and Action Recommendations	Rec. No.	Targeted Policy and Action Recommendations	Rec. No.	Targeted Policy and Action Recommendations
E13	Invest in research and policies for "green payment" program	E19	Promote policies and strategies to implement smart meter and smart grid technologies	E16	Provide incentives to transition a portion of Minnesota's vehicle fleet to electrical power and renewable electricity production
E17	Promote policies and incentives that encourage C-neutral businesses, homes, communities, and other institutions	E20	Develop incentives to encourage widespread adoption of passive solar and shallow geothermal heat pumps in new construction	E21	Develop standards and incentives for energy capture from municipal sanitary and solid waste, and minimize landfill options
LU4/E4	Transition renewable fuel feedstocks to perennial crops	E15	Invest in efforts to develop community-based energy platforms	E14	Investigate opportunities to provide tax incentives for individual renewable energy investors
E18	Implement policies and incentives to lower energy use of housing stock				
Rec. No.	Knowledge Infrastructure Recommendations	Rec. No.	Knowledge Infrastructure Recommendations	Rec. No.	Knowledge Infrastructure Recommendations
E3	Invest in perennial biofuel crop research and demonstration projects on a landscape scale	E22	Invest in public education focusing on benefits and strategies for energy conservation		
E6	Invest in research to determine removal rates of corn stover and to establish incentives and BMPs	E25	Develop public education on actions that individuals and communities can take to reduce mercury contamination of the environment		
E7	Invest in research to review thermal flow maps	LU7	Invest in statewide high resolution digital elevation data, watershed delineation, maps of artificial drainage network, and other data to support decision making		
E8	Invest in applied research to reduce energy and water consumption and emissions in ethanol plants	LU10B	Educate landowners and forest managers on BMPs to protect working forests		
E9	Invest in research to determine the life cycle impacts of renewable energy production systems				
E10	Invest in research and demonstration projects to develop, and incentives to promote, combination electricity production projects				
T3B	Reduce non-point source pollution to surface and ground waters from transportation infrastructure				
LU4A	Invest in research on parameters that control successful perennial feedstocks				
E5	Invest in data collection to support energy production assessment				

Note: Recommendations having the broadest impact across multiple resources are listed first in each column followed by those having more targeted impact, and supported by knowledge infrastructure recommendations.

The following icons are used throughout the plan to quickly identify recommendations by type:



Integrated Planning Recommendations



Critical Land Protection Recommendations



Land and Water Restoration and Protection Recommendations



Sustainable Practices Recommendations



Economic Incentives for Sustainability

APPENDIX IX

Short Descriptions of Recommendations

Appendix IX Table of Contents

Habitat Recommendations.....	331
Land Use Recommendations.....	339
Transportation Recommendations.....	346
Energy Recommendations.....	349

Habitat Recommendations

Land Protection

Habitat Recommendation 1: Protect priority land habitats



Description of recommended action. The SCPP has identified many critical land habitats throughout the state based on an integrated approach that considers such issues as SGCN, outdoor recreation such as hunting and fishing, protection of water quality, and threats to these resources (Figure H7). Critical land habitats were identified through a combination of existing government, UM, and selected private data sets. These data sets were spatially explicit and, with rare exception, statewide (Table H1). The criteria for critical habitat identification were developed by a group of public and private stakeholders and optimized to provide the most benefit to the most constituents.

These areas have been prioritized for conservation and preservation. A variety of public and private mechanisms are available to protect these areas, including acquisition, conservation easements, and restoration/remediation of impacted habitats. Public education will play an important role in protecting priority land habitats, and coordination among pub-

lic, nonprofit, and private entities to protect critical habitats will be increasingly paramount.

The SCPP outlines important land habitats that benefit wildlife, fish, water quality, and outdoor recreation in the context of threats to these important natural resources. The SCPP allows considerable flexibility for conservation of lands and appropriate protection of economic activity such as logging or other compatible uses. Conservation and protection of these land areas will require multiple mechanisms and a coordinated effort among local, county, regional, state, and national public agencies; nonprofits; and private entities. Of particular importance are rare land features and areas such as native prairie and savanna that have been converted to other land uses. This is among the reasons that SOBS received a relatively high weight in the integrated analysis (Table H1).

The state must further strengthen its leadership to coordinate and stimulate efforts for the protection of these critical land areas among current and potential partners. This activity would include identification of relevant landowners; identification of the most cost-effective measures for protection, restoration, and education on the importance of the area; and development of a comprehensive plan to ensure the economic, environmental, and social benefits of protection.

The integrated mapping analyses provide a basis for and opportunity to develop regionally specific strategies for conservation and preservation of Minnesota's critical habitats, using the suite of policy and incentive options from voluntary implementation of BMPs to permanent land acquisition. Implicit within this recommendation is continued support for ongoing programs such as acquisition of the 54,000 acres of private land within state parks. Acquisition of these lands should remain a high priority because they reduce fragmentation and help to maintain large, intact ecosystems.

Habitat Recommendation 2: Protect critical shorelands of streams and lakes



Description of recommended action. A holistic approach is needed for shoreline protection that integrates acquisition with diverse private-land protection strategies such as conservation tax credits, trading of conservation tax credits, BMPs, shoreland regulations and incentives, zoning ordinances, conservation development, and technical guidance for shoreland owners. Fully funded acquisition programs are essential, but not sufficient to protect large enough areas of shoreland to ensure water quality and habitat protection, and thus sustain healthy lake, river, and stream ecosystems. It is doubly important to protect these aquatic habitats at a large scale to make them more resilient to the significant warming and altered precipitation projected for Minnesota over the next century (Appendix IV). Therefore, the state needs a diversity of economic incentives and other tools for private landowners.

2A. Acquire high-priority shorelands

The highest priority shorelands within each of Minnesota's 22 ecological subsections should be permanently protected through acquisition. This is one essential component of a multistrategy approach to preserving the clean water legacy that Minnesota's citizens and visitors are used to experiencing. Acquisition may protect critical shoreland habitats

from degradation; assure public access for fishing, hunting, wildlife viewing, and natural resource management, which is especially important given the continuing loss of access to natural shores; and provide areas for education and research. Suggestions for prioritizing shoreland acquisition appear in several recent reports, including DNR's 2008 aquatic management area (AMA) acquisition plan, the DNR long-range duck recovery plan, and a 2008 report identifying lake conservation priorities for The Nature Conservancy (TNC).

2B. Protect private shorelands via economic incentives and other tools

Minnesota should greatly increase the use of economic incentives and other tools for private landowners to protect shorelines and other sensitive land along lakes, especially along shallow lakes and shallow bays of deep lakes, and streams and rivers throughout Minnesota. This is also needed for riparian buffers around sinkholes in agricultural lands in southeastern Minnesota (see further discussion under habitat recommendation 7).

Protection of private shorelands should combine various tools, such as tax credits, conservation easements for shoreland protection and restoration, BMPs, technical guidance to shoreland owners, shoreland regulations, and zoning ordinances. It is especially important to scale up and combine these tools, for example, by providing technical guidance to landowners on how to implement BMPs on shorelands put under a tradeable conservation tax credit.

Tax credits could dramatically catalyze private shoreland protection. The idea is to provide state income tax credit for conservation easements. In their simplest form, conservation tax credits are applied to perpetual conservation easements or donations of fee-title land. Perpetual conservation easements could be donated to the state or legal land trusts. A further innovation is to allow trade of conservation tax credits among taxpayers: Landowners with

low state tax liability could sell their credits to landowners with higher tax liability, thereby giving landowners with low tax liability an incentive to become interested in making land conservation donations. Although conservation tax credits were initially conceived as a protection strategy for shallow lake habitats in agricultural areas, this approach could expand to protecting a broader array of shorelands (streams, rivers, lakes, wetlands) throughout the state.

Habitat Recommendation 3: Improve connectivity and access to outdoor recreation



Outdoor recreation was not one of the three focal issues chosen for the final SCPP; however, the State Comprehensive Outdoor Recreation Plan (SCORP) has already provided a comprehensive plan and the SCPP preliminary plan provided recommendations for research to support quality outdoor recreation in the future (see Appendix I). To complement these recommendations, the habitat team offers an additional recommendation regarding the important connection between habitat conservation and recreation and considering the distribution of historical and cultural resources in the state.

Description of recommended action. Land use patterns are changing in Minnesota. Lakeshore development is increasing, urban areas are expanding, and forests are being divided into small, privately owned parcels. These changes and others are affecting outdoor recreation. Land needs to be acquired, protected, and restored to provide Minnesotans and visitors an outdoor system where they can recreate.

Action should be taken to improve connectivity of and access to outdoor recreation areas (parks, natural areas, wildlife management areas, etc., Figure H30) and document the connectivity and experience opportunities through a statewide recreation system. Such connectivity would require enhancing connections among state, federal, and local government lands and facilities. Prioritization for acquisition,

protection, and restoration of the natural resource base that supports outdoor recreation should focus on large, contiguous land areas suitable for: natural resource-based outdoor recreation; shorelands; threatened habitat areas with opportunities to improve connectivity of underserved areas; and rapidly growing areas or areas where land use changes may limit future outdoor recreation opportunities.

The trends in recreational use and changes in land use patterns all support this recommendation. These primary drivers include land use conversion patterns and changes in population demographics in areas such as the Twin Cities metropolitan area and locations with lakes, rivers, and forests. Participation in hunting and fishing continues to decline, while non-consumptive activities such as wildlife watching and hiking remain stable or are growing. Increasing human population is projected to lead to an estimated rise in state park visitors, from 8.6 million in 1998 to 9.2 million by 2025. If energy costs continue to increase, there will be a growing demand for outdoor opportunities that limit the need to travel great distances for recreation.

Habitat Recommendation 4: Restore and protect shallow lakes



Description of recommended action. Minnesota should accelerate efforts to restore and improve shallow-lake habitat (including shallow bays of deep lakes) in priority watersheds in order to reduce the number of lakes in a turbid-water state, and to restore some of the 1,000-plus drained shallow lakes in the state. Active management of Swan, Christina, and Thief Lakes shows that many shallow lakes with poor water quality and little habitat can be restored through active management.

Sensitive shallow lakes frequently winterkill (fish); are subject to mixing from wind, surface use, and large fish (carp); and typically exist in either a turbid- or clear-water state. Unfortunately, most shallow lakes in the prairie and forest-prairie transi-

tion zones of Minnesota are in the turbid-water state. This is due to the combination of increased flows of water and nutrients into them from intensively drained and cultivated landscapes that surround them, and abundant populations of invasive fish (e.g., carp and black bullhead) that result from increased connectivity (i.e., ditches) and persist due to lack of natural winterkill. Some shallow lakes are so turbid that they are listed as impaired by the MPCA. Dense human housing development and inappropriate surface uses are also increasing threats to shallow lakes.

Funding is needed to purchase conservation easements around shallow lakes to restore their lake-sheds (small wetlands and grass buffers) and prevent development. Funding is also needed to install fish barriers to keep out invasive species such as carp. Finally, funding is needed for water control structures that state agency managers can use to conduct temporary drawdowns to consolidate and aerate sediments, induce natural winterkill of fish, and rejuvenate aquatic plants. The level of development and management of the landscapes around shallow lakes necessitates active in-lake management in order to maintain water quality and good habitat.

Habitat Recommendation 5: Restore land, wetlands, and wetland-associated watersheds



Description of recommended action. Minnesota must invest in prioritized areas to restore degraded and rare land features, wetlands (especially many that have been drained and converted), and watersheds associated with wetlands. This will provide benefits for wildlife, SGCN, water quality, and important ecological processes. This is especially imperative in the prairie and prairie-forest transition zones of the state. Restoration should consider the need to encourage landowners to restore these lands and compensate them above and beyond the fair market value of the land, since most sites are not for sale and high crop prices inhibit conversion of land

from agriculture to other uses. Consideration must also be given to using easements on private lands to achieve habitat restoration goals. It is imperative to recognize the huge loss of native prairie and small wetlands in the prairie region of Minnesota (99% and 90%, respectively). Wildlife does not require restored lands to be in public ownership to benefit from them as critical habitat. Restoration, however, is not only needed in the prairie regions, though it is of high priority there. Other land uses such as savanna and forests are also in need of attention. For instance, riparian forests need restoring, and regeneration of oak, white cedar, and white pine requires attention. Similarly, restoration of wetlands alone cannot restore their appropriate structure and function; restoration efforts must also consider the watersheds that drain into wetlands.

Habitat Recommendation 6: Protect and restore critical in-water habitat of lakes and streams



Description of recommended action. Accelerate and expand the relatively small current efforts to restore critical habitat for aquatic communities in near-shore areas of lakes, in-stream areas of rivers and streams, and deep-water lakes with exceptional water quality.

6A. Restore habitat structure within lakes

We recommend developing a program to restore the natural features of lakeshore habitats (shoreland, shoreline, and near-shore areas). The program would add woody habitat where it has been removed, and restore emergent and floating vegetation where it has been lost. The program would also work with lake-home owners and lake associations to achieve restoration goals.

Increasing development pressure along lakeshores has negative impacts on these species and water quality—and Minnesota's lakeshores are being developed at a rapid rate. The shallow areas in large lakes are crucial to fish, wildlife, and water quality.

An estimated 20% to 28% of the near-shore emergent and floating-leaf coverage has been lost due to development in bass and walleye lakes. On average, there is a 66% reduction in aquatic vegetation coverage with shoreland development. These declines in aquatic vegetation coincide with lower fish production and reduced water quality in lakes. Woody habitat losses are also occurring in Minnesota lakes but have not been quantified. Many fish depend on aquatic vegetation, woody habitat, and shorelines to provide spawning habitat, cover, and refuge from predators. Downed trees provide important in-lake structure, habitat, food, and shelter for fishes, frogs, turtles, water birds, and mammals. This woody habitat is also important for aquatic invertebrates such as snails and bryozoans. Turtles need to bask on dead-falls or floating logs. Near-shore downed trees also blunt waves and ice action that scour the lake bed. Because trees often grow slowly and their density has been reduced due to past shoreline alterations, this important habitat element in Minnesota lakes may not be replenished without substantial efforts.

6B. Protect and restore in-stream habitats

A priority for rivers, particularly the Mississippi River, is to reduce the negative effects of recreational boat traffic, especially from medium to large cruisers, on sensitive shoreline habitats. Stream-bank erosion from recreational boat wakes adds large sediment loads, which increases water turbidity and disrupts the growth of beneficial aquatic plants and reproduction of native mussels and some fish. Other habitat impacts include breakage of aquatic plants; impingement and various disturbances of fish and wildlife; and dislodging of woody debris that normally provides important cover and food production for fish, as well as habitat structure for turtles and birds. Systemic solutions include enforcing no-wake zones or no-wake periods in sensitive habitats, which requires revision of local, state, or federal surface water use regulations; and design of more river-friendly boats, which requires engineering research and development. Past education efforts and voluntary no-wake zones have not worked.

A priority for former prairie zones of Minnesota is to reverse the negative effects of stream channelization on in-stream habitats for fish and other aquatic organisms. Channelization has changed the hydrology of streams, which has then made them wider and more deeply incised. In many locations, negative effects of stream channelization have been exacerbated by removal of riparian vegetation and wetlands, and altered upland land use. Several approaches can be implemented to protect and restore in-stream habitats. Riparian vegetation can be restored to stabilize stream banks (several state and federal programs, such as RIM, CRP, CREP and CSP, can provide financial assistance). Two-stage channels (Figures H33 and H34) can be constructed where streams have been channelized to provide a flood plain to dissipate stream energy and allow the channel to remeander, which will provide more diverse habitat for aquatic organisms. Restoring wetlands and altering upland vegetation (state and federal programs provide financial assistance) will hold water on the landscape or allow for increased infiltration, both of which can help mitigate the altered hydrology of streams.

Minnesota has hundreds of low-head dams and culverts that restrict movement of aquatic organisms. Inappropriately sized culverts also may contribute to localized flooding. Removal of dams and installing culverts with increased capacity would improve connectivity of aquatic systems. An alternative approach to removal of low-head dams is to provide for fish passage through the dam (e.g., recent construction providing passage for lake sturgeon in the Wild Rice River). Opportunities to remove higher dams or alter them to provide fish passage should also be explored.

6C. Protect deep-water lakes with exceptional water quality

Clear lakes with large, oxygen-rich deep-water zones provide critical habitat for native cold-water fish such as cisco, lake whitefish, and lake trout in

Minnesota. In the summer, lakes stratify into three layers; an uppermost epilimnion, which is warmest and oxygen poor; a middle thermocline; and the lowest hypolimnion, which is coldest and oxygen rich. During warm summers, cold-water fish find refuge in the cold hypolimnion if it has sufficient oxygen. Only lakes with the most exceptional water quality maintain enough oxygen in the hypolimnion for cold-water fish to thrive. Climate warming and poor land use in Minnesota pose imminent threats to oxygen levels in these deep-water zones. First, increased duration of stratification from climate warming decreases their oxygen content late in the summer. Second, oxygen concentrations are reduced by poor land use when decaying organic matter from algae and plants, stimulated by high nutrient loading, consumes oxygen in deep water. Both of these threats have the potential to severely limit habitat for cold-water fish in Minnesota.

Deep lakes with exceptional water quality will represent important sanctuaries for cold-water fish as the climate warms in Minnesota. However, future deterioration of water quality would greatly jeopardize the ability of these lakes to provide that refuge. These potential refuge lakes are being identified by the DNR and the UM. Many of these lakes are the “crown jewels” of Minnesota and deserve special status in addition to their value as refuges from climate change. Examples include Ten Mile Lake in Cass County, Big Trout Lake in Crow Wing County, Big Sand Lake in Hubbard County, and Trout and Wabana Lakes in Itasca County. Also, these types of lakes are not completely limited to forested ecoregions. Big Watab Lake, located in agricultural Stearns County, and Square Lake, located in the Twin Cities metropolitan area, also represent lakes with excellent oxygen resources in the hypolimnion.

Once identified, lake watershed protection efforts should be initiated with a special commitment. These protection efforts could include land purchase, easement protection, and BMP implementation. Many are already “high-profile” lakes with ac-

tive and dedicated lake associations and local users. Implementation of high-intensity watershed and shoreland protection efforts would largely be welcomed. Protection of these lakes may actually be cost effective (high value for modest investment). Many are characterized by small, forested watersheds and protection efforts can be targeted at relatively few parcels with great cost efficiency.

Sustainable Practice

Habitat Recommendation 7: Keep water on the landscape



Description of recommended action. Retaining water on the landscape over broader areas and for longer periods is critical for improving water quality, reducing flooding, maintaining habitat for wildlife and game species, and enhancing biological diversity. The intent of this recommendation is to have water move more slowly across and through the landscape to return to more natural conditions. This need is acute in agricultural and urban landscapes of Minnesota. We suggest three strategies that complement other landscape-focused recommendations in this plan:

- Perennial vegetation
- Storm water controls
- Riparian buffers

Habitat Recommendation 8: Review and analyze drainage policy



Description of recommended action. The state should invest in a comprehensive review and analysis of laws relating to drainage, including Minnesota Statutes Chapter 103E, and recommend changes to the legislature that would remove barriers and facilitate the restoration of critical wetlands in order to improve water quality and aquatic habitats.

Knowledge Infrastructure

Habitat Recommendation 9: Overall research on land and aquatic habitats



Description of recommended action. The SCPP has developed and implemented a mechanism to integrate a portfolio of spatial data layers summarizing important natural resources and environmental threats in Minnesota. These data layers quantify the loss of native biodiversity, distribution of important outdoor resources (e.g., fish and wildlife populations), impairments to aquatic resources, degradation of critical ecological processes (e.g., nutrient cycling, predator-prey interactions), and locations of biologically significant and large, intact natural ecosystems. The spatial data layers were also examined in relation to where housing development was most likely to occur in the future, locations of road networks, current and future agricultural-bioenergy activity, and land ownership (Figures H2–H16).

Research is essential to improve understanding of the risk of extinction of Minnesota’s native biological diversity; continuing availability of quality outdoor recreation; and confidence in the ability to protect aquatic resources in the face of risks such as climate change, invasive species, and expanding human population. Information on important historical and cultural resources should also be researched and incorporated into decision making on conservation, protection, or restoration efforts.

The state of Minnesota should continue to appropriate funds for improving understanding of fish and wildlife populations, native biological diversity, and water quality, and mitigating the stressors that affect them.

Habitat Recommendation 10: Research on near-shore habitat vulnerability



Description of recommended action. There is a need to increase understanding of near-shore habitat vulnerability. This would be best accomplished through research on the human behaviors that degrade and destroy near-shore habitat, as well as pilot policies or programs that preserve or restore near-shore fish and wildlife habitat. Research can also address historic and cultural resources associated with near-shore habitat.

Habitat Recommendation 11: Improve understanding of ground water resources



Description of recommended action. Ground water is an indispensable natural resource for human activities and human health. Partly because ground water is a hidden resource, Minnesota has not yet adequately answered critical questions about it. We need to understand how much ground water we have, where we can find it, its quality, how it moves, where it is recharged, where it discharges, and how much we can safely tap, both seasonally and long term.

The state needs to make a major, sustained investment in the collection and assessment of information about ground water and its connection to surface waters. We need to fill information gaps at the site-specific scale and the scale of entire hydrologic systems, including aquifers and watersheds. Given the relatively complex hydrology in our state, Minnesota may be decades away from acquiring sufficient information to inform site-specific decisions about ground-water usage throughout the state. Filling critical information gaps at both scales is essential for achieving sustainable management of ground water that meets the needs of humans and habitats.

The overall goal of this recommendation is to develop a large-scale, hydrologic-system framework for understanding how today’s decisions may affect

tomorrow's needs. This systems approach will offer insights into the more strategic questions that are beyond the reach of the current site-by-site focus of decision-making for ground-water use. A systems approach will make it possible to answer questions about (1) how much water can be committed to human activities without adversely affecting ecosystems, (2) how much growth a specific region can sustain based upon its water budget, and (3) how land use changes and climate change may shift the whole equation.

Habitat Recommendation 12: Improve understanding of watersheds' response to multiple drivers of change



Description of recommended action. Effective water quality protection and restoration will require additional monitoring, research, and evaluation of aquatic and land responses to land use, climate, and other changes. While much is known within various spatial and temporal scales, interactions and responses across scales are not well understood. Research is needed to build the capacity of resource managers to understand and evaluate the multitude of factors that affect these resources across the state.

To accomplish this recommendation, investment is needed for research across many watershed scales to improve understanding of pollutants, pollution sources, movement across the watershed (e.g., hydrology), and physical, chemical, and biological responses. There have been significant advances in monitoring methods and technologies, plus increased funding (e.g., through the Clean Water Legacy Act). The use of biological monitoring has become better integrated with water quality. The next step to achieve a better understanding of watershed systems and an assessment of their health is to gain a more holistic and comprehensive understanding of how a water body and its watershed function. This would result in more effective protection, restoration, and conservation for both land and aquatic habitats.

A formal physical watershed evaluation monitoring effort is also needed to assess habitat and underlying geomorphic conditions as a component of Clean Water Legacy monitoring and assessment activities. Greater use of geographic information system (GIS) data layers and analysis tools is essential as data layers become more detailed and analytical techniques improve. The DNR Watershed Assessment Tool should be improved to enable the identification of priority habitat investment areas. Use of tools such as the U.S. Environmental Protection Agency (USEPA) Watershed Assessment of River Stability and Sediment Supply (WARSSS) procedures should be supported for developing and completing physical channel, bank, and watershed condition monitoring and evaluation.

The state lacks the basic information needed to understand how multiple drivers of change affect Minnesota's watersheds. The state should conduct a rapid assessment to gather baseline information on the physical, biological, and chemical conditions of streams important to understanding these effects.

Attention is also needed in the evaluation of the potential impacts of climate change on land and aquatic habitats. State-level studies are needed to improve projections of how climate change will alter habitats, the distributions of species, and the stressors that affect both. Studies are also needed to inform strategies that will support adaptation of biodiversity to a changed climate (see Appendix IV).

Habitat Recommendation 13: Habitat and landscape conservation and training programs for all citizens



Description of recommended action. The state should invest in education to improve public understanding of the need for better conservation, protection, and restoration of Minnesota's habitats and landscapes. Expanded education, information, and training efforts are needed to bring focus to the complexity of land, water, and land-water interactions in

a landscape context. These efforts must be directed to all citizens from K–12 educational levels to higher education, and the general public. A broad range of teaching and information sharing materials has been developed. Means of delivering the materials, goals for communicating them, and ways to measure success need yet to be developed.

As people have migrated to cities over the past 50 years, awareness of natural resources has declined. To attain a more informed constituency, whether as interested citizens or as professionals doing natural resources work, investment is needed. Technical information and transfer of that information is needed for people to grow an awareness of natural resources, and appreciation for monitoring, assessment, and data evaluation.

Land Use Recommendations

Community Land Use

Land Use Recommendation 1: Fund and implement a state land use, development, and investment guide



Description of recommended action. The state spends billions of dollars each year on infrastructure, local government and business assistance, and regulation in order to safeguard the environment, help business and communities thrive, and improve the quality of life in Minnesota. However, there is no system or guide in place to provide an overview of how these funds are spent across agencies, to track how these dollars come together on the land and in communities, and to determine whether investments in one sector put those in another at risk.

In addition, while most land use decisions are made at the local level, state-level vision and leadership are needed on many natural resource issues. The state

needs to clearly define its interests and use its resources to engage others in securing those interests for the long term. Therefore the preparation and implementation of a state land use, development, and investment guide should be funded. The guide would provide a way to define, quantify, and unify state goals and investment objectives across social, economic and environmental sectors. It would offer the opportunity to reconcile conflicting goals and preserve Minnesota’s natural resources. This is more important than ever, given the intense competition for land and resources and the chronic scarcity of state funds coupled with the uncertainties introduced by climate change.

Land Use Recommendation 2: Support local and regional conservation-based community planning



Description of recommended action. The objective of this recommendation is to promote land use planning that advances the permanent protection and restoration of Minnesota’s natural resources, important agricultural areas, and open space by supporting conservation-based planning in local and regional communities. The recommendation contains four elements:

- Demonstration (pilot projects)
- Incentives
- Tools and technical assistance
- Investment in base data

This strategy builds on the broader vision, goals, and criteria established under land use recommendation 1—the state land use, development, and investment guide—and refines it for local and regional use. Local governments and conservation organizations can be key agents in implementing the SCPP and local stewardship significantly expands the state’s capacity to protect and restore natural areas. Supporting local and regional communities in conservation-based planning will help communities establish long-term goals that are consistent with the state’s goals, and allow communities to implement those goals as development occurs.

In order to support conservation-based planning in local and regional communities, four elements are needed: Demonstration, incentives, tools and technical assistance, and base data. The following subrecommendations describe each of these elements.

2A. Demonstrate conservation-based planning through pilot projects

Pilot projects that embody all the elements of good conservation-based planning, as outlined above, would help create an understanding among local and regional communities of the processes involved, identify barriers, and demonstrate benefits. The projects would also generate feedback on adapting strategies for optimal function and effect. Different approaches may be appropriate in different parts of the state, depending on the issues of concern to a particular community or region. Therefore, funding for three types of pilot projects is recommended.

- Conservation-based planning in a variety of local communities
- Conservation-based planning along a rapidly developing transportation corridor (involving multiple communities)
- Conservation-based planning resulting in an AUAR-certified comprehensive plan

2B. Provide incentives to local governments and conservation organizations for conservation-based planning

Recent trends in decreasing federal and state natural area grant programs and decreases in general state aid to local governments have undermined local planning and stewardship capacity, even as growth pressures on natural resources have increased. Financial incentives are needed to engage local partners in planning and implementation that meets local and statewide conservation goals.

- Provide financial assistance to communities to undertake conservation-based planning

- Provide financial assistance to communities to support implementation of conservation-based plans

2C. Provide tools and technical assistance for conservation-based planning

To develop conservation-based plans, communities must have access to appropriate tools and technical assistance. These include:

- Carbon calculator for communities
- Improve agricultural land preservation tools
- Develop and deliver outreach materials
- Establish a Minnesota natural resources and development partnership
- Invest in building state assistance capabilities

2D. Invest in generating base data and information necessary to support conservation-based planning

Accurate information about the type and quality of natural resources is essential for making sound planning decisions. Improved planning that uses land cover and other types of natural resources information can identify areas in need of restoration, areas for protection, areas for landscape connectivity, and areas more suitable to development that minimize or avoid environmental degradation and loss. Nearly all of these proposed land use recommendations require accurate, reliable, and standardized information about the type, location, and quality of existing resources as well as an understanding of general land cover type. However, this information is currently severely lacking in the majority of the state, particularly in critical areas.

- Develop appropriate MLCCS data in areas vulnerable to near-term development or conversion of land cover
- Update statewide land-cover databases and remote sensing capabilities

Land Use Recommendation 3: Ensure protection of water resources in urban areas by evaluating and improving current programs



Description of recommended action. Changes to surface water runoff due to new development and redevelopment have significant impacts on most of the major drivers of change of Minnesota's natural resources. The state of Minnesota has a set of powerful surface water regulatory programs that are largely directed at controlling land use change and development practices to improve and protect water quality. These programs are supported and driven by federal and state statutes and rules, and include:

- Impaired waters and Total Maximum Daily Loads (TMDLs)
- National Pollutant Discharge Elimination System (NPDES) storm-water permitting
 - + Municipal separate storm sewer systems (MS4)
 - + Construction sites
 - + Industrial sites
- Nondegradation for all waters
- Shoreland management

3A. Credit system for storm-water and LID BMPs

For a limited number of storm-water BMPs, such as storm-water National Urban Runoff Program (NURP) ponds, a strong system of credits is integrated into the storm-water regulatory framework at multiple levels. This system of credits needs to be extended to a much wider range of BMPs, including low-impact development (LID) practices, conservation design, and nonstructural BMPs.

NURP developed a system that was very effective in supporting the design and installation of storm-water ponds.

The result of this effort was the universal adoption and acceptance of storm-water ponds across all sectors. Designers working on projects could use the

design guidelines to include storm-water ponds in their projects in order to meet permit and design standards from multiple reviewing and approving government entities.

This system needs to be extended to a wide range of relatively new BMPs. Many of the design standards are currently incorporated into the Minnesota Stormwater Manual. What is missing is a credit system for implementing the BMPs. A well-defined and strongly-supported credit system is needed to motivate developers, builders, and local government units (LGUs) to include these practices in their projects.

This credit system must apply to multiple levels of the landscape. In a manner similar to NURP ponds, the credit system should apply to individual sites and construction projects. The credit system should also function at the regional and statewide levels. The Lake Pepin TMDL, for example, will probably call for a significant phosphorus reduction across the 60% of the lake's watershed in Minnesota. An effective credit system should function at this level to enable cities to determine whether their storm-water BMP programs are sufficient to meet the waste load allocation from the TMDL.

3B. Simple modeling protocols for TMDL compliance

TMDL studies produce waste-load allocations and load allocations for pollutants. These allocations result in a responsibility for implementation of restoration measures by cities, other LGUs, and other landowners. In the case of municipal wastewater treatment plants and cities covered under the NPDES MS4 storm-water program, these responsibilities take the form of permit requirements.

This simple modeling system would consist of a load estimating model based on land use and loading rates combined with a total load reduction model based on load removal rates and volume reduction rates appropriate for a wide range of BMP systems. This simple model could be used by all cities

and other landowners with relatively low technical knowledge and manageable input requirements.

3C. TMDL BMP implementation monitoring

Draft and implement a program of detailed BMP monitoring in selected representative watersheds with TMDL studies and implementation plans. In addition to monitoring the water body itself, this program would involve monitoring throughout the watershed to determine the effectiveness of BMP systems implemented by various entities and types of entities (agriculture, silviculture, cities, storm-water, wastewater, etc). It would also involve detailed in-stream or in-lake monitoring to better understand processes in the water bodies themselves, as well as contributions from the landscape and municipal infrastructure.

This monitoring program may include some BMP implementation monitoring – simply counting and documenting the extent of the implementation of BMP systems across the landscape. The main focus, though, will be water-quality monitoring to directly measure the impact and effectiveness of BMPs by measuring water-quality parameters at discharge points and in water bodies near or adjacent to the BMP systems.

This scale of monitoring would provide an important accountability framework for all parties involved in implementing BMPs and meeting water-quality standards (cities, watershed organizations, agriculture, etc.). This type of monitoring program has also been referred to as “sentinel watershed” or “representative watershed” monitoring.

The equipment to perform this monitoring, if purchased using state funds, should be owned by the state. This will significantly expand the state’s monitoring capacity.

3D. Water quality media campaign

Further develop and expand the reach of Minnesota Water—Let’s Keep It Clean!, a storm-water pollution prevention campaign produced by a coalition of cities, nonprofits, agencies, watersheds, and others working to develop pollution prevention resources for the Twin Cities metropolitan area.

This campaign is designed to enhance public education and awareness of storm-water pollution prevention strategies by disseminating messages in mass media and providing educational materials for educators and municipal staff through the www.cleanwatermn.org Web site.

Agricultural Land Use

Land Use Recommendation 4: As much as possible, transition renewable fuel feedstocks to perennial crops



Perennial species protect the soil from erosion throughout the year and reduce the volume of early-season water runoff (related to stream-bank erosion) because of a longer annual duration of evapotranspiration and increased infiltration. Additionally, the use of perennial cellulosic crops as feedstock for biofuels can significantly reduce life-cycle GHG emissions relative to grain-based ethanol production systems. Because an appropriate selection of perennials is less sensitive to risks such as temporary flooding and drought, and presents less risk of erosion and nutrient runoff, it can complement annual food and feed crops by occupying the more vulnerable land areas, stabilizing incomes and protecting the environment.

Conservation and protection of water quality and soils are strongly influenced by land cover. Perennial species protect the soil from erosion throughout the year and reduce the volume of water runoff (related to stream-bank erosion) because of a longer annual duration of evapotranspiration and increased infiltration. Additionally, the use of perennial crops as

feedstock for biofuels can significantly reduce life-cycle GHG emissions relative to grain-based ethanol production systems.

4A. Invest in research on parameters that control successful perennial feedstocks

Description of recommended action. Invest in research to determine ecoregion and site-specific suitability and management of perennial species for use as feedstock for biofuels and other products. Minnesota agro-ecoregions (Figure L9) differ significantly in suitability for perennial species that can serve as feedstocks for biofuels and other products. Growing season length and temperature, precipitation, and soil characteristics are important determinants of species suitability. Research is necessary to help producers select site-specific perennial species for use as cellulosic feedstocks.

4B. Investigate policy changes on fuel feedstock transition

Description of recommended action. Investigate, analyze, and adopt policy that will gradually transition biofuel feedstocks produced for the Minnesota ethanol mandate to perennial crops. The transition should be matched to availability of processing technology and requirements for infrastructure development.

Land Use Recommendation 5: Reduce stream-bank erosion through reductions in peak flows



Reductions in peak and total flows by modification of drainage systems, and constructing and restoring wetlands and riparian areas in strategic locations, will reduce attendant stream-bank and near-channel erosion, a major source of sediment in the Minnesota River basin. While agricultural drainage is necessary, research-based modifications such as shallower tile placement can reduce downstream impacts. With placement guided by more accurate digi-

tal elevation data, strategically located water storage would lessen the impact of both surface and subsurface drainage systems on stream channels and reduce nutrients in water. Some water storage areas could be occupied by biomass crops not sensitive to temporary flooding.

5A. Invest in research that quantifies the relationship between artificial drainage and stream flows

Description of recommended action. Invest in research to determine the quantitative relationship among trends in precipitation, artificial drainage systems, and stream hydrology.

Determination of the quantitative relationship among trends in precipitation, artificial drainage systems, land cover, and stream hydrology would allow more precise targeting of mitigation strategies, since the relationships are complex and strategies will be site specific.

5B. Investigate policy changes for goals for peak flow reductions

Description of recommended action. Set research-based goals for peak-flow reductions through hydrologic detention, wetland and riparian zone restoration, and other measures.

5C. Invest in targeted water detention

Description of recommended action. Invest in strategically targeted programs for reduction of peak flows through increased water detention in agricultural drainage systems, including wetland construction and restoration, in-ditch storage, and conservation drainage.

Targeted drainage water detention will reduce peak flows and attendant stream-bank erosion. It will also reduce sediment and nutrient contributions from uplands through sediment deposition and denitrification. Hydrologic detention measures should

complement programs and policies to reduce flows through more perennial crops and buffers.

5D. Investigate policy changes for peak flow reduction

Description of recommended action. Investigate, analyze, and adopt science-based policy that strengthens mitigation of peak flows from artificial drainage systems.

Land Use Recommendation 6: Reduce upland and gully erosion through soil conservation practices



Education, targeted incentives, and practice-flexible, outcome-based soil and water conservation plans where needed would reduce soil erosion from fields and areas of concentrated flows. The result would be reduced sediment and phosphorus delivery to water and protection of soil productivity. Certified crop consultants already deliver conservation-related services (nutrient and pest management) and can provide other field-based services in support of soil conservation to augment services provided by the USDA, NRCS and Soil and Water Conservation Districts (SWCDs).

Soil erosion from sloping fields, especially those near unbuffered streams, is a significant source of sediment and associated phosphorus. Current federal Farm Bill and energy policies and incentives are increasing row-crop production (Figure L8), especially on the sloping soils of southeastern Minnesota, where a high proportion of land has been in pasture and perennial crops. The increased width of tillage, planting, and spraying implements makes maintenance of erosion-control structures such as terraces and grassed waterways more difficult and less likely. The increased prevalence of corn following corn for ethanol production increases the prevalence of intense tillage to reduce crop-residue effects on corn early growth and yields. The percentage of cropland operated by renters, many of them with short-term leases and cash rents, exceeds 40% (2002 Census

of Agriculture), lessening the incentive for long-term soil stewardship. Reductions in upland and gully erosion will require stronger incentives and standards for soil conservation if the trends above continue.

6A. Invest in soil conservation practices

Description of recommended action. Invest in education and incentive programs, leveraging federal, state, and local resources when possible, that target landowners in critical sediment source areas.

Landscape areas differ in potential to deliver sediment and nutrients to water, based on proximity, slope, and other factors. Education and incentive programs that target high-contributing areas will achieve more mitigation per dollar invested than nontargeted programs (Figure L5).

6B. Investigate policy changes to reduce upland and gully erosion

Description of recommended action. Investigate the feasibility of developing or amending policy, such as water quality rules, to phase in outcome-driven, practice-flexible soil and water conservation plans for all farms with potential to deliver sediment and nutrients to water bodies. The phase-in priority could begin with farms in watersheds with sediment and phosphorus-related impairments.

Land Use Recommendation 7: Enable improved design and targeting of conservation through improved and timely data collection and distribution



Determination of sediment source areas, targeting of conservation practices, determination of effectiveness of practices, and installation of conservation structures all require adequate resource data. These include high-resolution digital elevation data, land cover, crop residue coverage, and conservation practice effectiveness monitoring.

7A. Invest in data collection

Description of recommended action. Invest in the following basic information to support soil and water protection:

- Statewide high-resolution digital elevation data (LIDAR) and associated high-resolution watershed delineation
- Statewide updated land-cover data
- Maps of the artificial drainage network
- A long-term program monitoring the effectiveness of BMPs on critical source areas
- An annual crop residue survey (following planting) of sloping lands near streams
- A periodic detailed survey of benchmark sampling sites to determine trends in soil erosion, as was carried out previously by the NRCS for the National Resources Inventory
- Periodic remote sensing by aircraft and/or satellite for land cover and other attributes

Forestry Land Use

Land Use Recommendation 8: Protect large blocks of forested land



Description of recommended action. The objective of this recommendation is to identify, prioritize, and promote protection of large blocks of forested land, focused on areas that are adjacent to large publicly held blocks and that are at risk of parcelization, conversion, and fragmentation.

8A. Identify forestlands for protection

Research is needed to indicate the location and characteristics of land that should be targeted for protection. Specifically, research is needed to:

- Provide a detailed map of land parcelization trends in Minnesota
- Identify targeted blocks of threatened land near large blocks of publicly held land

8B. Prioritize forest lands for protection

Prioritization should be based on proximity to large blocks of already protected land (both public and private) to maximize the resiliency of the forests, and should include a specific focus on protecting working forests so that forest products can continue to support regional economies of Minnesota. Protection should focus on at-risk and high-priority lands (generally 100 acres or more) in both the Laurentian mixed forests and eastern broadleaf forests.

8C. Support and promote permanent protection of forest lands

Permanent protection of forestlands through fee title acquisition or conservation easements will need to be supported and promoted to landowners through financial incentives, education, and technical assistance.

Land Use Recommendation 9: Assess tools for forest land protection



Description of recommended action. This recommendation is focused on identifying, examining, and monitoring the impacts of diverse tools in order to assess their effectiveness for forest land protection.

The state can make a spectrum of investments to protect forestland. Some directly support permanent protection of forestland, such as fee title acquisitions, conservation easements, and tax policies. Others, such as cost share, forest certification, and forest stewardship planning, support forestland protection indirectly by supporting sustainable management practices.

Each tool has a role in protecting Minnesota's forests, and the choice of tools depends on many factors, including site-specific conditions and cost effectiveness. Protection tools have been successful in protecting critical forest lands in Minnesota, but a comprehensive assessment of their appropriateness in various settings is lacking.

Land Use Recommendation 10: Support and expand sustainable practices on working forested lands



Description of recommended action. The objective of this recommendation is to promote and implement sustainable forest practices in working forests in Minnesota. This strategy builds on the accomplishments of the MFRC voluntary guidelines. Strategies include education, financial incentives to landowners, research and demonstration, and direct investment in specific management strategies.

10A. Educate consumers on benefits of certified wood to increase the demand for sustainably raised timber in Minnesota

10B. Educate landowners and forest managers on best management practices to protect working forests

10C. Promote collective/cooperative management of forestlands at a landscape level in order to increase the multiple benefits of forests (timber, air quality, carbon sinks, water quality, etc.)

10D. Provide incentives for sustainable forestry practices

10E. Develop and test new management practices to improve ecosystem resilience

Invest in research and demonstration areas that identify, examine, and monitor the impact of management scenarios on ecosystem resilience and increase understanding of the impact of climate change and other key drivers on forested ecosystems.

10F. Support the use of fire to increase forest health and biodiversity

Use of fire is supported by management strategies currently being developed by DNR for newly updated Ecological Classification System (ECS) plant community classifications.

Transportation Recommendations

Transportation Recommendation 1:

Align transportation planning across state agencies and integrate development and review across state, regional, metropolitan and county/local transportation, land use and conservation programs



1A. Institute interagency alignment of planning to coordinate transportation with other state planning cycles

The state should coordinate cyclical statewide plans across state agencies (e.g., MnDOT, Minnesota Pollution Control Agency [MPCA], DNR) and provide environmental data coordination and analysis, including determination of vulnerable ecological areas by resource, cumulative impact analysis and projection, performance standards and best practices research, and recommendations for land acquisition. MnDOT would continue to have the role of responsible governing unit (RGU) for surface transportation projects.

If implemented, integration would provide incentive for feedback systems through monitoring and strategic research programs, organize and align early review of projects, and promote nonstructural and structural practices and performance measures.

1B. Integrate streamlined statewide environmental transportation project review with other statewide and cross-jurisdictional planning, design, budgeting, and review programs

Adopt environmental interagency stakeholder involvement (streamlining) project planning protocols through coordination across state, metropolitan, and county/local transportation, land use, and conservation decision-making responsibilities.

Modify the highway project development process (HPDP) to create a cross-consultative regional

and local forum and an environmental team to lead federal- and state-mandated impact assessment. MnDOT and the EQB would create the forum and teams with participation of other review agencies, including MPCA, DNR, the Minnesota State Historic Preservation Office (SHPO), and metropolitan and county units.

Description of recommended action. A coordinated statewide interagency planning process around transportation and other statewide initiatives will enhance efficiencies and coherence of funding and other efforts with resource conservation objectives.

Once a project is approved in the annual review process associated with the STIP, the purpose and need statements that formed their environmental assessment parameters will have been set. Since these projects have already been prioritized at the MnDOT district level through the regional ATP using the STIP projection of costs of minimization/mitigation, they would be potential candidates for streamlined environmental review. When streamlined environmental assessment occurs, EQB and MnDOT (and in the cases of transit corridors, the Metropolitan Council and/or the counties that are the joint RGUs for the project) are responsible to align all interagency environmental processes and to set and coordinate project performance standards and best practices and develop monitoring. This process will have local coordination based on analysis and cross-consultation via a new ETAT process.

**Transportation Recommendation 2:
Reduce per capita vehicle miles of travel (VMT), through compact mixed-use development and multi- and intermodal transportation systems**



Description of recommended action. The principal means by which VMT can currently be reduced are through reducing growth in lane miles and increasing intermodal and multimodal (including nonmotorized) transportation access and use. In the context

of an automobile and truck fleet that cannot turn over (i.e. be replaced by more efficient vehicles and new fuels) in less than a decade regardless of other conditions, current efforts should concentrate on supporting planning and design of compact, mixed-use urban and suburban development and corresponding intermodal and multimodal transportation networks. Existing and proposed MnDOT plans and processes (e.g., interregional corridor plan, ATP, ETAT) should be used as foundations for support of compact urban and suburban development.

2A. Use alternative transportation planning and design processes and tools to support compact mixed-use development

Incorporate expanded transportation demand modeling (TDM) and Access Management modeling and other related strategies in statewide and local planning and project design to enhance local multimodal and passenger intermodal access that supports compact mixed-use development and resource conservation. For example, expanded Transportation Demand Management (TDM) analysis of MnDOT interregional corridor commutesheds, (i.e., areas of service at peak across modes) could suggest alternatives to usual applications of the functional classification standards. It is also important to have uniformity among expanded TDM requirements across neighboring communities so cities that implement expanded transit and nonmotorized TDM are not penalized budgetarily for their efforts by placing themselves at a disadvantage compared to civil divisions that do not implement TDM.

2B. Provide incentives for compact mixed-use development

Encourage and prioritize qualified transit and nonmotorized system fiscal investments in the STIP for regions that integrate local resource planning and performance-standard based design for compact development (Figure T6). Incorporate economic and employment development into resource protection.

For example, focus these approaches on the Twin Cities metropolitan area and other employment and service centers.

2C. Augment and communicate information on practices and performance of compact mixed-use development and transportation

Conduct interdisciplinary research (e.g., case studies) to correlate VMT changes with types, locations and scales of development in relation to transportation demand and planning for systems and modes. Establish databases on VMT-related statistics for resource-sensitive roadway network design and for patterns, intensities and combinations of land uses in multimodal and passenger intermodal development. EQB could provide research coordination of state agencies (e.g., MnDOT, MPCA); counties and localities (including minor civil divisions), educational institutions, and nonprofit stakeholders and foundations. Use this information to develop planning and design toolkits for the state, counties, metropolitan and local communities, developers, and citizens that include performance standards scorecards of structural and nonstructural approaches to VMT minimization/mitigation (e.g., based on models of per capita/per household VMT by land use configuration).

Transportation Recommendation 3: Develop and implement sustainable transportation research, design, planning, construction practices, regulations, and competitive incentive funding that minimize impacts on natural resources, especially habitat fragmentation and nonpoint source water pollution



Description of recommended action. This recommendation seeks to minimize, adapt, and mitigate habitat fragmentation and nonpoint source pollution from surface transportation (and related land uses) through research and design linkages via EQB, MPCA, and other stakeholders with MnDOT, and

through expanded regulation and funding incentives for innovative project approaches and increased environmental innovation on roadway design standards.

3A. Develop research programs on habitat fragmentation and planning, design, and construction techniques for adaptation, minimization, mitigation, and restoration

Roads fragment habitat. Some species are more or less impacted by road network configuration, width, pavement and shoulder treatments, bridging, and sizes and types of culverts. Species are generally also benefited by vegetated edge design and management and grade-separated crossings such as bridges or culverts. While there is a body of existing research around the academic efforts of Richard Forman, Daniel Sperling, and others, the main foci of environmental mitigation of habitat loss are still largely practice-based. See, for example, the FHWA CSS Web site (<http://www.fhwa.dot.gov/context/index.cfm>). For cases, see <http://www.contextsensitivesolutions.org/>.

Research is needed to explain land-cover and species relationships to local and regional impacts of road functional classification changes (widening and/or curbing), new routes, bridges, culverts, and other projects. Further research is needed to document effectiveness of innovative techniques including hybridizations of the functional classification, CSD/CSS, and innovative crossings of water.

3B. Develop research and design linkages of nonpoint source pollution to surface and ground waters from right-of-way and adjacent land uses that would improve performance of roadway-based infrastructure in relation to hydrological resource resilience and overall stability

In this state, water is always close, whether on the surface or in the ground. The cumulative and spatial impacts of transportation and associated land use development on water quality and aquatic habitat

are only beginning to be understood (Figure T7). Research is needed to develop a finer understanding of the spatial and biophysical dynamics and metrics of transportation-induced contamination of water, especially surface water, but in areas of high permeability, also ground water. Research on fate to ground and surface waters by land cover, land use, and soil types is needed to improve statewide storm-water performance standards for sediments and contaminants TMDLs. These standards could inform review of all transportation projects for NPDES permits as recommended here. The research would identify issues and model and test hypothetical conservation planning, design, implementation, and management practices across scales.

3C. Implement a standard baseline of habitat fragmentation and nonpoint discharge review for all projects that increase impervious highway roadway or drainage infrastructure surface in Minnesota

Require all new roadway projects or functional classification upgrade projects on existing roads to secure NPDES permits.

This recommendation could link project development more closely to comprehensive habitat data and impact analysis via the connection between the MnDOT statement of project purpose and need and environmental review. The statement of purpose and need provides the basis for developing a range of reasonable alternatives and, ultimately, identification of the preferred alternative. It also sets budgetary frameworks. If properly described, it also limits the range of alternatives that may be considered reasonable, prudent, and practicable in compliance with Council on Environmental Quality (CEQ) regulations, Section 4(f) of the Executive Order on Wetlands and Floodplains, and the Section 404(b) (1) guidelines. Further, it demonstrates the problems that will result if the no-build alternative is selected (<http://www.dot.state.mn.us/tecsup/xyz/plu/hpdp/book1/2b/class1/purpose-need.html>).

3D. Pilot incentive program grants for habitat and water-quality conservation design and construction innovations in transportation projects

The state should consider creating a grant program which would offer grants to MnDOT, counties, and local governments for transportation projects that demonstrate new or catalytic conservation approaches to road and related drainage design, development or (re)construction (Figure T8).

Energy Recommendations

Goal A

Promote alternative energy production strategies that balance or optimize production of food, feed, fiber, energy and other products with protection or improvement of environmental quality, including:

- water quality and water resource supply
- wildlife habitat
- greenhouse gas emissions
- soil quality and critical landscapes

Energy Recommendation 1: Develop coordinated laws, policies, and procedures for governmental entities to assess renewable energy production impacts on the environment



Develop laws, policies, and procedures for governmental entities to assess and manage the cumulative impacts on the environment of proposed and established energy production facilities, focusing on both individual and combined impacts. Information from this effort should be used to develop a biennial report to the legislature that informs the direction of the statewide conservation planning strategy.

Description of recommended action. Minnesota Statutes 116D.10-.11, require state agencies and the governor to prepare a biennial report to the legislature on efforts to address Minnesota's energy and environmental policies, programs, and needs. This requirement provides an ongoing vehicle within state government for internalizing, integrating, and tracking implementation of recommendations developed by the SCPP. Further, while the SCPP lays much of the foundation for future strategy reports, these reports will need to address other issues and describe how SCPP recommendations fit with them. For example, biofuel production initiatives are one component of a proposed package for meeting state greenhouse gas emission reduction goals. In addition, they are potentially a significant vehicle for addressing impaired waters. The biennial strategy report must ensure that these efforts complement one another (along with other state goals, such as enhancement of wildlife habitat) and that they are kept on track. This report would integrate information coming out of the permitting process for individual biofuel plants to paint a statewide picture of how energy production in Minnesota impacts state resources.

Two actions are needed. First, the law should be amended to explicitly reference the SCPP and to streamline requirements. Second, strategic investments are required to build state capability to develop biennial assessments and track progress across issues. A third package of actions, those investments needed to follow up on other conservation strategy recommendations, will contribute to the foundation upon which biennial assessments will be based.

Energy Recommendation 2: Invest in farm and forest preservation efforts to prevent fragmentation due to development guided by productivity and environmental vulnerability research

LP

Description of recommended action. Farm and forest fragmentation is a serious threat to wildlife habitat and ecosystem biodiversity. Expansion of urban

and agricultural areas often produces fragmentation of forests, and urban expansion reduces the land resource available for producing food, feed, fiber, and fuel. Strategies and policies are needed to protect farms and forests, and prevent fragmentation. The 2008 legislature provided a \$53,000 grant to the Minnesota Forest Resources Council (MFRC) to match \$150,000 in funding from the Blandin Foundation and Iron Range Resources for a study of forest parcelization and development, an assessment of available policy responses, and policy recommendations to the 2010 legislature. The 2007 legislature provided a \$40,000 grant to the UM Institute on the Environment that built on earlier MFRC research to assess potential impacts of parcelization and development on wildlife habitat and biodiversity in northern Minnesota. The state should consider recommendations from these studies relative to potential changes in policy or law, and relative to potentially funding specific proposals to prevent forest and farmland fragmentation due to development.

Energy Recommendation 3: Invest in perennial biofuel and energy crop research and demonstration projects on a landscape scale

SP

Invest in research and demonstration projects on a landscape scale to evaluate management and harvest techniques and yield potentials for various perennial biofuel crops (including monocultures of perennial grasses or woody biomass and polycultures) on different soils and agroecoregions throughout the state.

Description of recommended action. Based on nationwide analyses of potential biomass resources done by the U.S. Department of Energy (DOE) and USDA, energy crops are expected to play a major role in development of biomass resources for next-generation biofuels or carbon-neutral electrical generation. Coordinated research and policy experimentation should be carried out to develop and refine renewable energy production systems based on diversified biomass farming that emphasizes perennial

biomass crops. This initiative has great potential to improve environmental quality and support economic revitalization in rural Minnesota, while providing large amounts of biomass for renewable energy and bio-products. Developed properly, diversified biomass farming can help support current production agriculture while enhancing rural economic opportunities, producing locally grown renewable energy, and addressing important statewide water quality and environmental issues. In order to make energy crops a practical reality in the state, work is needed to improve yields through genetics and through identification of the optimal sites and BMPs for these crops. The state should support demonstration projects that bracket the various parts of the state so both yield and environmental questions associated with perennial crop production for given state locations can be ascertained in a timely manner. Existing data generated by the MFRC on forestry issues and county-based agricultural production data developed by the Center for Energy and Environment may be used to determine biomass availability. Opportunities and limitations associated with use of these resources should be identified. The effects of various assumptions about environmental impacts and biomass availability should be analyzed.

To move forward on commercial-scale pilot renewable-energy projects based on diversified biomass farming, it will be necessary to take a comprehensive approach to establish a bio-refining system that integrates production, processing, feedstock conversion/refining, and end-use market applications including but not restricted to energy production.

Energy Recommendation 4: Develop policies and incentives to encourage perennial crop production for biofuels in critical environmental areas



Invest in research and develop policies and financial incentives to encourage perennial crop production for biofuels on expiring CRP lands and other

environmentally sensitive or low-productivity lands. These research efforts, policies, and incentives should result in a balance between profitability and productivity on one hand, and benefits to the environment and wildlife habitat on the other hand.

Description of recommended action. The state should develop firm policies that would encourage the growth of energy crops on conservation lands and marginal farmlands and also reflect environmental and ecological needs for animal habitat and water resource conservation. There is currently an economic incentive for producers to plant productive expiring CRP land with row crops and small grains. Currently, there do not appear to be economic incentives for farmers or growers to grow perennial energy crops on these expiring environmentally sensitive lands. Policies and incentives are needed to encourage perennial biofuel crops on the most productive expiring CRP lands. Managers of low-productivity CRP lands should be encouraged to re-enroll them in conservation programs.

Energy Recommendation 5: Invest in data collection to support the assessment process



Invest in data collection to support the assessment process described in energy and mercury recommendation 1.

Data collection is needed in the following areas:

- Water quality
- Water resource sustainability (surface and ground water)
- Wildlife habitat and biodiversity
- Invasive species
- Land use changes
- Soil compaction, cover, and residue levels
- Infrastructure and storage needs for alternative fuel strategies
- GHG emissions

Description of recommended action. Minnesota needs a comprehensive approach to monitoring the cumulative impact of its energy production on the state environment. Data collection to support the monitoring and assessment of energy production should cover every step of the production process, and has the potential to inform the biennial report described in energy recommendation 1. Currently, many of the data needs listed above are incomplete or lacking entirely. Minnesota should fund data collection in these categories in locations around the state.

Energy Recommendation 6: Invest in research to determine sustainable removal rates of corn stover and to establish incentives and Best Management Practices (BMPs)



Invest in research to determine sustainable removal rates of corn stover for animal feed and biofuel production, and to establish incentives and BMPs for mitigating the adverse impacts of corn stover removal on soil carbon and erosion.

Description of recommended action. There is currently a debate among researchers and practitioners regarding how much corn stover may be removed from a field for biofuel or animal feed processing without significant negative impacts on soil carbon and erosion rates. Since the corn stover biofuel industry is close to being operational, the answer to this question in the Minnesota context is needed as soon as possible. If negative impacts of corn stover removal may be mitigated through farmer-installed BMPs (riparian buffer strips or cover crops), the state should encourage adoption of these BMPs.

Energy Recommendation 7: Invest in research to review thermal flow maps for Minnesota



Invest in research to review current thermal flow maps for Minnesota to assess their validity/accuracy,

and if necessary develop improved thermal flow maps, with the goal of informing geothermal power development in Minnesota

Description of recommended action. As a first step, the existing heat flow map for the state that was produced some years ago should be critiqued by experts from the Minnesota Geological Survey and their counterparts at the NRRI. Recent investigations of the current map seem to indicate that the existing projections for heat flow may be significantly underestimated due to the sampling technique used in the original data collection effort. Other countries at similar or higher latitudes, most notably Germany and Denmark, are adopting deep geothermal energy systems in order to produce necessary electrical power while reducing GHG emissions. A critical tool for assessing the viability of deploying this environmentally friendly energy technology is a thermal flow map for the state that relates the depth of the resource to the expected energy capture that may be possible.

Energy Recommendation 8: Invest in applied research to reduce energy and water consumption and green house gas emissions in present and future ethanol plants, and enact policies to encourage implementation of these conservation technologies



Description of recommended action. Minnesota should invest in applied research and demonstration projects that reduce water consumption, energy use, and CO₂ emissions at corn-based ethanol plants.

Energy Recommendation 9: Invest in research to determine the life cycle impacts of renewable energy production systems



Invest in research to determine the life-cycle impacts of renewable energy production systems on the rural economy, greenhouse gas emissions, water sustainability, water quality, carbon sequestration, gene flow

risks, and wildlife populations at landscape and regional scales while building on previous studies. This research should be used to direct the development of the renewable energy industry in Minnesota, including the storage and infrastructure needs associated with alternative fuels.

Description of recommended action. This recommendation is compatible with energy recommendations 1 and 5 in that it aims to estimate the cumulative impact of Minnesota's renewable energy development through data collection and analysis. Basically, the recommendation is that energy policy and incentives at the state level take a systems view, accounting for the resource benefits and impacts associated with each stage of energy production, transport, consumption, and associated waste processing. Research will be needed for legislators, citizens, and industry to make informed decisions about these benefits and impacts. Language to this effect should be added to legislation relevant to alternative energy development.

Energy Recommendation 10: Invest in research and demonstration projects to develop, and incentives to promote, combined wind power/biomass, wind power/ natural gas, and biomass/coal co-firing electricity projects



Description of recommended action. Integration of various energy production techniques that can help optimize the energy production system is an important opportunity for local communities, medium-size commercial and industrial users, and institutions in the state. As shown with the energy modeling work at the UM Morris, campus, a combined wind and biomass energy system allows overall optimization of energy production and the potential of almost complete energy self-sufficiency for the institution. The adoption of combined systems allows energy storage, peak loading, and stable energy generation issues to be addressed in a holistic fashion. For rural applications where biomass availability is high and wind conditions are favorable, systems can be envi-

sioned where a wind turbine system is coupled with a biomass gasification system to enhance the storage of off-peak power through generation of hydrogen and oxygen using water electrolysis. The produced gases then can be utilized to help facilitate improved gasifier operations. The stored oxygen can be used to displace air in the gasifier combustion process, and the hydrogen can be added to the producer gas to enhance its chemical potential to produce a syngas for natural gas replacement or additional power generation. The enhanced syngas can also be utilized to produce liquid fuels for use locally. Additionally, wind power/natural gas and biomass/coal electrical generation projects should be demonstrated that will allow GHG reductions while stabilizing electrical generation capacity in the state.

Energy Recommendation 11: Invest in research and enact policies to protect existing native prairies from genetic contamination by buffering them with neighboring plantings of perennial energy crops



Description of recommended action. In developing Minnesota's perennial biofuel industry (see energy recommendation 3), varieties may be selected for widespread planting that are not native to Minnesota, or that have been genetically modified from native plants. These biofuel plantings have the potential to genetically contaminate the state's native prairie remnants if they are close to these ecosystems. Research should be undertaken on the potential for this contamination, and policies should be developed to prevent it through mandated buffer plantings.

Energy Recommendation 12: Invest in efforts to develop sufficient seed or seedling stocks for large-scale plantings of native prairie grasses and other perennial crops



Description of recommended action. If perennial crops are to become a significant component of biofuel production in Minnesota, sufficient genetic stock for large-scale plantings will be necessary.

Goal B

Promote a healthy economy, including strategies that promote local ownership of alternative energy production and processing infrastructure, where appropriate.

Energy Recommendation 13: Invest in research and policies regarding “green payments”



Invest in research and policies on implementation strategies and optimal pricing schemes for green payments. These payments may be applied to perennial energy crop production on expiring CRP land, in impaired watersheds, on environmentally sensitive or low-productivity land, on DNR working lands, and on annual cropland. Multiple tiered payments for water quality, carbon, wildlife, fuel production, and other benefits may be considered, and special attention should be paid to helping producers through the transition period for perennial energy crop production. Knowledge and insights gained from previous multifunctional fuelshed experiments (at Waseca, Madelia, and UM Morris, for example) should be applied.

Description of recommended action. This recommendation fits well with energy recommendation 2. If adopted together, these two recommendations would strengthen the state’s efforts to protect environmentally sensitive land from intensive production, while providing benefits to farmers, local communities, natural resources, and wildlife. A green payment program should be informed by the most up-to-date scientific information on how biofuel production strategies impact natural resources. Farmers should be encouraged to plant perennial energy crops appropriate to their region (see energy recommendation 1).

Energy Recommendation 14: Investigate opportunities to provide tax incentives for individual investors in renewable energy (e.g., individuals who wish to install solar panels)



Description of recommended action. The state should make it easy and cost effective for individual homeowners or businesses to get their electricity from solar, geothermal, or wind power sources they install themselves. The specific financial mechanism needed to accomplish this goal should be developed in consultations between economists, policy makers, and citizen stakeholders. Other states (such as Massachusetts) have programs that might serve as an example.

Energy Recommendation 15: Invest in efforts to develop, and research to support, community-based energy platforms for producing electricity, transportation fuels, fertilizer, and other products that are locally/cooperatively owned



Description of recommended action. Many renewable energy sources (e.g., wind, biomass, and solar power) are located in the rural parts of the state. The localized development of alternative energy systems that can be placed at the source or nearby the source of the biomass materials will reduce the problems associated with logistical movement of unconsolidated biomass and reduce the transportation costs for biomass energy conversion. At the same time, the production and use of energy and energy products on a local basis will reduce infrastructure costs associated with power and fuels distribution. Both factors should allow localized development of smaller scale alternative energy systems that will benefit the local rural communities and add valued products to their economies. The state should encourage the development of these localized alternative energy systems by adoption of policies and incentives to facilitate their adoption. In addition, research and demonstration for systems that can facilitate the implementation of

this localized energy solution should be supported. Part of this support will involve transferring the lessons learned from successful community-based energy platforms (e.g., at UM, Morris; and Madelia, Coleraine Minerals Laboratory) to other communities interested in developing their own renewable energy platforms. The integration of local waste streams into energy production mechanisms is a key part of this recommendation.

Goal C

Promote efforts to improve energy conservation and energy efficiency among individuals, businesses, communities, and institutions.

Energy Recommendation 16: Provide incentives to transition a portion of Minnesota’s vehicle fleet to electrical power, while simultaneously increasing renewable electricity production for transportation



Description of recommended action. Powering Minnesota’s current transportation fleet solely with biofuels or fossil fuels is not feasible in the long term. Fueling our vehicles predominantly with ethanol would place enormous pressure on the state’s land resources, and would take land out of food production and conservation. Gasoline -powered vehicles contribute substantially to global climate change, and the rising price of gasoline creates an economic burden for Minnesota residents and businesses. Therefore, a state goal should be to transition the vehicle fleet away from dependence on both fossil fuels and biofuels. Powering vehicles with electricity derived from renewable sources makes sense from an ecological and sustainability standpoint, but is not yet economically viable. Several automakers have announced plans to sell electric vehicles within the next two years. However, the up-front cost for these vehicles will likely be more than for a conventional gas-powered vehicle. Minnesota should therefore provide appropriate incentives to encourage state residents

and businesses to purchase electric vehicles, with the goal of creating a robust electric vehicle sector in the state. The use of electric vehicles for commuting to work and while shopping locally in metropolitan environments where the commuting distances are relatively short should especially be encouraged.

These vehicles will require more capacity in the electricity sector, which should be provided with renewable sources (wind, solar, and geothermal). Some of this excess capacity may be mitigated by encouraging electric vehicle owners to charge their vehicles during off-peak hours (i.e., at night).

Energy Recommendation 17: Promote policies and incentives that encourage carbon-neutral businesses, homes, communities, and other institutions with an emphasis on learning from institutions already working toward this goal (e.g., UM, Morris)



Description of recommended action. Energy conservation and renewable fuel goals should be advanced simultaneously in Minnesota. Much more could be done to encourage businesses, homes, communities, and other institutions in Minnesota to dramatically reduce their carbon footprint through energy conservation and low-carbon fuel use. This recommendation fits well with energy recommendation 14—providing incentives for individuals to take advantage of solar, wind, and geothermal technologies would help them to become carbon neutral. Most likely, achieving carbon neutrality will require a portfolio of energy technologies and lowered energy consumption like that seen at UM, Morris (wind, biomass, etc.). Policies and incentives should be targeted to help individuals, businesses, communities, and institutions develop renewable energy portfolios appropriate for their situation.

Energy Recommendation 18: Implement policies and incentives to lower energy use of housing stock while monitoring the performance of improvements and calling on the utility industry to join in the effort



Description of recommended action. The envisioned housing improvements should consist of locally manufactured building material resources, especially those that use industry byproducts as their primary production feedstock. It is further recommended that the state develop specific policies and incentives to greatly improve construction practices for new residential homes. This can be accomplished by employing regional, sustainable building materials, and promoting the application of breakthrough systems approaches to new housing construction in an effort to drive down residential energy consumption. The UM has developed new technologies that present alternative means and methods for achieving vastly improved energy code compliance; these technologies should be further investigated to overcome implementation barriers.

Energy Recommendation 19: Promote policies and strategies to implement smart meter and smart grid technologies



Description of recommended action. Smart meter and smart grid technology is the next generation of electrical distribution technology. It provides for more local management and control of the energy used in the region and on site.

- The use of both smart meter and grid technology requires a series of advancements and changes in the current distribution practices. On a national level, there should be a uniform interconnection standard that would allow for a more robust mix of distributed and central-based power generation.
- At a state level, guidelines should be established for purchase of backup and supplemental power so that distributed combined heat and power (CHP) plants are not put at an

economic disadvantage when negotiating with investor-owned utilities.

- At a state level, investor-owned and electric cooperatives should be encouraged to move to smart grid technology and economic studies should be carried out to determine the benefit of incorporating distributed generation into the state's transmission grid.

Energy Recommendation 20: Develop incentives to encourage the widespread adoption of passive solar and shallow geothermal heat pump systems in new residential and commercial building construction; invest in research to develop improved technology for storing renewable energy



Description of recommended action. It is recommended that policies be adopted to encourage the widespread adoption of passive solar and shallow geothermal heat pump systems in new residential and commercial construction. Furthermore, it is recommended that incentives be developed to allow more widespread adoption of these technologies in existing structures where it is deemed to be a practical method for reducing water and habitat heating and cooling requirements. Utilities should be asked to incorporate specific programs to encourage structure owners to adopt these technologies in order to help meet the state's conservation goal as noted in existing Minnesota statutes.

Energy Recommendation 21: Develop standards and incentives for energy capture from municipal sanitary and solid waste, and minimize landfill options for MSW



Description of recommended action. A state mandate should be established that requires the capture of energy units from municipal solid waste (MSW) or municipal sanitary waste generated in the state. Appropriate statutory actions should be taken to establish targets for MSW use and minimization of landfill options for this waste material.

Energy Recommendation 22: Invest in public education focusing on benefits and strategies for energy conservation targeted toward individual Minnesota residents and businesses



Description of recommended action. Individual action is critical in reducing state energy demand, which will lower GHG emissions and reduce pressure on the land resource to provide alternative fuels. Specific examples of actions that should be encouraged may be found in the MCCAG recommendations. These include bicycle/pedestrian/public transit commuting, slower highway driving speeds, and purchasing energy-efficient appliances. There is a need to educate the public about lifestyle choices to reduce their energy consumption, particularly related to homes and transportation. Advertising and communications experts should be brought into this effort to disseminate the carbon reduction message in a creative way that reaches the broadest segment of the population possible.

Goal D (see related Appendix III)

Promote regulations, policies, incentives, and strategies to achieve significant reductions in mercury deposition in Minnesota.

Energy Recommendation 23: Develop mercury reduction strategies for out-of-state sources



Minnesota state agencies should work closely with the U.S. Environmental Protection Agency (USEPA) to develop mercury reduction strategies and assessment tools for the state, with the goal of meeting federal Clean Air Act and Clean Water Act standards. A mercury-reduction strategy should be developed that includes reduction of in-state demand for coal-powered electricity, and addresses mercury deposited in Minnesota from out-of-state sources.

Description of recommended action. Development of the national program that regulates mercury emissions from existing and future sources is very important in addressing the overwhelming contribution by sources from outside of Minnesota to the Minnesota environment (e.g., Minnesota water bodies). A federal mercury emissions program would minimize competitive disadvantage that regulations on the state levels potentially could create. Coordinated and joint efforts between the state agencies and the EPA would strengthen existing laws and reduce environmental loads of mercury.

Energy Recommendation 24: Continue state enforcement programs to reduce mercury loads



The MPCA should be provided with adequate resources to continue to enforce/support existing mercury regulations and programs that lead to reduced emissions of mercury in Minnesota through market restrictions, pollution control techniques, and disposal requirements.

Description of recommended action. Existing regulations reduce product-sector emissions. The MPCA works closely with and provides education to the industry sectors on mercury reduction strategies and new control technologies. The voluntary/enforcement programs have been successful in reducing mercury air and water emissions.

Energy Recommendation 25: Develop public education on actions that individuals and communities can take to reduce mercury loads



Minnesota should develop a strong public education and outreach effort focusing on the health risks associated with mercury pollution and on techniques for reducing mercury loads (including energy conservation and proper disposal of light bulbs) in the environment.

Description of recommended action. Currently there are a number of state-sponsored and community-based public education and outreach programs addressing mercury emissions. They are specific to certain industries (e.g., energy producing facilities), activities (e.g., disposal of light bulbs) or public health advisories (e.g., mercury fish concentrations). Although beneficial, the programs are often inaccessible by many Minnesota citizens because they are not greatly publicized. Creation of a single, large, well-coordinated interagency public-outreach and education program could potentially address many issues more effectively and efficiently. Promotion and recognition of a single program may be easier to achieve.

A PUBLIC-PRIVATE PARTNERSHIP

UNIVERSITY OF MINNESOTA



INSTITUTE ON THE
ENVIRONMENT



The LCCMR identifies funding priorities based on its Six Year Strategic Plan and publishes an Environment and Natural Resources Trust Fund Request for Proposals (RFP). A summary of the 2011-2012 (for FY 2012-2013) and 2010 (for FY 2011) funding priorities, project criteria, and background information is included here. Beginning with the 2011-2012 RFP, the LCCMR returned to a biennial funding recommendation cycle.

2011-2012 RFP Funding Priorities (for FY 2012-2013)

Proposals were requested in the following eight areas:

Natural Resource Data and Information, Water Resources, Methods to Protect, Restore and Enhance Land and Habitat, Land Acquisition for Habitat and Recreation, Aquatic and Terrestrial Invasive Species, Climate Change, Renewable Energy and Air Quality, Environmental Education, and Creative Ideas.

A. Natural Resource Data and Information

Proposals needed to address one or more of the following:

1. Collect baseline, foundational wildlife or natural resource data and information, including:
 - a. Ongoing efforts of the Minnesota County Biological Survey, Soil Survey, County Geological Atlas, and the National Wetlands Inventory update.
 - b. Climate data at a scale appropriate to assess natural resource changes attributable to accelerated climate change.
2. Coordination, facilitation, or training pertaining to statewide sharing, distribution, or innovative application of natural resource data and information tools, including Geographic Information Systems (GIS), Light Detection and Ranging (LiDAR), and other remote sensing techniques.

B. Water Resources

Proposals needed to address one or more of the following:

1. Protect or restore water quality by reducing soil erosion, reducing peak water flows, or improving water and land use practices. Projects must include monitoring and evaluation.
2. Research or engineering design to protect the health of humans and aquatic and terrestrial species by 1) advancing development or implementation of standards for nitrates or other contaminants; or 2) broadly reducing levels of nitrates, estrogenic, pharmaceutical, or other contaminants in ground and surface waters.
3. Research, monitoring, or evaluation of ground and surface water interaction and sustainability.
4. Research, monitoring, or evaluation of deep water lake ecosystems, including Lake Superior.
5. Investigate and increase the understanding of the distribution and hydraulic properties of aquitards (impermeable geological layers between aquifers) and the water quality and water quantity effects aquitards have on confined, leaky, and un-confined aquifers.

C. Methods to Protect, Restore, and Enhance Land and Habitat

Proposals needed to address one or more of the following:

1. Innovative protection, restoration, or enhancement of lands with high-quality natural resources, habitat, and ecological value.
2. Long term preservation of native forest, wetland, or prairie plant genetics and viability through long term storage in seed banks or other related efforts.
3. Technical assistance for prairie stewardship, forest stewardship, stewardship of Conservation Reserve Program lands and other agricultural lands, or aquatic buffer management to improve water quality.
4. Planning and implementation of community-based efforts to permanently conserve natural resources and reduce habitat fragmentation impacts on natural resources, including the impacts of transportation and other infrastructure.

D. Land Acquisition for Habitat and Recreation

Proposals needed to address fee title or permanent conservation easement acquisition of strategic lands with high quality natural resources, habitat, and/or ecological value, and the greatest capability to contribute multiple conservation benefits to wildlife, humans, and water quality. All lands to be acquired needed to provide a restoration/enhancement or management plan for the site and an explanation as to how it will be developed, implemented, and funded.

Priority was given to projects that addressed one or more of the following:

1. Efforts based on precision conservation* methods and analysis that quantifiably identify the lands most critical to acquire.
2. Efforts involving Scientific and Natural Areas (SNA) or that aim to protect unique ecosystems or rare, endangered, or threatened species.

3. Efforts in areas of the state with limited protected public lands providing habitat or public access.
4. Efforts that improve habitat connectivity.
5. Efforts that improve public access for natural resource management or outdoor recreation.

E. Aquatic and Terrestrial Invasive Species

Proposals needed to address one or more of the following:

1. Prevent introduction or provide early detection of new invasive species.
2. Reduce the spread of invasive species along streams, rivers, land transportation routes, and other vectors.
3. Alternative control techniques for containing or suppressing invasive species already present in Minnesota. Standard control and maintenance activities of invasive species will not be considered.

F. Climate Change, Renewable Energy, and Air Quality

Proposals needed address one or more of the following:

1. Research to help understand how to mitigate, adapt, or make Minnesota's ecosystems more resilient to climate change.
2. Implementation of innovative efforts aimed at mitigating, adapting, or making Minnesota's ecosystems more resilient to climate change.
3. Evaluation of applicability and/or effective implementation of clean energy technologies (e.g., biofuels, solar, geothermal, wind) or energy conservation in Minnesota. Focus examples include carbon emissions reduction; community-based, locally-produced renewable energy technologies; renewable energy life cycle costs and impacts; or smart energy technologies.
4. Reduction of greenhouse gas emissions through new and innovative approaches to increasing recycling and composting. Standard, required, and ongoing efforts will not be considered.
5. Innovative approaches to air quality improvement that reduce impacts on human health, the environment, or natural resources.

G. Environmental Education

Proposals needed to address education and training efforts that would increase the knowledge and skills of students and all citizens to improve and maintain water quality, reduce and monitor energy consumption, and restore and maintain a healthy and biodiverse natural environment. Funding for capital projects (e.g. buildings) was not considered.

Priority was given to projects that addressed one or more of the following:

1. Efforts that are locally-led, involve broad-based partnerships, provide outdoor experiences, and are committed to building a long-lasting and action-based conservation ethic in a community.
2. Environmental education programs using community plantings or gardens to teach biological or ecological concepts; use of native plants and/or organic practices are encouraged.
3. Efforts that deliver and implement existing curriculum, especially integration of environmental education into school curriculum.

H. Creative Ideas

Proposals were considered for efforts that were innovative or "out-of-the-box" and could produce transformative changes for the benefit of Minnesota's environment and natural resources, but did not fit under one of the other categories; or, that focused on new and emerging environment or natural resource issues and were time-sensitive, but did not fit under one of the other categories.

** Precision conservation is an emerging practice that considers lands in terms of the interconnected systems of which they are a part. As a practice, precision conservation compiles and integrates multiple types of available data layers and analysis (e.g., terrain analysis, soil productivity, habitat potential, economic analysis, erosion potential, proximity to surface water) to identify and guide efforts that will maximize conservation benefits.*

PROJECT REQUIREMENTS AND EVALUATION CRITERIA for 2011-2012 RFP

Project Requirements

- Expenditures must strictly adhere to the constitutional purpose of the Environment and Natural Resources Trust Fund (pg. 14) and conform to M.S. 116P.08, the laws governing the Environment and Natural Resources Trust Fund (pg. 14)
- Funds requested are expected to be expended and activities completed within 36 months. If additional time is needed, please explain in the “Timeline Requirements” section (section III-B) of the main proposal.
- Fee-title and conservation easement acquisition projects have the following additional requirements:
 1. First priority must be given to lands with high quality natural resources that provide multiple benefits and that provide natural buffers to water resources;
 2. Targeted lands must be identified in an adopted state, regional, or local natural resource plan;
 3. Conservation easements must be perpetual and include stewardship provisions to perpetually monitor and enforce the conditions of the conservation easements;
 4. Explanation must be provided for how a restoration/enhancement or management plan for the site will be developed, implemented, and funded (through this funding request or other funds);
 5. A list must be provided that identifies proposed acquisitions by parcel name, acquisition type (fee title or conservation easement), county, estimated # of acres, and geographical coordinates (latitude and longitude or UTM-X and UTM-Y).
- Restorations must plant vegetation only of ecotypes native to Minnesota and preferably of the local ecotype using a high diversity of species originating as close to the restoration site as possible and, when restoring prairies, protect existing prairies from genetic contamination. Use of seeds and plant material beyond these requirements must be expressly requested and approved. For additional guidance, see “Native Vegetation Establishment and Enhancement Guidelines” from the Minnesota Board of Soil and Water Resources: http://www.bwsr.state.mn.us/practices/seeding_guidelines.pdf
- All projects are subject to additional requirements including accessibility, data availability, land acquisition requirements, energy conservation and sustainability guidelines, and recyclable material requirements. Information located at www.lccmr.leg.mn titled “Additional Proposal Requirements”.

Evaluation Criteria

The following criteria will be considered in evaluating Environment and Natural Resources Trust Fund proposals (Additional explanation of evaluation criteria is available at www.lccmr.leg.mn):

1. **FUNDING PRIORITIES:** Responds to RFP funding priorities and LCCMR Six-Year Strategic Plan for the Environment and Natural Resources Trust Fund articulated and adopted by the LCCMR.
2. **MULTIPLE BENEFITS:** Delivers multiple benefits to Minnesota’s environment and natural resources.
3. **OUTCOMES:** Identifies clear objectives likely to result in measurable, demonstrated, and meaningful outcomes.
4. **KNOWLEDGE BASE:** Contributes to the knowledge base or disseminates information that will benefit other related efforts.
5. **EXTENT OF IMPACTS:** Results in broad, long-term impacts of statewide or regional significance.
6. **INNOVATION:** Employs or demonstrates innovative approaches to more effectively and efficiently solve specific environment and natural resources issues.
7. **SCIENTIFIC/TECHNICAL BASIS:** Reflects current scientific and technical knowledge, standards, and best practices.
8. **URGENCY:** Addresses an issue for which immediate future action is necessary and urgent to avoid undesirable consequences.
9. **CAPACITY AND READINESS:** Demonstrates capacity and readiness for efforts to be managed and completed in a timely, accountable, and effective manner.
10. **LEVERAGE:** Leverages collaborative partnerships and additional efforts, resources, and non-state dollars.
11. **RESULTING ADDITIONAL EMPLOYMENT:** Employs a significant number of additional or new employees or students in natural resources jobs that are direct to the funding request.

2010 RFP Funding Priorities (for FY 2011)

Proposals were requested in the following seven areas:

Water Resources, Renewable Energy Related to Climate Change, Habitat Restoration, Enhancement, and Acquisition, Invasive Species, Natural Resource Conservation Planning and Implementation, Environmental Education, and Creative Ideas.

A. Water Resources

Projects were sought that addressed water issues on a surface watershed or groundwater watershed basis as follows:

1. Groundwater Sustainability
 - a. Develop new or improved methods to identify and protect aquifer and groundwater recharge areas from loss or contamination.
 - b. Undertake scientific assessment of groundwater quality, quantity, and sustainability that can be utilized in regional and statewide ways to lead to improved groundwater recharge protection.
2. Estrogenic and Pharmaceutical Contaminants in Surface and Ground Waters
 - a. Document and evaluate the extent and level of estrogenic and pharmaceutical contaminants of wastewater treatment and industrial facility effluent in water bodies around the state.
 - b. Evaluate and quantify the threat to humans and animals from estrogenic compounds and pharmaceuticals in waters around the state.
 - c. Develop, test, and evaluate protocols and public education efforts for the proper disposal of estrogenic compounds and pharmaceuticals in order to protect water resources.
3. Aquatic Habitat Protection
 - a. Demonstrate and evaluate innovative practices to protect, improve, and prevent degradation of native aquatic habitat, including shoreland and near-shore, in-water habitat.
 - b. Continue to update the National Wetlands Inventory in Minnesota.

B. Renewable Energy Related to Climate Change

Projects were sought that reduced carbon and other greenhouse gas emissions as follows:

1. Evaluate applicability and effective implementation of different clean energy technologies in Minnesota, such as solar and geothermal technologies.
2. Encourage adoption of community-based, locally-produced, renewable and innovative clean energy technologies (this could include microgrids or smaller community networks).
3. Develop innovative pilot or demonstration projects to reduce carbon emissions from residential and other small energy consumers.

C. Habitat Restoration, Enhancement, and Acquisition

Projects were sought that protected, restored, and enhanced lands with high quality natural resources and habitat for wildlife and human benefit. This included but was not limited to Scientific and Natural Areas (SNAs), state and regional parks and trails, and sensitive shorelands or riparian habitat.

1. Restoration and Enhancement
 - a. Develop and disseminate guidelines for and/or provide training in state-of-the-art, science-based restoration for each of Minnesota's major ecotypes. Training should include field experience.
 - b. Conduct innovative restoration projects, including evaluation of the methods used.
 - c. Evaluate the effectiveness of restoration methods and projects in order to improve the effectiveness of future efforts.
2. Acquisition

Protect and enhance through fee title or permanent easement acquisition strategic lands that make the largest contribution to multiple benefits for conservation. The following parameters apply:

 - Lands to be acquired should be identified in an adopted state, regional, or local natural resource plan.

- All acquisition proposals must include an explanation as to how a restoration/enhancement and/or management plan for the site will be developed, implemented, and funded (either under this proposal or through other funding sources).
- Management should enhance the quality and diversity of natural resources.

D. Invasive Species

Projects were sought that addressed the threat of aquatic and terrestrial invasive species by developing new, innovative, and more effective control methods and by decreasing invisibility (making habitats less susceptible to invasion). Potential efforts could include:

1. Preventing introductions of new invasive species.
2. Providing early detection of new invasive species.
3. Reducing the spread of invasive species along transportation routes and other vectors.
4. Alternative control techniques for containing or suppressing invasive species already present in Minnesota, including but not limited to Curly-leaf Pondweed and Eurasian Watermilfoil. **This does not include funding typical maintenance activities such as harvesting and annual chemical treatments.*
5. Restoring or re-establishing terrestrial or aquatic habitats impacted by invasive species. Priority was given to habitats located on public land or private lands protected by permanent conservation easements.

E. Natural Resource Conservation Planning and Implementation

Projects were sought that developed and/or implemented integrated community-based natural resource, open space, and conservation plans to identify key opportunities to conserve local, regional, and state ecological, cultural, and outdoor recreational resources. Funds were intended to focus on natural resources including water and habitat, parks and open space, and other conservation planning and implementation efforts and not intended to subsidize other required local planning efforts.

F. Environmental Education

Projects were sought that provided innovative delivery of environmental education, including professional development, to both K-12 and adult audiences and resulted in increased community involvement and leadership on environmental issues. Preference was given toward efforts that developed understanding of climate change or that involved outdoor classroom settings.

G. Creative Ideas

Projects are sought that could produce transformative changes for the benefit of Minnesota's environment and natural resources, but which do not fit under categories A through F. The intention here is for "out of the box" thinking, ideas, and innovation that could result in significant, measureable benefits for Minnesota's air, land, water, fish, wildlife, and other natural resources.

PROJECT REQUIREMENTS AND EVALUATION CRITERIA for 2010 RFP

Project managers and partners must be accountable and able to complete project objectives. All proposals should, as appropriate:

- **Demonstrate innovative approaches** to solving natural resource issues;
- Have approaches that are **measurable and reflect current scientific standards** so that they can be evaluated to determine the most effective approaches;
- Have approaches that are **replicable** on future projects to more effectively and efficiently solve specific natural resource issues;
- Have **broad applicability** on a regional and/or statewide basis;
- **Add to the knowledge base** of addressing natural resource issues;
- State **clear objectives** for what the proposal will accomplish.

For acquisition and conservation easements, priority is to be given to acquiring lands with high quality natural resources and conservation lands that provide natural buffers to water resources. Conservation easements must be perpetual and include stewardship provisions to perpetually monitor and enforce the conditions of the conservation easements.

The use and protection of native species is required for all projects.

Restorations must utilize seeds and plants of the local ecotypes unless not available. The second preference is to have seeds and plants of the same eco-region, and the third preference is to have seeds and plants of an adjacent eco-region.

Criteria for Scoring Proposals:

The following seven criteria will be considered in evaluating Trust Fund proposals (in alphabetical order):

- Add to the knowledge base and disseminate information
- Broad applicability with long term impacts having statewide or
- Regional significance
- Innovation
- Leverage
- Measurable and demonstrated outcomes
- Partnerships
- Urgency

Some of the criteria may not be relevant to all proposals and may be determined to be non-applicable (N/A). A minimum of five of the seven criteria will be used to evaluate each proposal.

BACKGROUND INFORMATION

ELECTRONIC SUBMISSION REQUESTED

SUBMIT PROPOSAL:

WEB-BASED SUBMISSION

Go to: www.lccmr.leg.mn

If unable to use the web-based form you can:

EMAIL SUBMISSION

Email proposal in MS Word format to: trustfundrfp@lccmr.leg.mn

ELIGIBILITY

The spirit and intent of the LCCMR is to provide access to EVERYONE who has innovative ideas for environment and natural resource projects with a distinct public benefit that reflect the Commission's adopted Request for Proposal and Six-Year Strategic Plan.

No grant-making or lobbying assistance is necessary for success. LCCMR staff are available to assist in proposal development.

ELIGIBLE EXPENSES:

For a complete list of eligible and non-eligible expenses see <http://www.lccmr.leg.mn/manager/promanager.htm>.

PROPOSAL ASSISTANCE:

LCCMR staff are available to assist proposers, answer questions, or review draft proposals. **Applicants are encouraged to use this service.** If you would like assistance with proposal development, staff can assist you by phone, e-mail, fax, or by appointment.

Phone: (651) 296-2406

Fax: (651) 296-1321

Email: lccmr@lccmr.leg.mn

Address:

Legislative-Citizen Commission
on MN Resources
Room 65, State Office Building
100 Rev Dr Martin Luther King Jr Blvd
St. Paul, MN 55155

II. Projects Funded Preceding Biennium

“a description of each project receiving money from the trust fund during the preceding biennium;”

- The following documents are short abstracts for projects funded during the 2010-2011 biennium.
- Research projects have been marked as such in the description.
- Full work programs are available at the LCCMR, Room 65, State Office Building. The abstracts are current as of 12/30/10.
- Legal Citations
 - M.L. 2010, Chapter 362, Section 2
 - M.L. 2009, Chapter 143, Section 2

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND 2010 APPROPRIATIONS – M.L. 2010, Ch. 362

SUMMARY OF 2010 APPROPRIATIONS BY SUBDIVISION (\$26,144,000*)

SUBD. 3. Natural Resource Data and Information: \$4,920,000 (11 appropriations)

- Collection, mapping, interpretation, and delivery of foundational data pertaining to groundwater, wetlands, and bird populations.
- Assessment, planning, and outreach for bird conservation, farmland conservation, watershed protection, and the development of local food and perennial biofuels markets.
- Research, analysis, and outreach pertaining to moose habitat, pollinator decline, groundwater sustainability, carbon sequestration, and the application of unique microorganisms for bioenergy and bioremediation uses.

SUBD. 4. Land, Habitat, and Recreation: \$10,438,000 (9 appropriations)

- Development and implementation of a habitat restoration training program.
- Protection, restoration, and enhancement of priority land and habitat through fee title acquisition, conservation easements, and related efforts.
- Expansion of state outdoor recreational opportunities through improvement and expansion of parks and other public lands.
- Assessment and planning to reduce fragmentation and reconnect remaining prairie ecosystems.
- Outreach and technical assistance for landowners on conservation easements, shoreline protection, and wetlands protection.

SUBD. 5. Water Resources: \$3,455,000 (9 appropriations)

- Research and analysis pertaining to protection of water resources against contaminants including dioxins, pharmaceuticals, and compounds that disrupt endocrine system functions in humans, fish, and wildlife.
- Identification and evaluation of existing sources of sulfate released into surface waters from past mining activities and assessment of management and treatment options.
- Demonstration and assessment of innovative water storage and treatment for agricultural and urban runoff.
- Research and analysis pertaining to shallow lakes, shoreline, and trout streams that will result in recommendations for improved protection and management strategies.

SUBD. 6. Aquatic and Terrestrial Invasive Species: \$1,470,000 (4 appropriations)

- Continued evaluation of biological control methods for European buckthorn and garlic mustard.
- Research and analysis pertaining to the potential impacts of emerald ash borer on Minnesota's black ash forest communities and on strategies for helping forests resist invasive species infestation.
- Evaluation of innovative techniques for management of invasive round goby in Lake Superior.

SUBD. 7. Renewable Energy: \$3,221,000 (4 appropriations)

- Demonstration of sustainable energy strategies and practices including a pilot renewable energy system utilizing wastewater to produce algae biofuels, implementation of renewable energy systems and conservation practices at residential environmental learning centers visited by students from around the state, and development of habitat restoration harvesting as a biomass source for bioenergy.
- Research and analysis on sustainable practices to optimize perennial biofuel crop yields while maximizing soil carbon storage and resistance to invasive species.

SUBD. 8. Environmental Education: \$2,640,000 (11 appropriations)

- Training of teachers on integrating environmental and outdoor education into their classrooms and training of future conservation professionals through mentoring opportunities.
- Delivery of environmental education to urban youth and underserved communities through focused outdoors experiences.
- Continued establishment and enhancement of outdoor classrooms throughout the state.
- Development and delivery of environmental education pertaining to climate change, wolves, and the Minnesota River.

*Includes \$247,000 in Subd. 4 that were transferred from unused balances of project appropriations made in 2005 and 2009.

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND 2010 APPROPRIATIONS – M.L. 2010, Ch. 362

SUMMARY OF EXPECTED OUTCOMES ACROSS SUBDIVISIONS FOR ~\$26.1 MILLION

- **Natural Resource Inventory, Monitoring, Mapping, and Planning: ~\$3.6 million**
Inventory, monitoring, mapping, and planning efforts to obtain critical information and guide relevant decisions and efforts over time. This includes acceleration of the MN County Geologic Atlas program; MN Wetlands Inventory; MN Breeding Bird Atlas; and plans and recommended guidelines for bird conservation, watershed protection and improvement, prairie management, forest management, and farmland preservation.
- **Terrestrial and Aquatic Habitat Acquisition: ~\$6.5 million**
Acquisition of an estimated 2,775 acres in a combination of fee title (466 acres) and conservation easements (2,309 acres). Permanently protected areas will include forests, wetlands, shoreline, prairie, and other habitat for both human and animal benefit.
- **Terrestrial and Aquatic Habitat and Parkland Restoration and Improvement: ~\$3 million**
Restoration and improvement activities on an estimated 5,800 acres of habitat and parkland. Activities performed will include soil preparation, native vegetation installation, structural improvements, invasive species removal, and state park capital improvement.
- **Natural Resource Research and Analysis: ~\$7.2 million**
Research and analysis projects that will advance our knowledge about and provide recommendations for addressing issues relating to aquatic contaminants, groundwater resources, invasive species, pollinator decline, carbon sequestration, wildlife habitat, unique ecosystems, and energy production.
- **Environmental Education, Outreach, Demonstration, and Technical Assistance: ~\$5.8 million**
Environmental education, outreach, demonstration, and technical assistance efforts that will educate Minnesotans on topics including climate change, wildlife, ecosystems, and water resources; demonstrate options for energy efficiency and sustainability; and provide training, experiences, and outdoor spaces to facilitate learning about the natural world.

*Includes \$247,000 in Subd. 4 that were transferred from unused balances of project appropriations made in 2005 and 2009.

2010 PROJECTS

MN Laws 2010, Chapter 362, Section 2 (beginning July 1, 2010)

Summary of appropriations and expected outcomes

NOTE: For all projects, contact us to obtain the most up-to-date work programs for current projects (project updates are required twice each year) or the final reports of completed projects.

The following documents are short abstracts for projects funded during the 2010 Legislative Session. The final date of completion for these projects is listed at the end of the abstract. When available, we have provided links to a project's web site. The sites linked to this page are not created, maintained, or endorsed by the LCCMR office or the Minnesota Legislature.

Subd. 3 Natural Resource Data and Information

Subd. 4 Land, Habitat, and Recreation

Subd. 5 Water Resources

Subd. 6 Aquatic and Terrestrial Invasive Species

Subd. 7 Renewable Energy

Subd. 8 Environmental Education

Subd. 3 Natural Resource Data and Information

- 3a County Geologic Atlases and Related Hydrogeologic Research
- 3b Updating the Minnesota Wetlands Inventory: Phase 2
- 3c Minnesota Breeding Bird Atlas
- 3d Integrated, Operational Bird Conservation Plan for Minnesota
- 3e Mitigating Pollinator Decline in Minnesota - **RESEARCH**
- 3f Science and Innovation from Soudan Underground Mine State Park - **RESEARCH**
- 3g Quantifying Carbon Burial in Wetlands - **RESEARCH**
- 3h Strategic Planning for Minnesota's Natural and Artificial Watersheds
- 3i Ecosystem Services in Agricultural Watersheds
- 3j Farmland Conservation in Minnesota
- 3k Identifying Critical Habitats for Moose in Northeastern Minnesota - **RESEARCH**

Subd. 4 Land, Habitat, and Recreation

- 4a Ecological Restoration Training Cooperative for Habitat Restoration
- 4b Scientific and Natural Areas and Native Prairie Restoration, Enhancement, and Acquisition
- 4c State Park Improvements
- 4d State Park Land Acquisition
- 4e Protection of Rare Granite Rock Outcrop Ecosystem
- 4f Minnesota's Habitat Conservation Partnership Supplemental
- 4g Metropolitan Conservation Corridors Supplemental
- 4h Conserving Sensitive and Priority Shorelands in Cass County
- 4i Reconnecting Fragmented Prairie Landscapes

Subd. 5 Water Resources

- 5a Understanding Sources of Aquatic Contaminants of Emerging Concern - **RESEARCH**
- 5b Managing Mineland Sulfate Release in Saint Louis River Basin - **RESEARCH**
- 5c Ecological Impacts of Effluent in Surface Waters and Fish - **RESEARCH**
- 5d Agricultural and Urban Runoff Water Quality Treatment Analysis
- 5e Assessing Septic System Discharge to Lakes - **RESEARCH**
- 5f Evaluation of Dioxins in Minnesota Lakes - **RESEARCH**
- 5g Assessment of Shallow Lake Management - **RESEARCH**
- 5h Assessing Cumulative Impacts of Shoreline Development - **RESEARCH**
- 5i Trout Stream Assessmentss - **RESEARCH**

Subd. 6 Aquatic and Terrestrial Invasive Species

- 6a Biological Control of European Buckthorn and Garlic Mustard - **RESEARCH**
- 6b Ecological and Hydrological Impacts of Emerald Ash Borer - **RESEARCH**
- 6c Healthy Forests to Resist Invasion - **RESEARCH**
- 6d Bioacoustic Traps for Management of Round Goby - **RESEARCH**

Subd. 7 Renewable Energy

- 7a Algae for Fuels Pilot Project
- 7b Sustainable Biofuels - **RESEARCH**
- 7c Linking Habitat Restoration to Bioenergy and Local Economies
- 7d Demonstrating Sustainable Energy Practices at Residential Environmental Learning Centers (RELCs)
- 7e Analysis of Options for Minnesota's Energy Independence - **GOVERNOR VETO**

Subd. 8 Environmental Education

- 8a Minnesota Conservation Apprenticeship Academy
- 8b Engaging Students in Environmental Stewardship through Adventure Learning
- 8c Connecting Youth with Nature
- 8d Urban Wilderness Youth Outdoor Education
- 8e Get Outside - Urban Woodland for Kids
- 8f Expanding Outdoor Classrooms at Minnesota Schools
- 8g Integrating Environmental and Outdoor Education in Grades 7-12
- 8h Project Get Outdoors
- 8i Fishing: Cross Cultural Gateway to Environmental Education
- 8j Minnesota WolfLink
- 8k Online Field Trip of Minnesota River

Funding Source:
Environment and Natural Resources Trust Fund (TF)

Subd. 3 Natural Resource Data and Information

[Back to top of page](#)

County Geologic Atlases and Related Hydrogeologic Research

Subd. 3a \$1,130,000

Dale Setterholm

MN Geological Survey
2642 University Ave
St. Paul, MN 55114

Phone: (612) 627-4780 x223

Email: sette001@umn.edu

Fax: (612) 627-4784

Web: <http://www.geo.umn.edu/mgs/>

\$1,130,000 is from the trust fund to the Board of Regents of the University of Minnesota for the Geologic Survey to initiate and continue the production of county geologic atlases, establish hydrologic properties necessary to water management, and investigate the use of geochemical data in water management. This appropriation represents a continuing effort to complete the county geologic atlases throughout the state. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

[Back to top of page](#)

Updating the Minnesota Wetlands Inventory: Phase 2

Subd. 3b \$1,100,000

Steve Kloiber

DNR
500 Lafayette Rd, Box 25
St. Paul, MN 55155

Phone: (651) 259-5164

Email: steve.kloiber@dnr.state.mn.us

Web: http://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html

\$1,100,000 is from the trust fund to the commissioner of natural resources to continue the update of wetland inventory maps for Minnesota. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Minnesota Breeding Bird Atlas

Subd. 3c \$372,000

[Back to top of page](#)

PART 1 (\$211,000)

Mark Martell

Audubon Minnesota
2357 Ventura Dr, Ste 106
St. Paul, MN 55125

Phone: (651) 739-9332

Email: mmartell@audubon.org

Fax: (651) 731-1330

Web: <http://mnbbba.org/>

PART 2 (\$161,000)

Gerald Niemi

Natural Resources Research Institute (NRRI) - University of Minnesota
5013 Miller Trunk Hwy
Duluth, MN 55811

Phone: (218) 720-4270

Email: gniemi@nrri.umn.edu

Fax: (218) 720-4328

Web: <http://www.nrri.umn.edu>

\$372,000 is from the trust fund to continue development of a statewide survey of Minnesota breeding bird distribution and create related publications, including a book and online atlas with distribution maps and breeding status. Of this appropriation, \$211,000 is to the commissioner of natural resources for an agreement with Audubon Minnesota and \$161,000 is to the Board of Regents of the University of Minnesota for the Natural Resources Research Institute. The atlas must be available for downloading on the Internet free of charge.

Project due to be completed: 6/30/2012

Work Program - Part 1

Work Program - Part 2

Integrated, Operational Bird Conservation Plan for Minnesota

Subd. 3d \$151,000

[Back to top of page](#)

Lee Pfanmuller

Audubon Minnesota
2357 Ventura Dr, Ste 106
St. Paul, MN 55125

Phone: (612) 810-1173

Email: leepfann@msn.com

Fax: (651) 731-1330

Web: <http://mn.audubon.org/>

\$151,000 is from the trust fund to the commissioner of natural resources for an agreement with Audubon Minnesota to develop an integrated bird conservation plan targeting priority species and providing a framework for implementing coordinated, focused, and effective bird conservation throughout Minnesota.

Project due to be completed: 6/30/2012

Work Program

[Back to top of page](#)**Mitigating Pollinator Decline in Minnesota**

Subd. 3e \$297,000

Vera KrischikU of MN
1980 Folwell Ave, #219
St. Paul, MN 55108**Phone:** (612) 625-7044**Email:** krisc001@umn.edu**Fax:** (612) 625-5299

\$297,000 is from the trust fund to the Board of Regents of the University of Minnesota to assess the role of insecticides in pollinator health in order to help mitigate pollinator decline. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Science and Innovation from Soudan Underground Mine State Park[Back to top of page](#)

Subd. 3f \$545,000

Jeffrey GralnickU of MN
1479 Gortner Ave
St. Paul, MN 55108**Phone:** (612) 626-6496**Email:** gralnick@umn.edu

\$545,000 is from the trust fund to the Board of Regents of the University of Minnesota to characterize unique microbes discovered in the Soudan Underground Mine State Park and investigate the potential application in bioenergy and bioremediation. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Quantifying Carbon Burial in Wetlands[Back to top of page](#)

Subd. 3g \$144,000

James CotnerU of MN
100 Ecology, 1987 Upper Buford Cir, Dept. Ecology, Evolution and Behavior
St. Paul, MN 55108**Phone:** (612) 625-1706**Email:** cotne002@umn.edu**Fax:** (612) 624-6777

\$144,000 is from the trust fund to the Board of Regents of the University of Minnesota to determine the potential for carbon sequestration in Minnesota's shallow lakes and wetlands. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Strategic Planning for Minnesota's Natural and Artificial Watersheds[Back to top of page](#)

Subd. 3h \$327,000

David Mulla

U of MN
439 Borlaug Hall, 1991 Upper Buford Cir
St. Paul, MN 55108

Phone: (612) 625-6721

Email: mulla003@umn.edu

Fax: (612) 625-2208

\$327,000 is from the trust fund to the Board of Regents of the University of Minnesota to identify the interrelationship between artificial systems of drain tiles and ditches and natural watersheds to guide placement of buffers and stream bed restoration and modification.

Project due to be completed: 6/30/2012

Work Program

Ecosystem Services in Agricultural Watersheds

[Back to top of page](#)

Subd. 3i \$247,000

Kylene Olson

Chippewa River Watershed Project
629 North 11th Street, Suite 17
Montevideo, MN 56265

Phone: (320) 269-2139 ext. 116

Email: kylene.olson@charterinternet.com

Fax: (320) 269-6593

\$247,000 is from the trust fund to the commissioner of natural resources for an agreement with the Chippewa River Watershed Project to develop local food and perennial biofuels markets coupled with conservation incentives to encourage farmers to diversify land cover in the Chippewa River Watershed supporting improvement to water quality and habitat. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Farmland Conservation in Minnesota

[Back to top of page](#)

Subd. 3j \$100,000

Jennifer Jambor-Delgado

Farmers Legal Action Group, Inc. (FLAG)
360 N Robert St, #500
St. Paul, MN 55101

Phone: (651) 223-5400

Email: jjambor-delgado@flaginc.org

Fax: (651) 223-5335

\$100,000 is from the trust fund to the commissioner of natural resources for an agreement with the Farmers Legal Action Group, Inc. to assess the implementation of applicable laws for preserving agricultural land and develop a comprehensive and systematic approach and policy tools to preserve agricultural lands.

Project due to be completed: 6/30/2012

Work Program

Identifying Critical Habitats for Moose in Northeastern Minnesota

[Back to top of page](#)

Subd. 3k \$507,000

Ron Moen

UMD, NRRI
5013 Miller Trunk Hwy
Duluth, MN 55811

Phone: (218) 720-4279
Email: rmoen@nrri.umn.edu
Fax: (218) 720-4328
Web: <http://www.nrri.umn.edu/moose/>

\$507,000 is from the trust fund to the Board of Regents of the University of Minnesota for the Natural Resources Research Institute to identify critical habitats for moose, develop best management habitat protection practices, and conduct educational outreach in cooperation with the Minnesota Zoo. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Subd. 4 Land, Habitat, and Recreation

Ecological Restoration Training Cooperative for Habitat Restoration
Subd. 4a \$550,000

[Back to top of page](#)

Susan Galatowitsch
U of MN
1970 Folwell Ave
St. Paul, MN 55108

Phone: (612) 624-3242
Email: galat001@umn.edu
Fax: (612) 624-3242

\$550,000 is from the trust fund to the Board of Regents of the University of Minnesota for improving ecological restoration success in Minnesota by developing and offering training programs for habitat restoration professionals. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Scientific and Natural Areas and Native Prairie Restoration, Enhancement, and Acquisition
Subd. 4b \$1,750,000

[Back to top of page](#)

Peggy Booth
DNR
500 Lafayette Rd, Box 25
St. Paul, MN 55155

Phone: (651) 259-5088
Email: peggy.booth@dnr.state.mn.us
Fax: (651) 296-1811
Web: <http://www.dnr.state.mn.us/snass/index.html>

\$1,750,000 is from the trust fund to the commissioner of natural resources to acquire lands with high quality native plant communities and rare features to be established as scientific and natural areas as provided in Minnesota Statutes, section 86A.05, subdivision 5, restore parts of scientific and natural areas, and provide assistance and incentives for native prairie landowners. A list of proposed acquisitions must be provided as part of the required work program. Land acquired with this appropriation must be sufficiently improved to meet at least minimum management standards as determined by the commissioner of natural resources. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

State Park Improvements[Back to top of page](#)

Subd. 4c \$814,000

Larry Peterson

DNR

500 Lafayette Rd

St. Paul, MN 55155

Phone: (651) 259-5593**Email:** larry.Peterson@dnr.state.mn.us**Fax:** (651) 296-6532

\$567,000 is from the trust fund to the commissioner of natural resources for state park capital improvements and natural resource restoration. Of this amount, \$250,000 is for solar energy installations in state parks and the remaining amount shall be used for park and campground restoration and improvements. Priority shall be for projects that address existing threats to public water resources. On July 1, 2010, the unobligated balance, estimated to be \$200,000, of the appropriation for clean energy resource teams and community wind energy rebates in Laws 2005, First Special Session chapter 1, article 2, section 11, subdivision 10, paragraph (a), as amended by Laws 2006, chapter 243, section 15, and extended by Laws 2009, chapter 143, section 2, subdivision 16, is transferred and added to this appropriation. On July 1, 2010, the \$47,000 appropriated in Laws 2009, chapter 143, section 2, subdivision 6, paragraph (f), for native plant biodiversity, invasive plant species, and invertebrates is transferred and added to this appropriation.

Project due to be completed: 6/30/2012

Work Program

State Park Land Acquisition[Back to top of page](#)

Subd. 4d \$1,750,000

Larry Peterson

DNR

500 Lafayette Rd

St. Paul, MN 55155

Phone: (651) 259-5593**Email:** larry.Peterson@dnr.state.mn.us**Fax:** (651) 296-6532

\$1,750,000 is from the trust fund to the commissioner of natural resources to acquire and preserve critical parcels within the statutory boundaries of state parks. Land acquired with this appropriation must be sufficiently improved to meet at least minimum management standards as determined by the commissioner of natural resources. A list of proposed acquisitions must be provided as part of the required work program.

Project due to be completed: 6/30/2012

Work Program

Protection of Rare Granite Rock Outcrop Ecosystem[Back to top of page](#)

Subd. 4e \$1,800,000

Thomas Kalahar

Renville SWCD

1008 W Lincoln Ave

Olivia, MN 56277

Phone: (320) 523-1559**Email:** kalahar@yahoo.com**Fax:** (320) 523-2389

\$1,800,000 is from the trust fund to the Board of Water and Soil Resources, in cooperation with the Renville Soil and Water Conservation District, to continue to acquire perpetual easements of unique granite rock outcrops, located in the Upper

Minnesota River Valley. \$418,000 of this appropriation is for fiscal year 2010 and is available the day following final enactment.

Project due to be completed: 6/30/2012

Work Program

Minnesota's Habitat Conservation Partnership Supplemental

[Back to top of page](#)

Subd. 4f \$1,344,000

Joe Pavelko

Pheasants Forever (on behalf of all partners)
7975 Acorn Circle
Victoria, MN 55386

Phone: (612) 532-3800

Email: jpavelko@pheasantsforever.org

Fax: (320) 354-4377

Web: <http://www.mnhabitatcorridors.org>

\$1,344,000 is added to Laws 2009, chapter 143, section 2, subdivision 4, paragraph (e), from the trust fund for the acceleration of agency programs and cooperative agreements. Of this appropriation, \$308,000 is to the commissioner of natural resources for agency programs and \$1,036,000 is for agreements as follows: \$425,000 with Ducks Unlimited, Inc.; \$50,000 with National Wild Turkey Federation; \$164,000 with the Nature Conservancy; \$102,000 with Minnesota Land Trust; \$200,000 with the Trust for Public Land; \$45,000 with Friends of Detroit Lakes Wetland Management District; and \$50,000 to the Leech Lake Band of Ojibwe to plan, restore, and acquire fragmented landscape corridors that connect areas of quality habitat to sustain fish, wildlife, and plants. The United States Department of Agriculture Natural Resources Conservation Service is an authorized cooperating partner in the appropriation. Expenditures are limited to the project corridor areas as defined in the work program. Land acquired with this appropriation must be sufficiently improved to meet at least minimum habitat and facility management standards as determined by the commissioner of natural resources. This appropriation may not be used for the purchase of residential structures, unless expressly approved in the work program. All conservation easements must be perpetual and have a natural resource management plan. Any land acquired in fee title by the commissioner of natural resources with money from this appropriation must be designated as an outdoor recreation unit under Minnesota Statutes, section 86A.07. The commissioner may similarly designate any lands acquired in less than fee title. A list of proposed restorations and fee title and easement acquisitions must be provided as part of the required work program. All funding for conservation easements must include a long-term stewardship plan and funding for monitoring and enforcing the agreement.

- 2d Shallow Lake Assessment and Management (DNR)
- 2f Shallow Lake Habitat Enhancement and Wild Rice Enhancement and Monitoring (Leech Lake Band of Ojibwe)
- 2h Fisheries Habitat Restoration (DNR)
- 2k Prairie Management (DNR)
- 2n Campaign for Conservation (The Nature Conservancy)
- 2o Working Lands Partnership (Friends of the Detroit Lakes Wetland Management District)
- 2p Bluffland Restoration (National Wild Turkey Federation)
- 3a Shoreland Protection Project (Minnesota Land Trust)
- 3c Shallow Lake Easements (Ducks Unlimited)
- 3d Wetlands Reserve Program (Ducks Unlimited / USDA NRCS)
- 4b Fisheries Land Acquisition (DNR)
- 4c Critical Lands Protection Program (Trust for Public Land)
- 4f Campaign for Conservation (The Nature Conservancy)

Project due to be completed: 6/30/2012

Overall HCP Work Program (For work programs of individual partner projects, click links directly above)

Metropolitan Conservation Corridors Supplemental

[Back to top of page](#)

Subd. 4g \$1,750,000

Sarah Strommen

Minnesota Land Trust
2356 University Avenue West, Suite 240
St. Paul, MN 55114

Phone: (651) 647-9590
Email: ssstrommen@mnland.org
Fax: (651) 647-9769
Web: <http://www.dnr.state.mn.us/metroconservationcorridors>

\$1,750,000 is added to Laws 2009, chapter 143, section 2, subdivision 4, paragraph (f), from the trust fund to the commissioner of natural resources for acceleration of agency programs and cooperative agreements. Of this appropriation, \$1,750,000 is for agreements as follows: \$890,000 with the Trust for Public Land; \$485,000 with Minnesota Land Trust; \$325,000 with Minnesota Valley National Wildlife Refuge Trust, Inc.; and \$50,000 with Friends of the Minnesota Valley for planning, restoring, and protecting important natural areas in the metropolitan area, as defined under Minnesota Statutes, section 473.121, subdivision 2, and portions of the surrounding counties, through grants, contracted services, technical assistance, conservation easements, and fee title acquisition. Land acquired with this appropriation must be sufficiently improved to meet at least minimum management standards as determined by the commissioner of natural resources. Expenditures are limited to the identified project corridor areas as defined in the work program. This appropriation may not be used for the purchase of residential structures, unless expressly approved in the work program. All conservation easements must be perpetual and have a natural resource management plan. Any land acquired in fee title by the commissioner of natural resources with money from this appropriation must be designated as an outdoor recreation unit under Minnesota Statutes, section 86A.07. The commissioner may similarly designate any lands acquired in less than fee title. A list of proposed restorations and fee title and easement acquisitions must be provided as part of the required work program. All funding for conservation easements must include a long-term stewardship plan and funding for monitoring and enforcing the agreement.

- 2.4 Lower Minnesota River Watershed Restoration & Enhancement Project (Friends of Minnesota Valley)
- 3.1 Critical Land Protection Program (Trust for Public Land)
- 3.2 Protect Significant Habitat by Acquiring Conservation Easements (Minnesota Land Trust)
- 3.3 Minnesota Valley National Wildlife Refuge Fee Title Acquisition (Minnesota Valley National Wildlife Refuge Trust)

Project due to be completed: 6/30/2012

Overall MeCC Work Program (For work programs of individual partner projects, click links directly above)

Conserving Sensitive and Priority Shorelands in Cass County

[Back to top of page](#)

Subd. 4h \$300,000

John Ringle

Cass County Environmental Services Department
 300 Minnesota Ave, Box 3000
 Walker, MN 56484

Phone: (218) 547-7241
Email: john.ringle@co.cass.mn.us
Fax: (218) 547-7429
Web: <http://www.co.cass.mn.us>

\$300,000 is from the trust fund to the commissioner of natural resources for an agreement with Cass County to provide assistance for the donation of perpetual conservation easements to protect sensitive shoreland parcels for long-term protection of recreation, water quality, and critical habitat in north central Minnesota. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Reconnecting Fragmented Prairie Landscapes

[Back to top of page](#)

Subd. 4i \$380,000

Steve Chaplin

The Nature Conservancy
 1101 W River Pkwy, Ste 200
 Minneapolis, MN 55415

Phone: (612) 331-0750

Email: schaplin@tnc.org
Fax: (612) 331-0770

\$380,000 is from the trust fund to the commissioner of natural resources for an agreement with the Nature Conservancy to develop prairie landscape design plans and monitoring protocol involving local landowners and businesses to guide conservation, restoration, and related economic development. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Subd. 5 Water Resources

Understanding Sources of Aquatic Contaminants of Emerging Concern

[Back to top of page](#)

Subd. 5a \$640,000

Deborah Swackhamer

U of MN
Water Resources Center, 173 McNeal Hall, 1985 Buford Ave
St. Paul, MN 55108

Phone: (612) 625-0279
Email: dswack@umn.edu

\$640,000 is from the trust fund to the Board of Regents of the University of Minnesota to identify chemical markers to characterize sources of endocrine disruptors and pharmaceuticals entering surface waters in the Zumbro River Watershed. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Managing Mineland Sulfate Release in Saint Louis River Basin

[Back to top of page](#)

Subd. 5b \$270,000

Michael Berndt

DNR
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 259-5378
Email: mike.berndt@dnr.state.mn.us
Fax: (651) 296-5939

\$270,000 is from the trust fund to the commissioner of natural resources to map current sulfate sources and assess treatment options to minimize potential impacts of mercury on fish and wildlife from sulfate releases in the St. Louis River Basin. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Ecological Impacts of Effluent in Surface Waters and Fish

[Back to top of page](#)

Subd. 5c \$340,000

Paige Novak

U of MN
122 Civil Engineering Bldg, 500 Pillsbury Dr SE
Minneapolis, MN 55455

Phone: (612) 626-9846
Email: novak010@umn.edu
Fax: (612) 626-7750

\$340,000 is from the trust fund to the Board of Regents of the University of Minnesota in cooperation with St. Cloud State University to determine the chemical and biological fate of phytoestrogens in surface waters and the impacts on fish. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Agricultural and Urban Runoff Water Quality Treatment Analysis[Back to top of page](#)

Subd. 5d \$485,000

Craig Austinson

Blue Earth County Drainage Authority
410 Jackson Street
Mankato, MN 56001

Phone: (507) 304-4253
Email: Craig.Austinson@co.Blue-Earth.mn.us

\$485,000 is from the trust fund to the Board of Water and Soil Resources for an agreement with the Blue Earth County Drainage Authority to reduce soil erosion, peak water flows, and nutrient loading through a demonstration model evaluating storage and treatment options in drainage systems in order to improve water quality. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2014
Work Program

Assessing Septic System Discharge to Lakes[Back to top of page](#)

Subd. 5e \$594,000

Richard Kiesling

U.S. Geological Survey
2280 Woodale Dr
Mounds View, MN 55112

Phone: (763) 783-3131
Email: kiesling@usgs.gov
Fax: (763) 783-3103

\$594,000 is from the trust fund to the commissioner of health for department activities and for an agreement with the United States Geologic Survey in cooperation with St. Cloud State University to develop quantitative data on septic system discharge of estrogenic and pharmaceutical compounds and assess septic and watershed influences on levels of contamination and biological responses in Minnesota lakes. The United States Geologic Survey is not subject to the requirements in Minnesota Statutes, section 116P.10. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Evaluation of Dioxins in Minnesota Lakes[Back to top of page](#)

Subd. 5f \$1,130,000

William Arnold

U of MN
Dept of Civil Engineering, 500 Pillsbury Dr SE
Minneapolis, MN 55455

Phone: (612) 625-8582
Email: arnol032@umn.edu
Fax: (612) 626-7750

\$264,000 is from the trust fund to the Board of Regents of the University of Minnesota to examine the concentration of dioxins in lake sediment and options to improve water quality in lakes.

Project due to be completed: 6/30/2012
Work Program

Assessment of Shallow Lake Management
Subd. 5g \$262,000

[Back to top of page](#)

Mark Hanson
DNR
Wetland Wildlife Group, 102 23rd Street NE
Bemidji, MN 56601

Phone: (218) 308-2283
Email: mark.hanson@dnr.state.mn.us
Fax: (218) 755-2604

\$262,000 is from the trust fund to the commissioner of natural resources to evaluate the major causes of deterioration of shallow lakes in Minnesota and evaluate results of current management efforts. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Assessing Cumulative Impacts of Shoreline Development
Subd. 5h \$300,000

[Back to top of page](#)

Bruce Vondracek
U of MN
1980 Folwell Ave
St. Paul, MN 55108

Phone: (612) 624-8748
Email: bvondrac@umn.edu
Fax: (612) 625-5299

\$300,000 is from the trust fund to the Board of Regents of the University of Minnesota to evaluate near-shore, in-water habitat impacts from shoreline development activities to assist in the design and implementation of management practices protecting critical shorelands and aquatic habitat. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Trout Stream Assessments
Subd. 5i \$300,000

[Back to top of page](#)

Leonard Ferrington
U of MN
219 Hodson Hall, 1980 Folwell Ave
St. Paul, MN 55108

Phone: (612) 624-3265
Email: ferri016@umn.edu
Fax: (612) 625-5299

\$300,000 is from the trust fund to the Board of Regents of the University of Minnesota to assess cold water aquatic insect abundance related to warming water temperatures as predictors of trout growth in southeastern Minnesota and assess options to minimize stream temperature changes. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Subd. 6 Aquatic and Terrestrial Invasive Species

Biological Control of European Buckthorn and Garlic Mustard[Back to top of page](#)

Subd. 6a \$300,000

Luke Skinner

DNR
500 Lafayette Rd, Box 25
St. Paul, MN 55155

Phone: (651) 259-5140
Email: luke.skinner@dnr.state.mn.us
Fax: (651) 296-1811

\$300,000 is from the trust fund to the commissioner of natural resources in cooperation with the commissioner of agriculture to continue the development and implementation of biological control for European buckthorn and garlic mustard. This appropriation 14.2 is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Ecological and Hydrological Impacts of Emerald Ash Borer[Back to top of page](#)

Subd. 6b \$636,000

Anthony D'Amato

U of MN
1530 Cleveland Avenue N
St. Paul, MN 55108

Phone: (612) 625-3733
Email: damato@umn.edu
Fax: (612) 625-5212

\$636,000 is from the trust fund to the Board of Regents of the University of Minnesota to assess the potential impacts of emerald ash borer on Minnesota's black ash forests and quantify potential impacts on native forest vegetation, invasive species spread, and hydrology. This appropriation is available until June 30, 2015, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2015
Work Program

Healthy Forests to Resist Invasion[Back to top of page](#)

Subd. 6c \$359,000

Peter Reich

U of MN
1530 Cleveland Ave N
St. Paul, MN 55108

Phone: (612) 624-4270

Email: preich@umn.edu
Fax: (612) 625-5212

\$359,000 is from the trust fund to the Board of Regents of the University of Minnesota to assess the role of forest health management in resisting infestation of invasive species. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Bioacoustic Traps for Management of Round Goby
Subd. 6d \$175,000

[Back to top of page](#)

Allen Mensinger
U of MN - Duluth
1035 Kirby Dr
Duluth, MN 55812

Phone: (218) 726-7259
Email: amensing@d.umn.edu
Fax: (218) 726-8142

\$175,000 is from the trust fund to the Board of Regents of the University of Minnesota to evaluate bioacoustic technology specific to invasive round goby in Lake Superior as a method for early detection and population reduction. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Subd. 7 Renewable Energy

Algae for Fuels Pilot Project
Subd. 7a \$900,000

[Back to top of page](#)

Roger Ruan
U of MN
1390 Eckles Ave
St. Paul, MN 55108

Phone: (612) 625-1710
Email: ruanx001@umn.edu
Fax: (612) 624-3005

\$900,000 is from the trust fund to the Board of Regents of the University of Minnesota to demonstrate an innovative microalgae production system utilizing and treating sanitary wastewater to produce biofuels from algae. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013
Work Program

Sustainable Biofuels
Subd. 7b \$221,000

[Back to top of page](#)

David Tilman
Cedar Creek Ecosystem Science Reserve
100 Ecology, 1987 Upper Buford Circle
St. Paul, MN 55108

Phone: (612) 625-5740
Email: tilman@umn.edu

Fax: (612) 624-6777

\$221,000 is from the trust fund to the Board of Regents of the University of Minnesota to determine how fertilization and irrigation impact yields of grass monoculture and high diversity prairie biofuel crops, their storage of soil carbon, and susceptibility to invasion by exotic species. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Linking Habitat Restoration to Bioenergy and Local Economies

[Back to top of page](#)

Subd. 7c \$600,000

Barb Spears

DNR

1200 Warner Rd

St. Paul, MN 55106

Phone: (651) 259-5849

Email: barb.spears@dnr.state.mn.us

Fax: (651) 772-7977

Web: http://mndnr.gov/eco/habitat_biomass.html

\$600,000 is from the trust fund to the commissioner of natural resources to restore high quality native habitats and expand market opportunities for utilizing postharvest restoration as a bioenergy source. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Demonstrating Sustainable Energy Practices at Residential Environmental Learning Centers (RELCs)

[Back to top of page](#)

Subd. 7d \$1,500,000

MN COALITION OF RELCS

7d-1 (\$350,000)

Joe Deden

Eagle Bluff Environmental Learning Center

28097 Goodview Dr

Lanesboro, MN 55949

Phone: (507) 467-2437

Email: director@eagle-bluff.org

Fax: (507) 467-3583

7d-2 (\$206,000)

Bryan Wood

Audubon Center of the North Woods

P.O. Box 530

Sandstone, MN 55072

Phone: (320) 245-2648

Email: bwood@audubon-center.org

Fax: (320) 245-5272

7d-3 (\$212,000)

Dale Yerger

Deep Portage Learning Center

2197 Nature Center Drive NW

Hackensack, MN 564529

Phone: (218) 682-2325

Email: portage@uslink.net

Fax: (218) 682-3121

7d-4 (\$258,000)

Nick Temali

Laurentian Environmental Learning Center
8950 Peppard Road
Britt, MN 55710

Phone: (651) 621-7403

Email: nick.temali@moundsvIEWSchools.org

Fax: (651) 621-7405

7d-5 (\$240,000)

Todd Roggenkamp

Long Lake Conservation Center
28952 438th Lane
Palisade, MN 56469

Phone: (218) 768-4653

Email: todd@llcc.org

Fax: (218) 768-2309

7d-6 (\$234,000)

Kimberly Skyelander

Wolf Ridge Environmental Learning Center
6282 Cranberry Road
Finland, MN 55603

Phone: (218) 353-7414

Email: director@eagle-bluff.org

Fax: (218) 353-7762

\$1,500,000 is from the trust fund to the commissioner of natural resources for agreements as follows: \$206,000 with Audubon Center of the North Woods; \$212,000 with Deep Portage Learning Center; \$350,000 with Eagle Bluff Environmental Learning Center; \$258,000 with Laurentian Environmental Learning Center; \$240,000 with Long Lake Conservation Center; and \$234,000 with Wolf Ridge Environmental Learning Center to implement renewable energy, energy efficiency, and energy conservation practices at the facilities. Efforts will include dissemination of related energy education.

Project due to be completed: 6/30/2012

7d1-Work Program: Overall Project Coordination and Eagle Bluff Environmental Learning Center

7d2-Work Program: Audubon Center of the North Woods

7d3-Work Program: Deep Portage Learning Center

7d4-Work Program: Laurentian Environmental Learning Center

7d5-Work Program: Long Lake Conservation Center

7d6-Work Program: Wolf Ridge Environmental Learning Center

GOVERNOR VETO

[Back to top of page](#)

Analysis of Options for Minnesota's Energy Independence

Subd. 7e—\$143,000

Melisa Pollak

U of M
154 Hubert H. Humphrey Center 301 19th Ave. S.
Minneapolis, MN 55455

Phone:—

Email:—

Fax:—

\$143,000 is from the trust fund to the Board of Regents of the University of Minnesota for a life-cycle analysis of low carbon energy technologies available to implement in Minnesota.

Project due to be completed: 6/30/2012

Work Program

Subd. 8 Environmental Education

[Back to top of page](#)**Minnesota Conservation Apprenticeship Academy**

Subd. 8a \$368,000

Steve Woods

Board of Water and Soil Resources
520 Lafayette Rd N
St. Paul, MN 55155

Phone: (651) 297-7748**Email:** steve.woods@state.mn.us**Fax:** (651) 297-5615

\$368,000 is from the trust fund to the Board of Water and Soil Resources in cooperation with the Minnesota Conservation Corps or its successor to train and mentor future conservation professionals by providing apprenticeship service opportunities to soil and water conservation districts. This appropriation is available until June 30, 2013, by which time the project must be completed and the final products delivered.

Project due to be completed: 6/30/2012Work Program

[Back to top of page](#)**Engaging Students in Environmental Stewardship through Adventure Learning**

Subd. 8b \$250,000

Nicole Rom

Will Steger Foundation
2801 21st Avenue S, Ste 127
Minneapolis, MN 55407

Phone: (612) 278-7147**Email:** nicole@willstegerfoundation.org**Fax:** (612) 278-7101

\$250,000 is from the trust fund to the commissioner of natural resources for an agreement with the Will Steger Foundation to provide curriculum, teacher training, online learning, and grants to schools on investigating the connection between Minnesota's changing climate and the impacts on ecosystems and natural resources. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013Work Program

[Back to top of page](#)**Connecting Youth with Nature**

Subd. 8c \$160,000

Carrol Henderson

DNR
500 Lafayette Rd, Box 25
St. Paul, MN 55155

Phone: (651) 259-5104**Email:** carrol.henderson@dnr.state.mn.us**Fax:** (651) 296-1811**Web:** <http://www.dnr.state.mn.us/eco/nongame/projects/digitalbridge.html>

\$160,000 is from the trust fund to the commissioner of natural resources to hold teacher training workshops on the use of digital photography as a tool for learning about nature. The equipment must be provided from other funds.

Project due to be completed: 6/30/2012

Work Program

Urban Wilderness Youth Outdoor Education[Back to top of page](#)

Subd. 8d \$557,000

Greg Lais

Wilderness Inquiry
808 14th Avenue SE
Minneapolis, MN 55414

Phone: (612) 676-9409**Email:** greglais@wildernessinquiry.org**Fax:** (612) 676-9401

\$557,000 is from the trust fund to the commissioner of natural resources for an agreement with Wilderness Inquiry to provide an outdoor education and recreation program on the Mississippi River. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Get Outside - Urban Woodland for Kids[Back to top of page](#)

Subd. 8e \$218,000

Don Ganje

City of Saint Paul, Dept of Parks and Recreation
50 W Kellogg Blvd, Ste 840
St. Paul, MN 55102

Phone: (651) 266-6425**Email:** don.ganje@ci.stpaul.mn.us**Fax:** (651) 292-7405

\$218,000 is from the trust fund to the commissioner of natural resources for an agreement with the city of St. Paul, Department of Parks and Recreation, to restore and develop an outdoor classroom for ecological education and historical interpretation at Como Regional Park in St. Paul. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Expanding Outdoor Classrooms at Minnesota Schools[Back to top of page](#)

Subd. 8f \$300,000

Amy Kay Kerber

DNR
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 259-5263**Email:** amykay.kerber@dnr.state.mn.us**Fax:** (651) 259-5272**Web:** <http://www.mndnr.gov/schoolforest>

\$300,000 is from the trust fund to the commissioner of natural resources to establish additional and enhance existing outdoor school forest and prairie classroom networks throughout Minnesota.

Project due to be completed: 6/30/2012

Work Program

[Back to top of page](#)**Integrated Environmental and Outdoor Education in Grades 7-12**

Subd. 8g \$300,000

Beth Aune

Minnesota Department of Education
1500 Highway 36 West
Roseville, MN 55113-4266

Phone: (651) 582-8795**Email:** beth.aune@state.mn.us**Fax:** (651) 582-8876

\$300,000 is from the trust fund to the commissioner of education in cooperation with the commissioner of natural resources to train and support grade 7-12 teachers to integrate environmental and outdoor education into the instruction of academic standards.

Project due to be completed: 6/30/2012

Work Program

Project Get Outdoors

Subd. 8h \$15,000

[Back to top of page](#)**Sara Grover**

Project Get Outdoors, Inc.
Whitewater State Park, 19041 Hwy 74
Altura, MN 55910

Phone: (507) 951-5885**Email:** sara.grover@yahoo.com**Fax:** (507) 932-5938**Web:** <http://mnprojectgetoutdoors.org/>**Overall Project Outcomes and Results**

Project GO has developed a toolkit to help local communities design, implement, evaluate, and sustain free after-school and summer programs that introduce children to nearby public lands and outdoor activities and skills they can enjoy at these sites.

Through funds from the Minnesota Environment and Natural Resources Trust Fund, Project GO was able to assemble 50 Activity Backpacks and 32 Equipment Trunks for Project GO program leaders to use in their communities. Each program leader is issued a backpack to keep during their involvement with the Project GO program. The Activity Backpacks provide basic supplies to help leaders implement 100 or more different outdoor games, projects, and activities.

The Equipment Trunks focus on 16 different activities and are available for Project GO leaders to check out for free. These trunks are housed at Whitewater State Park for use in SE Minnesota and we anticipate the other set of 16 trunks will be housed out of Minneopa State Park for use by Project GO clubs in SW Minnesota.

At the time of this report, 14 backpacks have been issued. Equipment trunks are beginning to be checked out. Program leaders are excited to have these resources and so far, feedback has been very positive. The children are happy to have more diverse equipment and supplies to use while learning about the outdoors. We plan to evaluate the usefulness of these resources over the coming year via a program leader survey. One obstacle we are looking at is getting the equipment trunks to and from program sites that are farther from the storage site. We are hoping to develop a network of volunteer "runners" who would be reimbursed mileage for delivering and returning the equipment trunks when a GO site in a community such as Red Wing or Spring Grove desires to check out a trunk.

Project Results Use and Dissemination

The completed Activity Backpacks have already been issued to 14 sites. We will continue to help communities design Project GO programs that are unique as well as work with local staff at community organizations such as youth centers, school age child care programs, and other after school sites to introduce children in those programs to nature through our toolkit resources.

Since completing the assembly of the 50 Activity Backpacks and 32 Equipment Trunks, Project GO has formed a partnership with local public health and child care resource professionals to look at implementing our program into the

larger child care centers that serve school age children during the after school hours. We are currently piloting this at a child care center in Caledonia and looking to work with two child care centers in Rochester. We will train the school age room staff at these centers to use our backpacks at least once a week. As an incentive for them to use the backpacks and journal their experiences, Project GO will provide a person to come out to their site no more than once a month to lead a hands-on nature activity using one of the Equipment Trunks. This new approach with child care centers will allow us to serve many more children. Project GO will be presenting at an upcoming Focus on the Child conference in Rochester, sharing this information with child care providers from across the southern region.

A number of colleges and college professors in SE Minnesota have expressed enthusiasm to connect their students to service learning, internship, and practicum experiences with Project GO. We have found that college students bring great enthusiasm to the program which the children really enjoy and in exchange Project GO is able to provide real world learning experiences for these students.

We are already looking to secure additional funds to purchase more backpacks, as we anticipate the first 50 will be issued within a year. The US Fish & Wildlife Service Winona District is eager to help us acquire another batch of backpacks.

FINAL REPORT

Project completed: 11/16/2010

Fishing: Cross Cultural Gateway to Environmental Education

[Back to top of page](#)

Subd. 8i \$155,000

Ly Vang

Association for the Advancement of Hmong Women in MN
1101 N Snelling Ave
St. Paul, MN 55108

Phone: (651) 398-2917

Email: lyvangaahwm@yahoo.com

Fax: (651) 222-3599

\$155,000 is from the trust fund to the commissioner of natural resources for an agreement with the Association for the Advancement of Hmong Women in Minnesota to provide environmental information and teaching skills to and increase participation of Southeast Asian communities through the gateway of fishing skills. Information on mercury in fish advisories must be included as part of the educational outreach. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2013

Work Program

Minnesota WolfLink

[Back to top of page](#)

Subd. 8j \$193,000

Jerritt Johnston

International Wolf Center
1496 Highway 169
Ely, MN 55731

Phone: (218) 365-4695 x23

Email: jjohnston@wolf.org

Fax: (218) 365-3318

\$193,000 is from the trust fund to the commissioner of natural resources for an agreement with the International Wolf Center to develop interactive onsite and distance learning about wolves and their habitat. This appropriation is available until June 30, 2013, by which time the project must be completed and final products delivered.

Project due to be completed: 6/30/2012

Work Program

[Back to top of page](#)

Online Field Trip of Minnesota River

Subd. 8k \$124,000

Kimberly Musser

MN State University - Mankato
184 Trafton Science Center S
Mankato, MN 56001

Phone: (507) 389-5492**Email:** kimberly.musser@mnsu.edu**Fax:** (507) 389-5493

\$124,000 is from the trust fund to the commissioner of natural resources for an agreement with Minnesota State University - Mankato to develop online educational materials on the Minnesota River for schools and outreach centers.

Project due to be completed: 6/30/2012Work Program

LCCMR 2009 ENVIRONMENT AND NATURAL RESOURCES TRUST FUND APPROPRIATIONS

SUMMARY OF 2009 APPROPRIATIONS – \$25.6 million – MN Laws 2009, Chapter 143

SUBD. 3. Natural Resource Data and Information: \$5,995,000

- Collection, delivery, and interpretation of foundational data pertaining to statewide distributions of biodiversity and ecological systems.
- Collection, mapping, and delivery of foundational data pertaining to groundwater, soils, and wetlands.

SUBD. 4. Land, Habitat, and Recreation: \$13,227,000

- Expansion of state recreational opportunities through expanded parks, trails, and open space.
- Protection, restoration, and enhancement of priority land and habitat through acquisition, easements, and related efforts.
- Identification and ranking of the ecological value of Conservation Reserve Program (CRP) lands and other critical lands throughout the state.
- Outreach and technical assistance for landowners in the implementation of conservation programs for improvement of water quality and habitat.

SUBD. 5. Water Resources: \$1,788,000

- Research pertaining to the vulnerability of fish to compounds that disrupt endocrine system function.
- Assessment of the effects of ecological drivers of change on water quality, habitat quality, and fish populations in deep water lakes.
- Analysis and assessment of artificial drainage practices and policies in relation to erosion, water quality, and the protection of public waters.

SUBD. 6. Aquatic and Terrestrial Invasive Species: \$1,021,000

- Monitoring and treatment of ballast water to prevent the introduction and spread of aquatic invasive species in Lake Superior.
- Research pertaining to prevention and control of both invasive carp and an emerging fish disease in Minnesota waters.
- Identification and assessment to improve management and protect against the introduction and spread of invasive earthworms destructive to hardwood forests.

SUBD. 7. Energy: \$2,180,000

- Analysis and modeling to enhance future decision-making and planning for energy production, water resources, and habitat protection.
- Development and piloting of innovative strategies and programs for residential energy conservation.

SUBD. 8. Administration and Other: \$1,412,000

- LCCMR administration and project contract management.

SUMMARY OF EXPECTED OUTCOMES FOR \$25.6 MILLION

- **Natural Resource Inventory and Planning:** Approximately \$7.9 million in *inventory and planning* efforts to obtain critical information and guide relevant decisions and efforts over time. This includes acceleration of MN County Biological Survey, MN County Geologic Atlas program, MN Soil Survey, inventorying of restorable wetlands in MN, mapping and measurement of springsheds, identification and prioritization of critical lands, and plans for conservation and natural resource management.
- **Land and Habitat Acquisition:** Approximately \$9 million in land and habitat *acquisition* to protect forests, wetlands, shoreline, prairie, and other habitat for both human and animal benefit. The estimated acreage to be acquired in a combination of fee title and easements is 2,000 acres.
- **Land and Habitat Restoration:** Approximately \$2.2 million in land and habitat *restoration*. Activities performed will include soil preparation, native vegetation installation, structural improvements, and exotic and invasive species removal. Restoration activities will occur on an estimated 5,100 acres.
- **Natural Resource Research and Analysis:** Approximately \$2.6 million in *research and analysis* projects that will advance our knowledge about and provide recommendations for addressing problems relating to ballast water treatment, endocrine disruptors, invasive species movement, artificial drainage, energy production, climate change, and resource management.
- **Environmental Education and Outreach:** Approximately \$2.5 million in *environmental education and outreach* efforts that will assist communities with local conservation efforts and develop and pilot programs to increase residential energy efficiency statewide.
- **Administration:** Approximately \$1.4 million for FY 2010-2011 LCCMR administration (\$1,254,000) and DNR project contract management (\$158,000).

2009 PROJECTS

MN Laws 2009, Chapter 143, Section 2 (beginning July 1, 2009)

NOTE: For all projects, contact us to obtain the most up-to-date work programs for current projects (project updates are required twice each year) or the final reports of completed projects.

The following documents are short abstracts for projects funded during the 2009 Legislative Session. The final date of completion for these projects is listed at the end of the abstract. When available, we have provided links to a project's web site. The sites linked to this page are not created, maintained, or endorsed by the LCCMR office or the Minnesota Legislature.

Subd. 3 Natural Resource Data and Information

Subd. 4 Land, Habitat, and Recreation

Subd. 5 Water Resources

Subd. 6 Aquatic and Terrestrial Invasive Species

Subd. 7 Energy

Subd. 8 Administration and Other

Subd. 3 Natural Resource Data and Information

- 3a Minnesota County Biological Survey
- 3b County Geologic Atlas and South-Central Minnesota Groundwater
- 3c Soil Survey
- 3d Springshed Mapping for Trout Stream Management
- 3e Restorable Wetlands Inventory

Subd. 4 Land, Habitat, and Recreation

- 4a State Parks Acquisition
- 4b State Trail Acquisition
- 4c Metropolitan Regional Park System Acquisition
- 4d Statewide Scientific and Natural Area Acquisition and Restoration
- 4e Minnesota's Habitat Conservation Partnership (HCP) - Phase VI
- 4f Metro Conservation Corridors (MeCC) - Phase V
- 4g Statewide Ecological Ranking of Conservation Reserve Program (CRP) and Other Critical Lands
- 4h Protection of Granite Rock Outcrop Ecosystem
- 4i MN Farm Bill Assistance Project
- 4j Land and Water Conservation Account (LAWCON) Federal Reimbursement

Subd. 5 Water Resources

- 5a ~~Removal of Endocrine Disruptors: Treatment and Education~~ - **RESEARCH - GOVERNOR VETO**
- 5b Vulnerability of Fish Populations in Lakes to Endocrine Disrupting Contaminants - **RESEARCH**
- 5c Cooperative Habitat Research in Deep Lakes - **RESEARCH**
- 5d Intensified Tile Drainage Evaluation - **RESEARCH**
- 5e Citizen-Based Stormwater Management
- 5f Minnesota Drainage Law Analysis and Evaluation

Subd. 6 Aquatic and Terrestrial Invasive Species

- 6a Ballast Water Sampling Method Development and Treatment Technology - **RESEARCH**
- 6b Emergency Delivery System Development for Disinfecting Ballast Water - **RESEARCH**
- 6c Improving Emerging Fish Disease Surveillance in Minnesota - **RESEARCH**
- 6d Controlling the Movement of Invasive Fish Species
- 6e Prevention and Early Detection of Invasive Earthworms
- 6f ~~WITHDRAWN - Native Plant Biodiversity, Invasive Plant Species, and Invertebrates~~

Subd. 7 Energy

- 7a ~~Options to De-carbonize Minnesota's Electrical Power System~~ - **GOVERNOR VETO**
- 7b Projecting Environmental Trajectories for Energy-Water-Habitat Planning
- 7c Energy Efficient Cities

Subd. 8 Administration and Other

- 8a Contract Management

8b Legislative-Citizen Commission on Minnesota Resources (LCCMR)

Funding Sources: (**note: all projects are TF, unless otherwise noted)
Environment and Natural Resources Trust Fund (TF)
Great Lakes Protection Account (GLPA)
State Land and Water Conservation Account (LAWCON)

Subd. 3 Natural Resource Data and Information

Minnesota County Biological Survey

[Back to top of page](#)

Subd. 3a \$2,100,000

Carmen Converse

DNR
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 259-5083

Email: carmen.converse@dnr.state.mn.us

Fax: (651) 296-1811

Web: <http://www.dnr.state.mn.us/eco/mcbs/index.html>

\$2,100,000 is from the trust fund to the commissioner of natural resources for continuation of the Minnesota county biological survey to provide a foundation for conserving biological diversity by systematically collecting, interpreting, and delivering data on plant and animal distribution and ecology, native plant communities, and functional landscapes.

Project due to be completed: 6/30/2011

Work Program

County Geologic Atlas and South-Central Minnesota Groundwater

[Back to top of page](#)

Subd. 3b \$2,695,000

Part 1: County Geologic Atlas and South-Central Minnesota Groundwater (\$820,000)

Dale Setterholm

Minnesota Geological Survey
2642 University Ave. W.
St. Paul, MN 55114-1057

Phone: (612) 627-4780 x223

Email: sette001@umn.edu

Fax: (612) 627-4778

Web: <http://www.geo.umn.edu/mgs>

Part 2: County Geologic Atlas and South-Central Minnesota Groundwater (\$1,875,000)

Jim Berg

DNR
500 Lafayette Road
Saint Paul, MN 55155

Phone: (651) 259-5680

Email: jim.berg@dnr.state.mn.us

Fax: (651) 296-0445

Web: <http://www.dnr.state.mn.us/waters/index.html>

\$2,695,000 is from the trust fund for collection and interpretation of subsurface geological information and acceleration of the county geologic atlas program. \$820,000 of this appropriation is to the Board of Regents of the University of Minnesota for the geological survey to continue and to initiate the production of county geologic atlases. \$1,875,000 of this appropriation is to the commissioner of natural resources to investigate the physical and recharge characteristics of the Mt. Simon aquifer.

This appropriation represents a continuing effort to complete the county geologic atlases throughout the state. This

appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012

Work Program - Dale Setterholm

Work Program - Jim Berg

Soil Survey

Subd. 3c \$400,000

[Back to top of page](#)

Megan Lennon

BWSR

520 Lafayette Road N

Saint Paul, MN 55155

Phone: (651) 296-1285

Email: megan.lennon@state.mn.us

Fax: (651) 297-5615

Web: <http://www.bwsr.state.mn.us>

\$400,000 is from the trust fund to the Board of Water and Soil Resources to accelerate the county soil survey mapping and Web-based data delivery. This appropriation represents a continuing effort to complete the mapping. The soil surveys must be done on a cost-share basis with local and federal funds.

Project due to be completed: 6/30/2011

Work Program

Springshed Mapping for Trout Stream Management

Subd. 3d \$500,000

[Back to top of page](#)

Part 1: Springshed Mapping for Trout Stream Management (\$250,000)

E. Calvin Alexander, Jr.

U of M

310 Pillsbury Dr. Se

Minneapolis, MN 55455

Phone: (612) 624-3517

Email: alexa001@umn.edu

Fax: (612) 625-3819

Part 2: Springshed Mapping for Trout Stream Management (\$250,000)

Jeff Green

DNR

2300 Silver Creek Rd NE

Rochester, MN 55906

Phone: (507) 206-2853

Email: jeff.green@dnr.state.mn.us

Fax: (507) 285-7144

\$500,000 is from the trust fund to continue to identify and delineate supply areas and springsheds for springs serving as coldwater sources for trout streams and to assess the impacts from development and water appropriations. Of this appropriation, \$250,000 is to the Board of Regents of the University of Minnesota and \$250,000 is to the commissioner of natural resources.

Project due to be completed: 6/30/2011

Work Program - E. Calvin Alexander, Jr.

Work Program - Jeff Green

Restorable Wetlands Inventory

[Back to top of page](#)

Subd. 3e \$300,000

Darin Blunck

Ducks Unlimited, Inc.
2525 River Road
Bismarck, ND 58503

Phone: (701) 355-3500

Email: dblunck@ducks.org

Web: <http://www.ducks.org>

\$300,000 is from the trust fund to the commissioner of natural resources for an agreement with Ducks Unlimited, Inc., to complete the inventory, mapping, and digitizing of drained restorable wetlands in Minnesota. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012

Work Program

Subd. 4 Land, Habitat, and Recreation

State Parks Acquisition

[Back to top of page](#)

Subd. 4a \$590,000

Larry Peterson

DNR
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 259-5593

Email: larry.peterson@dnr.state.mn.us

Fax: (651) 296-6532

Web: <http://www.dnr.state.mn.us>

\$590,000 is from the trust fund to the commissioner of natural resources to acquire in-holdings for state parks. Land acquired with this appropriation must be sufficiently improved to meet at least minimum management standards as determined by the commissioner of natural resources. A list of proposed acquisitions must be provided as part of the required work program.

Project due to be completed: 6/30/2011

Work Program

State Trail Acquisition

[Back to top of page](#)

Subd. 4b \$1,000,000

Stan Linnell

DNR
500 Lafayette Road, Box 52
St. Paul, MN 55155

Phone: (651) 259-5626

Email: stan.linnell@dnr.state.mn.us

Fax: (651) 297-5475

Web: <http://www.dnr.state.mn.us>

\$1,000,000 is from the trust fund to the commissioner of natural resources to assist in the acquisition of the Brown's Creek Segment of the Willard Munger Trail in Washington County and Paul Bunyan State Trail in the city of Bemidji.

Project due to be completed: 6/30/2011

Work Program

[Back to top of page](#)**Metropolitan Regional Park System Acquisition**

Subd. 4c \$1,290,000

Arne StefferudMetropolitan Council
390 Robert Street North
St. Paul, MN 55101**Phone:** (651) 602-1360**Email:** arne.stefferud@metc.state.mn.us**Fax:** (651) 602-1674**Web:** <http://www.metrocouncil.org/parks/index.htm>

\$1,290,000 is from the trust fund to the Metropolitan Council for subgrants for the acquisition of lands within the approved park unit boundaries of the metropolitan regional park system. This appropriation may not be used for the purchase of residential structures. A list of proposed fee title and easement acquisitions must be provided as part of the required work program. All funding for conservation easements must include a long-term stewardship plan and funding for monitoring and enforcing the agreement. This appropriation must be matched by at least 40 percent of nonstate money and must be committed by December 31, 2009, or the appropriation cancels. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012

Work Program

Statewide Scientific and Natural Area Acquisition and Restoration[Back to top of page](#)

Subd. 4d \$590,000

Peggy BoothDNR
500 Lafayette Rd, Box 25
St Paul, MN 55155**Phone:** (651) 259-5088**Email:** peggy.booth@dnr.state.mn.us**Fax:** (651) 296-1811**Web:** <http://www.dnr.state.mn.us/snas/index.html>

\$590,000 is from the trust fund to the commissioner of natural resources to acquire high quality native plant communities and rare features and restore parts of scientific and natural areas as provided in Minnesota Statutes, section 86A.05, subdivision 5. A list of proposed acquisitions must be provided as part of the required work program.

Project due to be completed: 6/30/2011

Work Program

Minnesota's Habitat Conservation Partnership (HCP) - Phase VI[Back to top of page](#)

Subd. 4e \$3,375,000

Matt HollandPheasants Forever, Inc.
679 West River Drive
New London, MN 56273**Phone:** (320) 354-4377**Email:** mholland@pheasantsforever.org**Fax:** (320) 354-4377**Web:** <http://www.mnhabitatcorridors.org>

\$3,375,000 is from the trust fund to the commissioner of natural resources for the sixth appropriation for acceleration of agency programs and cooperative agreements. Of this appropriation, \$770,000 is for the Department of Natural Resources agency programs and \$2,605,000 is for agreements as follows: \$450,000 with Pheasants Forever; \$50,000 with Minnesota Deer Hunters Association; \$895,000 with Ducks Unlimited, Inc.; \$85,000 with National Wild Turkey Federation; \$365,000

with the Nature Conservancy; \$210,000 with Minnesota Land Trust; \$350,000 with the Trust for Public Land; \$100,000 with Minnesota Valley National Wildlife Refuge Trust, Inc.; \$50,000 with the United States Fish and Wildlife Service; and \$50,000 with Friends of Detroit Lakes Watershed Management District to plan, restore, and acquire fragmented landscape corridors that connect areas of quality habitat to sustain fish, wildlife, and plants. The United States Department of Agriculture-Natural Resources Conservation Service is a cooperating partner in the appropriation. Expenditures are limited to the project corridor areas as defined in the work program. Land acquired with this appropriation must be sufficiently improved to meet at least minimum habitat and facility management standards as determined by the commissioner of natural resources. This appropriation may not be used for the purchase of residential structures, unless expressly approved in the work program. All conservation easements must be perpetual and have a natural resource management plan. Any land acquired in fee title by the commissioner of natural resources with money from this appropriation must be designated as an outdoor recreation unit under Minnesota Statutes, section 86A.07. The commissioner may similarly designate any lands acquired in less than fee title. A list of proposed restorations and fee title and easement acquisitions must be provided as part of the required work program. All funding for conservation easements must include a long-term stewardship plan and funding for monitoring and enforcing the agreement. To the maximum extent practical, consistent with contractual easement or fee acquisition obligations, the recipients shall utilize staff resources to identify future projects and shall maximize the implementation of biodiverse, quality restoration projects in the project proposal into the first half of the 2010 fiscal year.

- 1a Project Coordination, Mapping & Data Management
- 2a Melvin Slough Landscape Restoration
- 2b Partners for Fish and Wildlife
- 2c Shallow Lake Enhancement
- 2d Shallow Lake Assessment & Management
- 2g Wildlife Areas Management
- 2h Fisheries Habitat Restoration
- 2i Bluffland Restoration/Set Out Seedlings
- 2j Lakescaping for Wildlife & Water Quality
- 2k Prairie Management
- 2n/4f Campaign for Conservation - Acquisition and Restoration
- 2o Prairie landscape Restoration: Oak Savanna, Grasslands, and Wetlands
- 3a Shoreland Protection Project - Conservation Easements
- 3c Shallow Lake Easements
- 3d Wetlands Reserve Program
- 4a Critical Lands Conservation Initiative - Acquisition
- 4b Fisheries Land Acquisition
- 4c Critical Lands Protection Program - Acquisition
- 4h Acquisition for Minnesota Valley Wetland Management District
- 4i Professional Services

Project due to be completed: 6/30/2011

Work Program

Metro Conservation Corridors (MeCC) - Phase V

Subd. 4f \$3,375,000

Wayne Sames

DNR

500 Lafayette Rd

St. Paul, MN 55155

Phone: (651) 259-5559

Email: wayne.sames@dnr.state.mn.us

Fax: (651) 296-6047

\$3,375,000 is from the trust fund to the commissioner of natural resources for the fifth appropriation for acceleration of agency programs and cooperative agreements. Of this appropriation, \$2,185,000 is for Department of Natural Resources agency programs and \$1,190,000 is for agreements as follows: \$380,000 with the Trust for Public Land; \$90,000 with Friends of the Mississippi River; \$155,000 with Great River Greening; \$250,000 with Minnesota Land Trust; \$225,000 with Minnesota Valley National Wildlife Refuge Trust, Inc.; and \$90,000 with Friends of the Minnesota Valley for the purposes of planning, restoring, and protecting important natural areas in the metropolitan area, as defined under Minnesota Statutes, section 473.121, subdivision 2, and portions of the surrounding counties, through grants, contracted services, technical assistance, conservation easements, and fee title acquisition. Land acquired with this appropriation must be sufficiently improved to meet at least minimum management standards as determined by the commissioner of natural resources. Expenditures are limited to the identified project corridor areas as defined in the work program. This appropriation may not be used for the purchase of residential structures, unless expressly approved in the work program. All conservation

[Back to top of page](#)

easements must be perpetual and have a natural resource management plan. Any land acquired in fee title by the commissioner of natural resources with money from this appropriation must be designated as an outdoor recreation unit under Minnesota Statutes, section 86A.07. The commissioner may similarly designate any lands acquired in less than fee title. A list of proposed restorations and fee title and easement acquisitions must be provided as part of the required work program. All funding for conservation easements must include a long-term stewardship plan and funding for monitoring and enforcing the agreement. To the maximum extent practical, consistent with contractual easement or fee acquisition obligations, the recipients shall utilize staff resources to identify future projects and shall maximize the implementation of biodiverse, quality restoration projects in the project proposal into the first half of the 2010 fiscal year.

- 1.1 Mapping and Coordination
- 2.3 Restore & Enhance Significant Watershed Habitat
- 2.4 Lower Minnesota River Watershed Restoration & Enhancement
- 2.5 Restore & Enhance Significant Habitat
- 2.6/3.4/4.1 Grants for Restoration, Acquisition, Easements, and Other Conservation Tools
- 2.7/3.6 Metro SNA Acquisition, Restoration & Enhancement
- 2.9 Stream Habitat Restoration
- 3.1 Critical Land Protection Program
- 3.2 Protect Significant Habitat by Acquiring Conservation Easements
- 3.3 Fee Acquisition for Minnesota Valley NWR
- 3.5 Fish & Wildlife Land Acquisition

Project due to be completed: 6/30/2011
Work Program

Statewide Ecological Ranking of Conservation Reserve Program (CRP) and Other Critical Lands
Subd. 4g \$107,000

[Back to top of page](#)

Greg Larson
BWSR
520 Lafayette Road N
Saint Paul, MN 55155

Phone: (651) 297-7029
Email: greg.a.larson@state.mn.us
Fax: (651) 297-5615
Web: <http://www.bwsr.state.mn.us>

\$107,000 is from the trust fund to the Board of Water and Soil Resources to continue the efforts funded by the emerging issues account allocation to identify and rank the ecological value of conservation reserve program (CRP) and other critical lands throughout Minnesota using a multiple parameter approach including soil productivity, landscape, water, and wildlife factors.

Project due to be completed: 6/30/2011
Work Program

Protection of Granite Rock Outcrop Ecosystem
Subd. 4h \$1,500,000

[Back to top of page](#)

Thomas Kalahar
Renville Soil and Water Conservation District
1008 West Lincoln
Olivia, MN 56277

Phone: (320) 523-1559
Email: kalahar@yahoo.com
Fax: (320) 523-2389
Web: <http://www.renvillewcd.com>

\$1,500,000 is from the trust fund to the Board of Water and Soil Resources, in cooperation with the Renville Soil and Water Conservation District, to acquire perpetual easements of unique granite rock outcrops located in the Upper Minnesota River Valley and to restore their ecological integrity.

Project due to be completed: 6/30/2011

Work Program

MN Farm Bill Assistance Project

Subd. 4i \$1,000,000

[Back to top of page](#)

Tabor Hoek

Board of Water and Soil Resources (BWSR)

520 Lafayette Rd N

St. Paul, MN 55155

Phone: (507) 537-7260

Email: tabor.hoek@state.mn.us

Fax: (507) 537-6368

Web: <http://www.bwsr.state.mn.us>

\$1,000,000 is from the trust fund to the Board of Water and Soil Resources to provide funding for technical staff to assist in the implementation provisions of conservation programs including the federal farm bill conservation programs.

Documentation must be provided on the number of landowner contacts, program participation, federal dollars leveraged, quantifiable criteria, and measurement of the improvements to water quality and habitat.

Project due to be completed: 6/30/2011

Work Program

Land and Water Conservation Account (LAWCON) Federal Reimbursement

Subd. 4j \$400,000 (LAWCON)

[Back to top of page](#)

Wayne Sames

DNR

500 Lafayette Rd

St. Paul, MN 55155

Phone: (651) 259-5559

Email: wayne.sames@dnr.state.mn.us

Fax: (651) 296-6047

\$400,000 is from the state land and water conservation account (LAWCON) in the natural resources fund to the commissioner of natural resources for priorities established by the commissioner for eligible state projects and administrative and planning activities consistent with Minnesota Statutes, section 116P.14, and the federal Land and Water Conservation Fund Act.

Project due to be completed: 6/30/2011

Work Program

Subd. 5 Water Resources

GOVERNOR VETO

Removal of Endocrine Disruptors: Treatment and Education

Subd. 5a \$275,000

[Back to top of page](#)

Paige Novak

U of M

122 Civil Engineering Building, 500 Pillsbury Drive SE

Minneapolis, MN 55455

Phone: (612) 626-9846

Email: novak010@umn.edu

Fax: (612) 626-7750

Web: <http://www.ce.umn.edu/people/faculty/novak/>

RESEARCH

\$275,000 is from the trust fund to the Board of Regents at the University of Minnesota to continue research on the removal of endocrine disruptors from Minnesota's waters through strategies of enhancing treatment at wastewater treatment plants and decreasing the use of the compounds. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012

Work Program

Vulnerability of Fish Populations in Lakes to Endocrine Disrupting Contaminants[Back to top of page](#)

Subd. 5b \$297,000

Richard Kiesling

USGS

2280 Woodale Dr

Mounds View, MN 55112

Phone: (763) 783-3131

Email: kiesling@usgs.gov

Fax: (763) 783-3103

Web: <http://mn.water.usgs.gov/index.html>

RESEARCH

\$297,000 is from the trust fund to the commissioner of natural resources for an agreement with the United States Geologic Survey and St. Cloud State University to develop quantitative data on juvenile and adult fish vulnerability to endocrine-active emerging contaminants found in Minnesota lakes. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012

Work Program

Cooperative Habitat Research in Deep Lakes[Back to top of page](#)

Subd. 5c \$825,000

Donald Pereira

DNR

500 Lafayette Rd

St. Paul, MN 55155-4040

Phone: (651) 259-5231

Email: don.pereira@dnr.state.mn.us

Fax: (651) 297-4916

RESEARCH

\$825,000 is from the trust fund to the commissioner of natural resources to assess the consequences of large ecological drivers of change on water quality and habitat dynamics of deep water lakes with coldwater fish populations. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012

Work Program

Intensified Tile Drainage Evaluation[Back to top of page](#)

Subd. 5d \$300,000

Shawn Schottler

Science Museum of Minnesota

16910 152nd Street N
Marine on St. Croix, MN 55047

Phone: (651) 433-5953 x18
Email: schottler@smm.org
Fax: (651) 433-5924

RESEARCH

\$300,000 is from the trust fund to the Science Museum of Minnesota for the St. Croix watershed research station to conduct a comparative assessment of hydrologic changes in watersheds with and without intensive tile drainage to determine the effects of climate and tile drainage on river erosion. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012
Work Program

Citizen-Based Stormwater Management

[Back to top of page](#)

Subd. 5e \$279,000

Becky Rice

Metro Blooms
PO Box 17099
Minneapolis, MN 55417

Phone: (651) 699-2426
Email: becky@metroblooms.org
Web: <http://www.metroblooms.org>

\$279,000 is from the trust fund to the commissioner of natural resources for an agreement with Metro Blooms, in cooperation with Minnehaha Creek Watershed District and the city of Minneapolis, to install and evaluate the effectiveness of rain gardens on improving the impaired water of Powderhorn Lake in Minneapolis. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012
Work Program

Minnesota Drainage Law Analysis and Evaluation

[Back to top of page](#)

Subd. 5f \$87,000

Louis Smith

Smith Partners PLLP
400 Second Ave S, Suite 1200
Minneapolis, MN 55401

Phone: (612) 344-1400
Email: smith@smithpartners.com
Fax: (612) 344-1550
Web: <http://www.smithpartners.com>; <http://www.waterlaws.com>

\$87,000 is from the trust fund to the commissioner of natural resources for an agreement with Smith Partners PLLP to identify and analyze legal and policy issues where the drainage code conflicts with other laws impacting protection of public waters and wetlands.

Project due to be completed: 6/30/2011
Work Program

Subd. 6 Aquatic and Terrestrial Invaasive Species

Ballast Water Sampling Method Development and Treatment Technology[Back to top of page](#)

Subd. 6a \$366,000 (\$300,000 TF / \$66,000 GLPA)

Mary Jean FenskeMPCA
520 Lafayette Rd N
St. Paul, MN 55155**Phone:** (651) 297-5472**Email:** maryjean.fenske@state.mn.us**Fax:** (651) 296-8717**RESEARCH**

\$300,000 is from the trust fund and \$66,000 is from the Great Lakes protection account to the commissioner of the Pollution Control Agency in cooperation with the Department of Natural Resources to conduct monitoring for aquatic invasive species in ballast water discharges to Minnesota waters of Lake Superior and to test the effectiveness of ballast water treatment systems.

Project due to be completed: 6/30/2011

Work Program

Emergency Delivery System Development for Disinfecting Ballast Water[Back to top of page](#)

Subd. 6b \$125,000

Scott SmithUSGS
6505 - 65th Street NE
Seattle, WA 98115**Phone:** (206) 427-8374**Email:** sssmith@usgs.gov**Fax:** (206) 526-6654**RESEARCH**

\$125,000 is from the trust fund to the commissioner of the Pollution Control Agency for an agreement with the United States Geologic Survey to test the viability of treating ballast water through tank access ports or air vents as a means to prevent the spread of invasive species.

Project due to be completed: 6/30/2011

Work Program

Improving Emerging Fish Disease Surveillance in Minnesota[Back to top of page](#)

Subd. 6c \$80,000

Katharine PelicanU of M
1333 Gortner Avenue
St. Paul, MN 55108**Phone:** (612) 625-8561**Email:** pelicank@umn.edu**Fax:** (612) 624-4906**Web:** <http://www.vdl.umn.edu>**RESEARCH**

\$80,000 is from the trust fund to the Board of Regents of the University of Minnesota to assess mechanisms and control of the transmission of Heterosporosis, an emerging fish disease in Minnesota, to assist in future management decisions and research.

Project due to be completed: 6/30/2011

Work Program

Controlling the Movement of Invasive Fish Species

[Back to top of page](#)

Subd. 6d \$300,000

Vaughan Voller

U of M

2 Third Ave SE

Minneapolis, MN 55414

Phone: (612) 625-0764

Email: volle001@umn.edu

Web: <http://www.safl.umn.edu>

\$300,000 is from the trust fund to the Board of Regents of the University of Minnesota to develop and test sonic barriers that could be effective in preventing and controlling the movement of invasive carp in Minnesota's waterways. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012

Work Program

Prevention and Early Detection of Invasive Earthworms

[Back to top of page](#)

Subd. 6e \$150,000

Cindy Hale

U of M, NRRRI

5013 Miller Trunk Hwy

Duluth, MN 55811-1442

Phone: (218) 720-4364

Email: cmhale@d.umn.edu

\$150,000 is from the trust fund to the Board of Regents of the University of Minnesota Natural Resources Research Institute for a risk assessment of the methods of spreading, testing of management recommendations, and identification of key areas for action in the state to reduce the impacts of invasive earthworms on hardwood forest productivity. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Project due to be completed: 6/30/2012

Work Program

WITHDRAWN - Native Plant Biodiversity, Invasive Plant Species, and Invertebrates

[Back to top of page](#)

Subd. 6f \$47,000

Greg Hoch

Concordia College

901 8th Street S

Moorhead, MN 56562

Phone: (218) 299-3799

Email: hoch@cord.edu

Fax: (218) 299-3804

\$47,000 is from the trust fund to the commissioner of natural resources for an agreement with Concordia College to survey plant, pollinator, and invertebrate biodiversity in native and restored prairies to assess impacts on invasive species and food sources for grassland birds and ecosystem services.

~~Project due to be completed: 6/30/2011~~
~~Work Program~~

Subd. 7 Energy

GOVERNOR VETO

[Back to top of page](#)

~~Options to De-carbonize Minnesota's Electrical Power System~~
~~Subd. 7a \$143,000~~

~~Melisa Pollak~~

~~U of M
154 Hubert H. Humphrey Center 301 19th Ave. S.
Minneapolis, MN 55455~~

~~Phone: (612) 625-3046
Email: fryxx035@umn.edu
Fax: (612) 625-3513~~

~~\$143,000 is from the trust fund to the Board of Regents of the University of Minnesota to analyze the Minnesota Climate Change Advisory Group's greenhouse gas reduction recommendations related to electrical power from a life-cycle analysis and a socio-political perspective.~~

~~Project due to be completed: 6/30/2011~~
~~Work Program~~

Projecting Environmental Trajectories for Energy-Water-Habitat Planning
Subd. 7b \$180,000

[Back to top of page](#)

Peter Reich

U of M
220f Green Hall, Upper Buford Circle
St. Paul, MN 55108

Phone: (612) 624-4270
Email: preich@umn.edu
Fax: (612) 625-5212
Web: <http://www.forestry.umn.edu/people/facstaff/reic>

\$180,000 is from the trust fund to the Board of Regents of the University of Minnesota to combine detailed climatic records of Minnesota with present and past ecosystem boundaries to forecast future fine-scale flow of climate across the state impacting human activities and natural resources.

Project due to be completed: 6/30/2011
Work Program

Energy Efficient Cities
Subd. 7c \$2,000,000

[Back to top of page](#)

Carl Nelson

Center for Energy and Environment
212 3rd Avenue N, Suite 560
Minneapolis, MN 55436

Phone: (612) 335-5871
Email: cnelson@mncee.org
Fax: (612) 335-5888
Web: <http://www.mncee.org>

\$2,000,000 is from the trust fund to the commissioner of commerce for an agreement with the Center for Energy and Environment for demonstration of innovative residential energy efficiency delivery and financing strategies, training,

installation, evaluation, and recommendations for a utility residential energy conservation program.

Project due to be completed: 6/30/2011

Work Program

Subd. 8 Administration and Other

Contract Management

Subd. 8a \$158,000

[Back to top of page](#)

Wayne Sames

DNR

500 Lafayette Rd

St. Paul, MN 55155

Phone: (651) 259-5559

Email: wayne.sames@dnr.state.mn.us

Fax: (651) 296-6047

Web: <http://www.dnr.state.mn.us>

\$158,000 is from the trust fund to the commissioner of natural resources for contract management for duties assigned in Laws 2007, chapter 30, section 2, and Laws 2008, chapter 367, section 2, and for additional duties as assigned in this section.

Project due to be completed: 6/30/2011

Work Program

Legislative-Citizen Commission on Minnesota Resources (LCCMR)

Subd. 8b \$1,254,000

[Back to top of page](#)

Susan Thornton

Legislative-Citizen Commission on Minnesota Resources

100 Rev Dr Martin Luther King Jr Blvd, Rm 65

St. Paul, MN 55155

Phone: (651) 296-2406

Email: lccmr@lccmr.leg.mn

Fax: (651) 296-1321

Web: <http://www.lccmr.leg.mn>

\$1,254,000 is from the trust fund for fiscal years 2010 and 2011 and is for administration as provided in Minnesota Statutes, section 116P.09, subdivision 5.

Project due to be completed: 6/30/2011

III. Completed Research Projects

“a summary of any research project completed in the preceding biennium;”

This section includes summaries of all projects completed, including research projects.

- The following documents are summaries of accomplishments for each appropriation year and short abstracts for all projects completed since the previous biennial report of January 15, 2009.
- The abstracts describe the general accomplishments of each project for completed projects.
See <http://www.lccmr.leg.mn>
- Research projects have been marked as such in the description.
- Full final reports are available at the LCCMR, Room 65 - State Office Building. The abstracts are current as of 12/30/10.
- Legal Citations
 - M.L. 2008, Chapter 367, Section 2
 - M.L. 2007, Chapter 20, Section 2
 - M.L. 2006, Chapter 243, Sec. 20
(completed since January 15, 2009)
 - M.L. 2005, First Special Session, Article 1, Section 9
(completed since January 15, 2009)

2008 PROJECTS

MN Laws 2008, Chapter 367, Section 2 (beginning July 1, 2008)

NOTE: For all projects, contact us to obtain the most up-to-date work programs for current projects (project updates are required twice each year) or the final reports of completed projects.

The following documents are short abstracts for projects funded during the 2008 Legislative Session. The final date of completion for these projects is listed at the end of the abstract. When available, we have provided links to a project's web site. The sites linked to this page are not created, maintained, or endorsed by the LCCMR office or the Minnesota Legislature.

Subd. 3 Land and Habitat

Subd. 4 Water Resources

Subd. 5 Natural Resource Information

Subd. 6 Environmental Education

Subd. 7 Establishment of an Emerging Issues Account

Subd. 3 Land and Habitat

- 3a Metro Conservation Corridors (MeCC) - Phase IV
- 3b Vermillion River Corridor Acquisition and Restoration in Dakota County
- 3c Minnesota's Habitat Conservation Partnership - Phase V
- 3d Preserving the Avon Hills Landscape
- 3e Minnesota River Valley Green Corridor Land Protection
- 3f Scientific and Natural Area Acquisition
- 3g State Land Acquisition Consolidation
- 3h State Park and Trail Land Acquisition
- 3i Metropolitan Regional Park System Land Acquisition
- 3j Local Initiative Grants - Regional Parks and Natural Areas
- 3k Conservation Partners/Environmental Partnerships Matching Grant Program
- 3l County Trail Systems Design
- 3m Accelerated Prairie Management, Survey, Acquisition and Evaluation
- 3n Prairie Ecosystem Restoration
- 3o Best Practices for Native Prairie Management
- 3p Impacts of Climate Change and CO2 on Prairie and Forest Production - **RESEARCH**
- 3q Biofuel Production and Wildlife Conservation in Working Prairies - **RESEARCH**

Subd. 4 Water Resources

- 4a Future of Energy and Minnesota Water Resources - **RESEARCH**
- 4b Accelerating Plans for Integrated Control of the Common Carp - **RESEARCH**
- 4c Testing Pesticides and Degradates in Public Drinking Water
- 4d Assessment of Riparian Buffers in the Whitewater River Watershed
- 4e Intra-Lake Zoning to Protect Sensitive Lakeshore Areas
- 4f Native Shoreland Buffer Incentives Program
- 4g Southeast Minnesota Stream Restoration Projects
- 4h South-Central MN Groundwater Monitoring and County Geologic Atlases
- 4i Lake Superior Research - **RESEARCH**

Subd. 5 Natural Resource Information

- 5a Updating the National Wetlands Inventory for Minnesota
- 5b Soil Survey
- 5c Updating Precipitation Intensities for Runoff Estimation and Infrastructure Designs
- 5d The Minnesota Breeding Bird Atlas
- 5e Restorable Wetlands Inventory
- 5f Wildlife Disease Data Surveillance and Analysis - **RESEARCH**
- 5g Conservation Easement Stewardship, Oversight and Maintenance
- 5h Conservation Easement Stewardship and Enforcement Program Plan

Subd. 6 Environmental Education

- 6a Waters of Minnesota Documentary on Watersheds
- 6b Global Warming - Reducing Carbon Footprint of Minnesota Schools

Subd. 7 Establishment of an Emerging Issues Account

Funding Sources: (**note: all projects are TF, unless otherwise noted)
 Environment and Natural Resources Trust Fund (TF)
 Great Lakes Protection Account (GLPA)

Subd. 3 Land and Habitat[Back to top of page](#)**Metro Conservation Corridors (MeCC) - Phase IV**

Subd. 3a \$3,150,000

Sarah Strommen

Minnesota Land Trust
 2356 University Avenue West, Suite 240
 St. Paul, MN 55114

Phone: (651) 647-9769**Email:** ssstrommen@mnland.org**Web:** <http://www.dnr.state.mn.us/metroconservationcorridors/index.html>**OVERALL PROJECT OUTCOME AND RESULTS**

During the fourth phase of the Metro Corridors project, the Metro Conservation Corridors Partners continued their work to accelerate protection and restoration of remaining high-quality natural lands in the greater Twin Cities Metropolitan Area by strategically coordinating and focusing conservation efforts within a connected and scientifically-identified network of critical lands. This corridor network stretches from the area's urban core to its rural perimeter, including portions of 16 counties.

The Partners employed a multi-faceted approach, which included accomplishments in four specific result areas:

1. Partnership and Program Coordination: Partners met quarterly to review project accomplishments and coordinate activity. With DNR support, the partners also continued efforts to develop an online database to facilitate tracking and reporting of MeCC projects over time.
2. Restore and Enhance Significant Habitat: Collectively, the partners restored 775 acres of land. Restoration of an additional 464 acres and 0.06 miles of shoreline was completed using other funds.
3. Acquire Significant Habitat: Collectively the partners protected 1,183 acres of land, including more than 4 miles of shoreline through acquisition of fee title and conservation easements and leveraged an additional 773 acres of land and more than 5 miles of shoreline using other funds.
4. Other Conservation Tools and Incentives: The Metro Greenways Program assisted three cities, two soil & water conservation districts, and one county with the development and gathering of natural resources information to identify sites for protection or restoration and/or to implement conservation measures.

Since 2003, MeCC partners have protected more than 8,000 acres and restored more than 6,500 acres. These strategic and coordinated efforts address a number of recommendations of the Statewide Conservation and Preservation Plan, including protecting priority land habitats, protecting critical shorelands of streams and lakes, restoring land, wetlands, and wetland-associated watersheds, and improving connectivity and access to outdoor recreation.

PROJECT RESULTS USE AND DISSEMINATION

As projects were completed, the individual partners were encouraged to publicize accomplishments through press releases, organization newsletters and websites. These efforts resulted in information being distributed to the public through websites, email lists, daily and weekly newspapers, newsletters, and other print materials. Additionally, once the MeCC database development is complete, the partnership plans to incorporate a public web portal, which will display accomplishments.

COMPLETE OVERALL FINAL REPORT**Abstracts and Reports of Individual Partner Projects**

- 1.1 Overall Summary and Coordination and Administration of MeCC Partnership (DNR)
- 2.1 Restore/Enhance Significant Watershed Habitat (Friends of the Mississippi River)
- 2.2 Lower Minnesota River Watershed Restoration & Enhancement Project (Friends of Minnesota Valley)
- 2.3 Restore and Enhance Significant Habitat (Great River Greening)
- 2.4 Metro Greenways Habitat Restoration and Enhancement Grants (DNR)
- 2.5 Scientific and Natural Area (SNA) Restoration and Enhancement (DNR)
- 3.1 Critical Lands Protection Program - Fee Title & Conservation Easement Acquisition (Trust for Public Land)
- 3.2 Protecting Significant Habitat by Acquiring Conservation Easements (Minnesota Land Trust)

- 3.3 Fee Acquisition for Minnesota Valley National Wildlife Refuge (Minnesota Valley National Wildlife Refuge Trust)
- 3.4 Metro Greenways Habitat Acquisition (DNR)
- 3.5 DNR Fish and Wildlife Acquisition (DNR)
- 3.6 Acquisition of Significant Habitat (DNR)
- 4.1 Metro Greenways Community Conservation Assistance Grants (DNR)

Project completed: 06/30/2010

Vermillion River Corridor Acquisition and Restoration in Dakota County

[Back to top of page](#)

Subd. 3b \$400,000

Alan Singer

Dakota County
14955 Galaxie Ave
Apple Valley, MN 55124

Phone: (952) 891-7001

Email: al.singer@co.dakota.mn.us

Fax: (952) 891-7031

Web: <http://www.co.dakota.mn.us>

Funds enable Dakota County to develop and begin implementation of a comprehensive and integrated water quality, wildlife habitat, and outdoor recreational corridor system plan for the 335 square mile Vermillion River watershed, located in the counties of Dakota, Scott, and Goodhue. Implementation using these funds includes fee title and conservation easement acquisition to protect approximately 125 acres and restoration efforts to enhance approximately 40 acres.

Project Publication:

Vermillion River Corridor Plan: Improving Water Quality, Habitat, and Recreation (PDF - 13.2 MB)

Project due to be completed: 6/30/2011

Work Program

Minnesota's Habitat Corridors Partnership - Phase IV

[Back to top of page](#)

Subd. 3c \$3,150,000

Joe Pavelko

Pheasants Forever, Inc
7975 Acorn Circle
Victoria, MN 55386

Phone: (612) 532-3800

Email: jpavelko@pheasantsforever.org

Web: <http://www.mnhabitatcorridors.org>

Overall Project Outcome and Results

During the period between July 1st, 2008 and June 30th, 2010, Minnesota's Habitat Conservation Partnership (HCP) collectively expended \$3,100,005 of Environment and Natural Resources Trust Fund (ENRTF) dollars to restore, enhance, or protect 8,143 acres of habitat and 199,832 feet of shoreline and riparian areas. Additionally, HCP used these funds to leverage an additional \$6,607,398 of other non-state funds to restore, enhance, or protect 8,423 acres of habitat and 23,585 feet of shoreline and riparian areas. In total, HCP expended \$11,877,328 to restore, enhance or protect a total of 17,397 acres of habitat and 152,780 feet of shoreline and riparian areas within the defined HCP project areas.

Partners expended a total of \$1,926,055 (\$1,140,480 ENRTF; \$785,575 other non-state funds) to restore/enhance a total of 9,081 acres (7,244 acres ENRTF; 1,837 other non-state funds). Work included 5,230 acres of grassland restoration/enhancement, 3,054 acres of wetland restoration/enhancement, 185 acres of woodland restoration, 27,380 feet of shoreline restoration, & 200 acres of wild rice restoration. Other accomplishments included shallow lake surveys, dam modifications, and site access/development.

Partners expended a total of \$7,484,898 (\$877,500 ENRTF; \$6,607,398 other non-state funds) to acquire 6,951 acres (616 acres ENRTF; 6,335 acres other non-state funds) of perpetual conservation easements. Grassland/wetlands continued to be a priority for HCP partners working on easements, with 6,152 acres protected. Shoreline/riparian areas were also a

priority with almost 32,000 feet protected. In addition, 504 acres of woodland was also permanently protected.

Partners expended a total of \$1,868,112 (\$994,985 ENRTF; \$873,127 other funds) to permanently protect 560 acres (309 acres ENRTF; 251 acres other non-state funds) in fee-title acquisition. HCP achieved 290 acres of new WMAs, 66 acres of AMAs, 124 acres of SNAs, and 80 acres of WPAs. Additionally, almost 10,000 feet of shoreline/riparian areas were protected.

For complete information, go to <http://www.mnhabitatcorridors.org>.

HCP Partners included: Ducks Unlimited, Fond du Lac Reservation, Friends of the Detroit Lakes Wetland Management District, Leech Lake Band of Ojibwe, MN Board of Water and Soil Resources, MN Deer Hunters Association, MN Department of Natural Resources, MN Land Trust, MN Valley National Wildlife Refuge Trust, Inc, National Wild Turkey Federation, Pheasants Forever, The Nature Conservancy, Trust for Public Land, U.S. Fish and Wildlife Service, U.S. Natural Resources Conservation Service.

Project Results Use and Dissemination The partnership acknowledges funding from the Minnesota Environment and Natural Resources Trust Fund. Accomplishment report information, mapping products, and project information can be found at <http://www.mnhabitatcorridors.org>. Other forms of information can be obtained by contacting Joe Pavelko, the HCP Coordinator, at (612) 532-3800.

COMPLETE OVERALL FINAL REPORT

Abstracts and Reports of Individual Partner Projects

- 0x Overall Summary of HCP - Phase IV
- 1a Project Coordination and Mapping (Pheasants Forever)
- 2a Hides for Habitat Restoration (Minnesota Deer Hunter Association)
- 2b Partners for Fish and Wildlife (U.S. Fish and Wildlife Service)
- 2c Living Lakes Enhancement (Ducks Unlimited)
- 2d Shallow Lakes Assessment and Management (DNR)
- 2e* Fond du Lac - Wild Rice Habitat Restoration (Fon du Lac Band of Chippewa) [***Dollars turned back; no expenditure. No Final Report.**]
- 2f Habitat Enhancement on Shallow Lakes and Forested Impoundments (Leech Lake Band of Ojibwe)
- 2g Wildlife Areas Management (DNR)
- 2h Fish Habitat Restoration (DNR)
- 2i Set out Seedlings (National Wild Turkey Federation)
- 2j Lakescaping (DNR)
- 2k Prairie Management (DNR)
- 2n Campaign for Conservation (The Nature Conservancy)
- 2o Working Lands Partnership (Friends of the Detroit Lakes Wetland Management District)
- 2o Bluffland Restoration (National Wild Turkey Federation)
- 3a Shorelands Protection Program (Minnesota Land Trust)
- 3c Living Lakes Enhancements (Ducks Unlimited)
- 3d Wetlands Reserve Program (Ducks Unlimited and U.S. Natural Resources Conservation Service)
- 3e RIM Reserve (BWSR)
- 4a Critical Lands Conservation Initiative (Pheasants Forever)
- 4b Fisheries and Wildlife Acquisition (DNR)
- 4c Critical Lands Protection Program (Trust for Public Land)
- 4h Habitat Acquisition for Minnesota Valley Wetland Management District of USFWS (Minnesota Valley National Wildlife Refuge Trust)
- 4i Habitat Acquisition - Professional Services (DNR)

Project due to be completed: 6/30/2010

Overall Work Program(For work programs of individual partner projects, click links directly above)

Preserving the Avon Hills Landscape

Subd. 3d \$337,000

Thomas Kroll

Saint Johns Arboretum and University
Box 3000
Collegeville, MN 56321

[Back to top of page](#)

Phone: (320) 363-3163
Email: tkroll@csbsju.edu
Fax: (320) 363-3202
Web: <http://www.csbsju.edu/arboretum/avonhills>

Saint John's Arboretum and University and the Minnesota Land Trust will work with local landowners, non-profit organizations, and local units of government to develop plans and implement land protection measures, including ordinances and conservation easements, that will benefit the Avon Hills landscape area (approximately 80 square miles in Stearns County) of central Minnesota. Implementation using these funds includes conservation easement acquisition to permanently protect approximately 450-1,000 acres. Conservation easements will be held and monitored by the Minnesota Land Trust.

Project due to be completed: 6/30/2011
 Work Program

Minnesota River Valley Green Corridor Land Protection

[Back to top of page](#)

Subd. 3e \$1,000,000

Nancy Fasching

Southwest Initiative Foundation
 PO Box 428
 Hutchinson, MN 55350

Phone: (320) 587-4848
Email: nancyf@swifoundation.org
Fax: (320) 587-3838
Web: <http://www.swifoundation.org>

Overall Project Outcome and Results

The Green Corridor Legacy Program will provide Minnesotans public access to high quality game and wildlife habitat through a multi-year land acquisition plan.

The initial phase of this project included:

- Acquisition of 249.23 acres of easement free fee-title acquisition conservation lands from willing sellers. This program acquired land from willing and supportive landowners. The land is purchased and then transferred to the DNR for long-term habitat conservation, outdoor recreational access, sustainability, and monitoring. These properties include the Whispering Ridge Aquatic Management Area in Redwood County (182.87 acres), Beaver Falls Aquatic Management Area in Renville County (6.6 acres), and two additions to Fort Ridgely State Park in Renville County (29.85 acres and 30 acres).
- Development of a conservation plan guidance document that insures both the natural resources and the natural history of this corridor are restored, conserved, protected and utilized in manners that balance the ecological, cultural, socio-economic and recreational needs of today, while preserving these resources for future generations.
- Organization of a variety of stakeholders into a working partnership team committed to the vision for a Green Corridor in the Minnesota River Valley.

Project Results Use and Dissemination

Results from this project have been disseminated as follows:

- The conservation plan will be used to guide and vet proposed acquisitions by Green Corridor, Inc.
- More importantly, the plan will be used as a key decision support system by a wide variety of conservation partners and stakeholders within the project area to craft and implement a conservation and economic vision for the project area.
- The plan will be disseminated principally through the web, but is also available in limited numbers via CD and hard copy format. In the near future, once the new Tatanka Bluff Council website is fully operational, a recap of these FY08 ENRTF appropriation accomplishments will be posted on this website under the "Green Corridor" icon tab. The website will ask viewers for comments and feedback concerning the various strategies and outcomes related to this project and the Conservation Plan. The project will also served as a cornerstone for future funding requests to the LCCMR and from the Outdoor Heritage Fund.

The communications and outreach activities that have been done for the Minnesota River Valley Green Corridor Project include:

- The plan has been adopted by Green Corridor, Inc. as its conservation vision for the Middle Minnesota Valley.
- The final plan was presented to the public on May 6th, 2010 at the Tatanka Bluffs Council annual meeting at the Redwood Area Community Center in Redwood Falls MN.

- The conservation plan entitled, "Conservation in the Middle Minnesota Valley: A Blueprint and Action Plan" was produced in hard copy, CD and web format. The product will be available via the following web sites: Green Corridor, Inc. (www.tatankabluffs.com) and Great River Greening (www.greatrivergreening.org).
- Since the start of this project in the summer of 2008 numerous meetings, public forums, and media outreach activities have taken place that have illustrated the intended outcomes, accomplishments, and public benefits of this appropriation.

Project Publication:

Conservation in the Middle Minnesota Valley: A Blueprint and Action Plan (PDF - 14.6 MB)

FINAL REPORT

Project completed: 6/30/2010

Scientific and Natural Area Acquisition

Subd. 3f \$1,000,000

[Back to top of page](#)

Peggy Booth

MN Department of Natural Resources (DNR)
500 Lafayette Rd, Box 25
St. Paul, MN 55155

Phone: (651) 259-5088

Email: peggy.booth@dnr.state.mn.us

Fax: (651) 296-1811

Web: <http://www.dnr.state.mn.us/snas>

Overall Project Outcome and Results

Environment and Natural Resources Trust Fund (ENRTF) dollars from this appropriation contributed toward the acquisition of six sites protecting a total of 673 acres (211.3 acres using ENRTF dollars; 461.7 acres using other funds) with rare features and native plant communities. These acquisitions resulted in three new Scientific and Natural Area (SNA) units within the State Outdoor Recreation System - Chimney Rock SNA (Dakota County), Clinton Falls Dwarf Trout Lily SNA (Steele County), and Lester Lake SNA (Hubbard County) - plus additions to three existing SNAs - Franconia Bluffs SNA (Chisago County), Lake Alexander Woods SNA (Morrison County), and St. Wendel Tamarack Bog SNA (Stearns County).

About the sites:

- The 77-acre new Chimney Rock SNA acquisition included a landowner donation and funding from Dakota County and the Department's rare species mitigation funds (pro-rated at 44.6 acres for this appropriation). Chimney Rock SNA is named for its unique geological feature of statewide significance and contains four rare plant species.
- The 21-acre Clinton Falls Dwarf Trout Lily SNA contains the world's largest population of the Minnesota endemic species of dwarf trout lily which straddles and is riparian to the Straight River.
- The new 440-acre Lester Lake site - jointly managed as an SNA and an Aquatic Management Area (320 acres designated as SNA and 120 acres designated as AMA) - was acquired through the Trust for Public Land with funding support from the Outdoor Heritage Fund, Kabekona Lake Association and Foundation, and Reinvest in Minnesota (pro-rated at 30.3 ENRTF acres for this appropriation). This site fully contains the undisturbed 70-acre Lester Lake, forested and sedge meadow native plant communities, and habitat for state special concern red-shouldered hawk and white adder's mouth orchid.
- Additions to existing SNAs include various native forest communities at the 35-acre Franconia Bluffs SNA, Parcel 2 (prorated at approximately 15.4 acres ENRTF), a 40-acre addition to Lake Alexander Woods SNA, and a 60-acre addition to the St. Wendel Tamarack Bog.

FINAL REPORT RECEIVED - AWAITING REVISION

Project completed: 6/30/2010

State Land Acquisition Consolidation

Subd. 3g \$500,000

[Back to top of page](#)

Craig Engwall

MN Department of Natural Resources (DNR)

1201 E Hwy 3
Grand Rapids, MN 55744

Phone: (218) 999-7913
Email: craig.engwall@dnr.state.mn.us
Fax: (218) 327-4263
Web: <http://www.dnr.state.mn.us>

Establishment of a revolving account of funds the Department of Natural Resources (DNR) can use to consolidate state land ownership in Northern Minnesota in order to reduce forest fragmentation and enhance management efficiency. Funds in the account can finance the acquisition of lands of significant natural resource value adjacent to existing DNR forest lands; funds are replenished through the sale of isolated DNR parcels in difficult to manage areas.

Project due to be completed: 6/30/2011
Work Program

State Park and Trail Land Acquisition

[Back to top of page](#)

Subd. 3h \$1,500,000

Larry Peterson (Parks) and Stan Linnell (Trails)

MN Department of Natural Resources (DNR)
500 Lafayette Rd
St. Paul, MN 55155

Phone: Larry Peterson: (651) 259-5593; Stan Linnell: (651) 259-5626
Email: larry.peterson@state.mn.us and stan.linnell@dnr.state.mn.us
Fax: (651) 296-6532 [Parks]; (651) 297-5475 (Trails)
Web: <http://www.dnr.state.mn.us>

Overall Project Outcome and Results

The Trust Fund funding allowed for the following State Parks and State Trails land acquisition projects:

- Ownership of approximately 158 acres currently for sale adjacent to Monson Lake State Park. Adding this parcel will provide additional access to a high quality lake and is adjacent to state park ownership.
- Ownership of approximately 360 acres at George Crosby Manitou State Park. Acquisition of this parcel will provide protection to one of the largest and highest quality old-growth northern hardwood forest complexes in the Lake Superior Highlands.
- The DNR Parks and Trails Division made offers to acquire four parcels of land for the Mill Towns State Trail that were rejected by the landowners at the end of June 2010. An Amendment request to transfer the remaining funds to Result 5-acquisition of approximately 1.25 miles of Paul Bunyan State Trail was approved on August 17, 2010.
- The DNR Parks and Trails Division made offers to acquire one parcel in Maplewood State Park that was rejected by the landowner at the end of June 2010.
- Ownership of approximately 1.25 miles of the Paul Bunyan State Trail. The property acquired is comprised entirely of former industrial property and is located adjacent to the shoreline of Lake Bemidji. This acquisition is partially funded through LCCMR and provides for State ownership of a significant segment of the remaining authorized Paul Bunyan State Trail. The acquired trail segment is to be constructed during 2011. Additional funding through Capital Bonding (2005 and 2006) and 2009 LCCMR was also used for this project.

See attached map for locations.

All acquisitions are from willing sellers, within the statutory boundaries of state parks and for statutory authorized state trails as determined by the Commissioner.

FINAL REPORT

Project completed: 6/30/2010

Metropolitan Regional Park System Land Acquisition

[Back to top of page](#)

Subd. 3i \$1,500,000

Arne Stefferud
Metropolitan Council

390 N Robert St
St. Paul, MN 55101

Phone: (651) 602-1360
Email: arne.stefferud@metc.state.mn.us
Fax: (651) 602-1467
Web: <http://www.metrocouncil.org>

The Metropolitan Council will grant these funds to metropolitan regional park agencies, along with a required minimum 40% match of non-state funds, to acquire approximately 225 acres within approved regional park unit boundaries in the Metropolitan Regional Park System.

Project due to be completed: 6/30/2011
Work Program

Local Initiative Grants - Regional Parks and Natural Areas

[Back to top of page](#)

Subd. 3j \$1,000,000

Wayne Sames

MN Department of Natural Resources (DNR)
500 Lafayette Rd.
St. Paul, MN 55155

Phone: (651) 259-5559
Email: wayne.sames@dnr.state.mn.us
Fax: (651) 296-6047
Web: <http://www.dnr.state.mn.us>

Co- Project Manager:

Marc Mattice

Wright County Parks
1901 Highway 25 North
Buffalo, MN 55313

Phone: (763) 682-7693
Email: marc.mattice@co.wright.mn.us
Fax: (763) 682-7313
Web: <http://www.co.wright.mn.us/department/parks/>

Through this program, the Department of Natural Resources (DNR) provides matching grants to local governments for acquisition of regional parkland outside the Twin Cities metropolitan area and for natural and scenic area land statewide. Specifically, these funds are to be used for a regional park grant to Wright County to begin to acquire lands for a proposed regional park on the Bertram Chain of Lakes in Wright County.

Project due to be completed: 6/30/2011
Work Program

Conservation Partners/Environmental Partnerships Matching Grant Program

[Back to top of page](#)

Subd. 3k \$150,000

Wayne Sames

MN Department of Natural Resources (DNR)
500 Lafayette Rd, Box 10
St. Paul, MN 55155

Phone: (651) 259-5559
Email: wayne.sames@state.mn.us
Fax: (651) 296-6047
Web: http://www.dnr.state.mn.us/grants/habitat/env_cons_part.html

Overall Project Outcome and Results

A total of seven projects were completed for a total grant amount of \$123,000. Five Conservation Partners habitat projects were completed for \$87,000. The projects included reforestation and invasive species removal in Coon Rapids Dam Regional Park; improving the aquatic ecology of a 130 acre shallow lake in Kandiyohi County; restoration of 1,300 feet of Minnesota River shoreline in Mankato; a 15 acre restoration of prairie, savanna and wetland in Ramsey County; and implementation of several lake shore conservation projects in Stearns County.

Two Environmental Partnership projects were completed for \$36,000. The projects involved implementation of innovative storm water management and interpretation at Square lake Regional Park and demonstration of innovative storm water management practices with environmental interpretation by the Washington County Conservation District.

Two projects originally awarded grants were withdrawn by the applicants.

Administration of the grants was completed by DNR local grants staff for a total of \$10,000. A summary of the funded projects is attached.

Project Results Use and Dissemination

Grant recipients are required to submit a final report on the project to the DNR. This information is maintained in the project file and is available on request. Some projects involve the development of informational signing, brochures, booklets, etc., that are made available to the public.

FINAL REPORT

Project due to be completed: 6/30/2010

County Trail System Design

Subd. 3I \$175,000

[Back to top of page](#)

Mary Vogel

University of Minnesota
151 Rapson Hall
89 Church St SE
Minneapolis, MN 55455

Phone: (612) 626-7417

Email: vogel001@umn.edu

Fax: (612) 626-7424

Web: <http://ccl.design.umn.edu/>

Overall Project Outcome and Results

Using a publicly engaged process involving citizens, county trail committees, local officials, and trail users, and building on the Center's previous state trail work, the Center for Changing Landscapes created designs/plans for individual county trail systems in Brown, Lyon, Redwood, and Renville Counties. While celebrating the region's and each county's environmental and cultural assets, the county-wide, community, district, and site scale plans/designs link the counties and the communities within them and connect to the existing city trails and the authorized state trails.

Project Goals:

- Create county trail plans/designs that promote recreation and environmental awareness and stewardship by addressing issues of environmental type, quality, and preservation along trail corridors and in the larger trail landscapes by preserving, enhancing, and interpreting natural and cultural landscape systems and features;
- Leverage the effectiveness of existing and planned recreational, natural, and cultural assets such as parks, trails, historic sites, conservation lands;
- Create community and county consensus around trail opportunities; and
- Create plans/designs for use to empower county trail funding from local and other sources.

Project Products:

- Community-focused and county-wide trail discussions: local input and critiques of plans/designs were given in over 25 public meetings with trail committees, citizens, and local officials;
- A printed and digital report that includes analyses of the landscape of the region and the four counties; 4 county trail system plans/designs; 49 county system routes through individual communities; 54 community trailhead locations; 19 community trailhead designs; 5 trailhead & special place designs; 5 county park trailhead designs; 4 signature element package that brand each county trail: logos, signs, kiosks, and rest areas; and a plan/design for the Chief Sleepy Eye Spur.

- Over 60 display boards of trail work for trail committee and larger public meetings
- Power point presentations for committee and public meetings

Plans are available for download at <http://ccl.design.umn.edu/publications.html>

Project Results Use & Dissemination

- Local media have publicized project meetings and the work. There have been newspaper articles, newsletter articles, radio interviews, and website postings.
- The plans/designs have been presented to and discussions held with county trail committees, park committees, city councils, and county boards.
- Plans/designs for Chief Sleepy Eye Spur were presented to the Minnesota Senate's Capitol Investment Committee and the House's Capitol Investment Finance Division.
- The work has been adopted including in the newly updated Southwestern Trail Plan and Lyon County's trail plan in its comprehensive plan.
- Plans are being made for a public meeting in September that will roll out all of the work in the four counties and set the stage for cooperation among the counties and for the development of a coordinated implementation strategy.
- Project results distributed to each county in both printed and digital form for their use and posted on LCCMR's and the Center for Changing Landscape's websites.

FINAL REPORT

Project completed: 6/30/2010

Accelerated Prairie Management, Survey, Acquisition and Evaluation

Subd. 3m \$1,250,000

[Back to top of page](#)

Carmen Converse

MN Department of Natural Resources (DNR)
500 Lafayette Rd, Box 25
St. Paul, MN 55155

Phone: (651) 259-5083

Email: carmen.converse@dnr.state.mn.us

Fax: 651) 296-1811

Web: <http://dnr.state.mn.us/eco>

Overall Project Outcome and Results (includes Use and Dissemination)

Minnesota's native prairie covered about 18 million acres at the time of the public land surveys (1847-1908); currently less than one percent remains. This multi-faceted prairie project was designed to increase conservation of native prairie and provide tools for long-term management and assessment of this rare resource. Project results addressed:

1. Rapid assessment of remaining native prairie;
2. Completion of the Minnesota County Biological Survey (MCBS) in six prairie counties;
3. Increased technical assistance to private prairie landowners;
4. Acceleration of management of public and private prairie lands;
5. Establishment of a baseline dataset for long-term status trend monitoring and analysis;
6. Acquisition of prairie bank easements.

Results:

1) Rapid Assessment: The effectiveness of a computerized procedure to detect changes in mapped prairies was explored in this result. Detailed feature extraction, segmentation, and change analysis procedures using the SPRING software was completed for 1,521 prairie/savanna sites identified by the MCBS prior to 1994. The total area assessed included 65,444 acres of prairie/savanna habitat in 32 counties and over 192,000 acres of surrounding "buffer" area. Statewide, the prairie habitat examined had a 4% change affecting 2,332 acres from 1991 to 2008. Prairie habitat outside of protected areas had significantly higher amounts of prairie loss or woody vegetation encroachment. A separate report, Accelerated prairie management, survey, acquisition and evaluation result 1: Rapid assessment of remaining native prairie was completed.

2) MCBS completed surveys in six counties. Less than 1,700 acres of prairie in these counties was recorded as compared to approximately 2,053,300 acres recorded in the late 1800's. The rarity of prairie species is largely due to prairie habitat loss and fragmentation. Rare plant populations were recorded at 281 new locations, including new distributional data on species such as Wild quinine and Valerian. Vegetation samples (relevés) were collected at 26 locations. A State Wildlife Grant for concurrent animal surveys resulted in 70 new records. Sites of high biodiversity significance such as the 15 acre Dexter Prairie were identified for protection as natural areas.

3) Technical assistance: DNR prairie specialists provided consultation regarding management and protection strategies for native prairies at eight public events and individually to 63 private landowners. Forty prairie stewardship plans were delivered to landowners.

4) Management: The Scientific and Natural Area program (SNA) prairie management activities resulted in 545 acres of woody plant removal, 2085 acres of prescribed burning, 2162 acres of exotic species treatments, and 84.5 acres of prairie reconstruction.

5) Status Trend Monitoring: A total of 683 vegetation transects, 42 relevés, and 1596 bird point counts were completed at 38 sites containing high quality prairie providing a baseline dataset for future proposed long-term monitoring and analysis on at least 35 sites. A separate report, Accelerated prairie management, survey, acquisition and evaluation result 5: Prairie monitoring and evaluation was completed.

6) Protection: SNA protected high quality prairies in Big Stone, Pipestone, Goodhue, and Fillmore counties through acquisition of five Native Prairie Bank conservation easements (totaling 476.2 acres) that provide habitat for species such as Greater Prairie Chicken, Chestnut-collared Longspur, Prairie bush clover and Plains wild indigo.

FINAL REPORT

Project completed: 6/30/2010

Prairie Ecosystem Restoration

Subd. 3n \$80,000

[Back to top of page](#)

Rich Perrine

Martin Soil and Water Conservation District
923 N State St, Ste 170
Fairmont, MN 56031

Phone: (507) 235-6680

Email: richard.perrine@mn.nacdnet.net

Fax: (507) 235-8171

Web: <http://www.martinswcd.net>

Overall Project Outcome and Results

This project's focus was to collect seed and plant materials from 50 species of local ecotype native plants from 50 vulnerable prairie remnants and then re-seed or plant them on 1,000 acres or more of protected easements. By increasing the plant diversity in our native prairies we aimed to improve their natural functions and provide a better habitat for our insects, birds, and mammals. Additionally, the seeds collected are being used as foundation seed and their origination followed according to MN Crop Improvement Association's (MCIA) "Yellow Tag" program.

Letters were received from 31 landowners and 18 County Townships giving us permission to conduct native plant inventories and then collect seed and plant materials. MCIA was contracted to perform site inspections, identification, and verification of native species in order for the seeds collected to maintain their "Yellow Tag" eligibility. We received an overwhelming response for us to plant on 1589 acres. Many properties had several areas in which we planted seed or seedling plugs which we successfully grew.

In June 2009 four interns were hired and put to work learning plant and seed identification and seed stratification requirements. Daily tasks included identifying prairie remnants or sites with local ecotype native species, planting trays, using GPS to mark species locations on large sites, placing no mow signs in selected ditches, shelling and cataloguing seed types and amounts collected. Seeds were collected from 104 different species of which 34 species could be considered at-risk for further decline.

Projects Results Use and Dissemination

Articles were published in Martin SWCD's Conservation Update and several radio spots were aired discussing this project to update county residents on our progress. We also set up information booths at various community events and we always had photographs and talked about what we were doing with the project.

FINAL REPORT RECEIVED - AWAITING REVISION

Project completed: 6/30/2010

[Back to top of page](#)

Best Practices for Native Prairie Management

Subd. 3o \$45,000

Michelle Snider

Minnesota Recreation and Park Association
200 Charles Street NE
Fridley, MN 55432

Phone: (763) 571-1305 x100**Email:** snider@mnrecpark.org**Fax:** (763) 571-5204**Web:** <http://www.mnrpa.org>

Overall Project Outcomes and Results

The 2004 LCMR Parks Study and the 2003-2008 State Comprehensive Outdoor Recreation Plan (SCORP) recommended better coordination among Minnesota's outdoor recreation providers. This project addressed these recommendations by engaging public and private outdoor recreation leaders to transform better coordination into shared knowledge and practices.

Two native prairie demonstration projects will identify best management practices and maintenance methodologies as the sites continue to mature. The first native prairie demonstration area is located within Cedar Creek Ecosystem Science Reserve in East Bethel, Minnesota. One-half of the area was mowed, and one-half was burned prior to seeding. This 23-acre demonstration area features five treatments: burn/broadcast seed; burn/drill seed; mow/broadcast seed; mow/drill seed; and forb plantings.

The second native prairie demonstration project is located within two city parks in Hutchinson, Minnesota. The two areas' objectives were to restore turf back to native prairie, and to further an oak savanna restoration. This approximately 10-acre demonstration area (total acreage within the two sites) features four treatments: drill seed near lowland river area; broadcast seed near high-ground river area; hand-seed; and over-seeding of a continued restoration project.

Three regional workshops were conducted to exchange information and techniques used during the demonstrations, and overall native prairie best practices. The first regional workshop focused on native prairie impacts, research, and reconnecting children to nature. Session content included biodiversity and its impacts on prairie ecosystems; bioenergy; climate; productivity and resistance to drought, disease, and pests; and reconnecting children with the native environment by teaching them the value of the native prairies, lands, and waterways.

The second regional workshop was designed to gather a cross-section of professionals to discuss strategies and solutions for best practices in native prairie management. Session content included best practices in native prairie management from numerous perspectives: engineering, wildlife, natural resources, park resources, and water resources. Workshop presenters also provided information on partnerships, stormwater program and vegetation, prairie maintenance, prairie seed installation, and forestry inventories.

The third regional workshop centered on small and large suburban native prairie areas. Session content included prairie and native plant/tree protection and restoration; and agricultural development that has been one of the largest sources of local habitat removal with current efforts to restore these prairies to their original native habitats. Workshop presenters also provided information on efforts to convert 600 acres of former agricultural land to native prairie and wetland.

Projects Results Use and Dissemination

The two demonstration areas were components of two of the regional workshops to share the site preparation, seed selection, and methodology information with participants. Project results have been provided within the Minnesota Recreation and Park Association's 2009 annual report, and Minnesota's state report during National Recreation and Park Association meetings.

Additionally, project updates are included on the Minnesota Recreation and Park Association's website and the best practices website. Further project results dissemination will be shared during Minnesota Recreation and Park Association educational conferences and trainings.

FINAL REPORT

Project completed: 6/30/2010

Impacts of Climate Change and CO2 on Prairie and Forest Production

Subd. 3p \$180,000

[Back to top of page](#)

Peter Reich

University of Minnesota
1530 Cleveland Ave N
St. Paul, MN 55108

Phone: (612) 624-4270

Email: preich@umn.edu

Fax: (612) 625-5212

Web: <http://www.forestry.umn.edu/people/facstaff/reich/>

RESEARCH

Biofuels from perennial plants could be an important part of Minnesota's energy future; however, much uncertainty surrounds the growth potential and carbon sequestration potential of different perennial biofuels, especially with respect to anticipated changes in climate and atmospheric chemistry over the next century. The University of Minnesota will accelerate research simulating future climate and atmospheric conditions to determine their impacts on biomass production, carbon sequestration, and water quality in prairie and tree species.

Project due to be completed: 6/30/2011

Work Program

Biofuel Production and Wildlife Conservation in Working Prairies

Subd. 3q \$500,000

[Back to top of page](#)

Clarence Lehman

University of Minnesota
100 Ecology Building, 1987 Upper Buford Circle
St. Paul, MN 55108

Phone: (612) 625-5734

Email: lehman@umn.edu

Fax: (612) 624-6777

Web: <http://www.cbs.umn.edu/eeb/faculty/LehmanClarence/>

RESEARCH

Biofuels are likely to be an important component of future energy production. Biofuel production in Minnesota and around the globe has the potential to either improve conditions for wildlife species or make conditions markedly worse. The University of Minnesota will identify and research management practices that promote wildlife conservation and associated habitat biodiversity on future working prairies used for renewable bioenergy production.

Project due to be completed: 6/30/2011

Work Program

Subd. 4 Water Resources**Future of Energy and Minnesota Water Resources**

Subd. 4a \$270,000

[Back to top of page](#)

Sangwon Suh

University of California - Santa Barbara
3422 Bren Hall
Santa Barbara, CA 93106-5131

Phone: (805) 893-7185

Email: suh@bren.ucsb.edu

RESEARCH**Overall Project Outcome and Results**

Minnesota's water resources are poised to undergo significant changes in the coming decades. For example, with new bioenergy policies aiming to reduce fossil fuel dependency, Minnesota has become one of the top five bioethanol producers in the United States in the past two decades. Bio-energy production, together with increasing population, energy demand, and climate uncertainties present a great challenge for water authorities seeking to sustainable future water supply. There is an urgent need to integrate an analysis of demands on Minnesota's water resources with scenarios of future energy production. This project aimed to envision Minnesota's temporal and spatial water schemes by 2030 in response to population, energy, and climate scenarios, by integrating a system dynamics model with geographic information system (GIS) data. We developed an integrated spatial model that analyzes the future of Minnesota's water budget with particular attention to changes in water demand under different scenarios. Key trends incorporated into the scenarios include (1) biofuel production (considering water needs for irrigation of the biofuel feedstock as well as for processing); (2) changes in the electricity grid mix considering Minnesota's Renewable Energy Standards; (3) demographic changes; and (4) climate change. Scenarios of water demand was combined with GIS mapping and water balance techniques, which can deliver spatially and temporally explicit water budget projections for each scenario.

The results indicate that population growth and increasing demand on electric power generation are two primary factors driving increasing future water demand in Minnesota. Water management should be coupled with urban development and planning to reduce water stress induced by population growth and electric power generation. Late summer and winter are two periods of time in which it is particularly challenging to support human demand of water without the potential of drawing down the water resources. This report produced by this project presents maps and regional monthly water availability graphs for various scenarios tested in this study. These system characteristics shown in the current scenario analysis can play an important part of future water conservation and management planning.

Project Results Use and Dissemination

The study results were presented in more than four national and international conferences hosted in the US and Portugal, in which a poster summarizing the findings of this study won the poster contest in the prestigious Gordon Research Conference in 2010. One paper was published in a high-impact journal, Environmental Science and Technology (ES&T) in 2009; the paper was one of the top-three most-cited and downloaded articles in September, 2009. Another, follow-up article has been submitted to the same journal and is currently under review. In 2008, a round-table forum was hosted at the University of Minnesota to discuss water sustainability modeling and its application. Scholars from state agencies, research institutes, and NGOs attended the forum to brainstorm feasible frameworks for assessing Minnesota's water future under different uncertainties. Detailed information of the presentations in this forum and relevant supporting information can be found at <http://www.iel.umn.edu/forum/waterforum.htm> PI. Suh is participating in a publication by the United Nations Environmental Programme (UNEP) on biofuel's water implication as an author based on the knowledge and findings gathered from this project. The publication is expected to be released in early 2010.

PROJECT PUBLICATION: The Future of Energy and Minnesota's Water Resources

FINAL REPORT

Project completed: 6/30/2010

Accelerating Plans for Integrated Control of the Common Carp

Subd. 4b \$550,000

[Back to top of page](#)

Peter Sorensen

University of Minnesota
1980 Folwell Ave
St. Paul, MN 55108

Phone: (612) 624-4997

Email: soren003@umn.edu

Fax: (612) 625-5299

Web: <http://fwcb.cfans.umn.edu/sorensen/>

RESEARCH

The common carp, first introduced and widely distributed across the United States in the late 1800s, is one of the most damaging invasive fish species in Minnesota and around the country. Common carp reduce food sources needed by native fish, stir up sediment and reduce water clarity, and harm underwater plants that maintain water quality and provide food and shelter for other fish. Various methods of control have proven either unsuccessful or environmentally damaging. These funds enable the University of Minnesota to continue, expand, and accelerate research into new and better options for controlling common carp by building upon major findings from a previous Environment and Natural Resources Trust Fund funded phase of this research [ML 2005, First Special Session, Chapter 1, Article 2, Section 11, Subd 5(g)], which identified

recruitment (i.e. the process by which newly hatched fish survive to a year in age) as a key weakness in the life history of the common carp.

Project due to be completed: 6/30/2011
Work Program

Testing Pesticides and Degradates in Public Drinking Water

[Back to top of page](#)

Subd. 4c \$368,000

John Hines

MN Department of Agriculture (MDA)
625 Robert St N
St Paul, MN 55155

Phone: (651) 201-6694

Email: john.w.hines@state.mn.us

Fax: (651) 201-6117

Web: <http://www.mda.state.mn.us/chemicals/pesticides/maace.aspx>

Overall Project Outcome and Results

Pesticides are known to impact Minnesota's groundwater and there are new pesticides being developed and registered for use every year. To ensure the safe use of new pesticides it is essential to measure the concentration and frequency of their detection in the state's water resources. In addition it is critically important, for proper pesticide management, to be able to analyze water samples for the compounds parent pesticides break down into. It is only through the precise measurement of extremely small quantities of pesticides in the state's water resources that impacts to human and ecological health may be determined.

Through this project the Minnesota Department of Agriculture (MDA) laboratory acquired the necessary analytical equipment and developed appropriate analytical methods for analyzing water samples for additional new generation pesticides and their degradates in groundwater and drinking water in Minnesota. The new equipment and related methods expanded the spectrum of compounds the MDA is able to detect in water samples, increased precision of water sample analysis, and improved the overall efficiency of water sample analysis at the MDA. Furthermore, the MDA laboratory is now capable of measuring many pesticides to levels of sub parts-per-trillion in a water sample. Measures of such precision will allow the MDA to manage pesticide use to keep concentrations below levels injurious to humans or the environment.

Prior to completion of this project the MDA was able to analyze water samples for 36 pesticide parent compounds and 11 breakdown products. The new methods are able to analyze samples for 88 parent pesticides and 22 breakdown products. Before the new methods were developed the lowest measurable value for a specific pesticide was between 50 and 1000 parts-per-trillion while the laboratory is now able to measure pesticide quantities between 0.8 and 50 parts-per-trillion, depending on the specific pesticide being measured.

Sample results for monitoring conducted by the MDA during winter and spring periods in 2010 are showing interesting results. A small number of pesticides never before discovered have been detected, albeit at very low concentrations. A clearer image of the occurrence of various pesticide breakdown products is also beginning to emerge and ongoing work should provide insight to the balance between pesticide parent and degradate detections in the state's water resources. These results will also allow the MDA to more precisely determine pesticide impacts to the water resources and aid in understanding the effectiveness of recommended BMPs and other pesticide management practices.

To the degree that time and lab resources allow, the equipment purchased and methods developed through this project will also be available for use by any future publicly funded projects at no cost except standard operating expenses.

Project Results Use and Dissemination

Immediately following successful development of the new methods the MDA laboratory analyzed 100 samples from public drinking water wells across the state. These wells were selected and sampled by the Minnesota Department of Health from the available community wells that are not typically included in the US-EPA Safe Drinking Water Act pesticide monitoring requirements. As of this report results are just becoming available. Results of the testing will be made available by the Department of Health following proper notification of the participating communities.

In addition to the one time sampling of the community wells, every sample collected by the MDA monitoring program for both surface water and groundwater will be analyzed with the new methods. The first results from the MDA monitoring program samples will be published in mid 2011 as part of the program's annual water quality monitoring data report. Development of the methods and analysis of samples utilizing the methods will also be reported to the US-EPA as part of the federal reporting requirements enabling the registration of pesticides for use in the state of Minnesota.

FINAL REPORT**Project completed:** 6/30/2010

Assessment of Riparian Buffers in the Whitewater River Watershed[Back to top of page](#)

Subd. 4d \$52,000

Megan Kranz-McGuireWhitewater Joint Powers Board
400 Wilson St, Box 39
Lewiston, MN 55952**Phone:** (507) 523-2171**Email:** megankm@charterinternet.com**Fax:** (507) 523-3717**Web:** <http://www.whitewaterwatershed.org>

Funds enable an effort in southeastern Minnesota led by the Whitewater Joint Powers Board that will assist in the prioritization of stream restoration efforts to improve water quality and habitat and in the enforcement of riparian buffers. An inventory of streams and adjacent land use and a survey of riparian landowners throughout the region will be conducted.

FINAL REPORT RECEIVED - CURRENTLY UNDER TECHNICAL REVIEW**Project completed:** 6/30/2010

Work Program

Intra-Lake Zoning To Protect Sensitive Lakeshore Areas[Back to top of page](#)

Subd. 4e \$125,000

Paul RadomskiMN Department of Natural Resources (DNR)
1601 Minnesota Dr
Brainerd, MN 56401**Phone:** (218) 833-8643**Email:** paul.radomski@dnr.state.mn.us**Fax:** (218) 828-6043**Web:** <http://www.dnr.state.mn.us>

Funds continue and expand a previous Environment and Natural Resources Trust Fund funded cooperative effort [ML 2007, Chap. 30, Sec. 2, Subd. 5(h)] between Cass County and the Department of Natural Resources (DNR) to identify sensitive shorelines on highest priority area lakes and implement innovative zoning practices to protect water quality and lakeshore habitat.

Project due to be completed: 6/30/2011

Work Program

Native Shoreland Buffer Incentives Program[Back to top of page](#)

Subd. 4f \$225,000

Erika RiversMN Department of Natural Resources (DNR)
1201 E Highway 2
Grand Rapids, MN 55744**Phone:** (218) 999-7914**Email:** erika.rivers@dnr.state.mn.us**Fax:** (218) 327-4263**Web:** <http://www.dnr.state.mn.us>

Shoreline buffers of native vegetation filter excess nutrients and pollutants from runoff and provide habitat. Across Minnesota, thousands of shoreline miles of native vegetation buffers have been stripped because landowners lacked understanding of the important ecological function of buffers and any incentive for maintaining them. These funds enable the Department of Natural Resources (DNR) to accelerate a native shoreland buffer incentive program through market research, technical assistance, and competitive matching grants of \$75,000 to local governments to craft and implement shoreland protection incentive programs that encourage maintaining and restoring native shoreland buffers.

Project due to be completed: 6/30/2011
Work Program

Southeast MN Stream Restoration Projects

[Back to top of page](#)

Subd. 4g \$240,000

Jeff Hastings

Trout Unlimited
E7740 Hastings Ln
Westby, WI 54667

Phone: (608) 606-4158
Email: jhastings@tu.org
Web: <http://www.tu.org/driftless>

Early European settlement and agricultural practices from the 1850's to the 1930's left a legacy of erosion, flooding, and alteration on coldwater streams in southeast Minnesota that is still negatively impacting those streams today. Funds enable Trout Unlimited to accelerate streambank stabilization and restoration on at least six miles of stream in southeast Minnesota while simultaneously building the capacity of area government agencies and private citizens to implement future stream restoration projects.

Project due to be completed: 6/30/2011
Work Program

South-Central MN Groundwater Monitoring and County Geologic Atlases

[Back to top of page](#)

Subd. 4h \$1,600,000

Part 1 (\$706,000)

Dale Setterholm

Minnesota Geological Survey
University of Minnesota
2642 University Ave. W.
St. Paul, MN 55114

Phone: (612) 627-4780
Email: sette001@umn.edu
Fax: (612) 627-4778
Web: <http://www.geo.umn.edu/mgs/>

Part 2 (\$894,000)

Jim Berg

MN Department of Natural Resources (DNR)
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 259-5680
Email: jim.berg@dnr.state.mn.us
Fax: (651) 296-0445
Web: <http://www.dnr.state.mn.us>

The Minnesota Geological Survey and the Department of Natural Resources (DNR) will continue their joint long-term effort of mapping the location, size, boundaries, and vulnerability of the state's groundwater to support wise use and protection of groundwater and other resources. In this phase of work, DNR will: 1) develop a plan for a statewide network of water level

monitoring wells, and 2) investigate physical and recharge characteristics of the Mt. Simon Aquifer - the deepest bedrock aquifer of south central Minnesota and the Twin Cities metro area. In this phase of work, Minnesota Geologic Survey will: 1) initiate atlases in Blue Earth, Le Sueur, and Nicollet counties, and 2) provide processing and analysis support for the DNR's drilling work.

Project due to be completed: 6/30/2011

Work Program - Dale Setterholm

Work Program - Jim Berg

Lake Superior Research

Subd. 4i \$86,000 (GLPA)

[Back to top of page](#)

Steve Colman

University of Minnesota
Large Lakes Observatory, UMD
2205 E. 5th St.
Duluth, MN 55812

Phone: (218) 726-8522

Email: scolman@d.umn.edu

Fax: (218) 726-6979

Web: <http://www.d.umn.edu/llo>

RESEARCH

Overall Project Outcome and Results

There is a surprising lack of study and understanding of the ecosystems of the Great Lakes and their properties, especially in the deepwater basins. We know more about many marine systems than we know about the Great Lakes. With current concerns about the environmental health of the Great Lakes, studies supported through this project aimed to contribute to alleviating some of the unknowns. A series of studies were conducted that research the condition, functioning, and processes of Lake Superior, its sediments, and its ecosystem including:

- Studies related to the entire living ecosystem, from top predator fish down to picoplankton.
- Studies of the circulation of the lake using numerical models and oceanographic instrumentation.
- Studies of the water column including the balance between CO₂ production and oxygen consumption, the processes related to the fate of organic matter and nutrients, and the effect of these and other water column processes on primary producers.
- Studies of the transport and delivery of organic and inorganic materials to the lake floor as sediments that accumulate in deep waters of the lake and the erosion, transport, and storage of coarse-grained sediment in coastal waters.

In all of these studies, we took a holistic, "physics to fish" approach, examining the interactions between physical and biological processes.

We conducted a total of 24 field projects, with project funds going primarily to the cost of using of our research ship for an aggregate of 53 days at sea. Project funds leveraged other funding as most of these studies were small pilot projects, extensions to projects funded from other sources, and projects to collect preliminary data often required for proposals to the national science agencies. The projects have a common theme of understanding the dynamics of Lake Superior, its sediments, and its ecosystem. Through these studies, we hope to provide Minnesotans, from lay citizens to environmental managers, a better understanding of how Lake Superior works and how it might change in response to climate change and human activity.

Project Results Use and Dissemination

We have now collected a wealth of environmental data for Lake Superior. A significant part of those data have already been used for larger research proposals to the National Science Foundation and other agencies, some of which have already been successful in bringing new federal funding into the state. Plans are for the results of studies supported through this project to be published in peer-reviewed journals where they will be available to Minnesota managers and regulators. With other funding, we are in the process of developing a system called the Global Great Lakes Data and Modeling Center, which will allow incorporation and assimilation of existing data, new data like those collected in this project, and ongoing real-time observational data. The Data and Modeling Center will allow numerical models to be run and compared in real time using the different data sets and make all data readily available through an internet interface.

FINAL REPORT

Project completed: 10/31/2009

Subd. 5 Natural Resource Information

Updating the National Wetlands Inventory for Minnesota[Back to top of page](#)

Subd. 5a \$550,000

Doug Norris

MN Department of Natural Resources (DNR)
500 Lafayette Rd, Box 25
St. Paul, MN 55155

Phone: (651) 259-5125**Email:** doug.norris@dnr.state.mn.us**Fax:** (651) 296-1811**Web:** <http://www.dnr.state.mn.us/eco/wetlands/index.html>

Wetland inventories are an essential tool for effective wetland management, protection, and restoration. The data is used at all levels of government, as well as by private industry and non-profit organizations, for wetland regulation and management, land use and conservation planning, environmental impact assessment, and natural resource inventories. The original National Wetland Inventory for Minnesota is outdated and updating the data for Minnesota has been identified as an important priority. Funds enable the DNR to begin a multi-phase process of updating the National Wetland Inventory statewide.

Project due to be completed: 6/30/2011

Work Program

Soil Survey[Back to top of page](#)

Subd. 5b \$400,000

Megan Lennon

MN Board of Water and Soil Resources (BWSR)
520 Lafayette Road North
Saint Paul, MN 55155

Phone: (651) 296-1285**Email:** megan.lennon@state.mn.us**Fax:** (651) 297-5615**Web:** <http://www.bwsr.state.mn.us>**Overall Project Outcome and Results**

Accurate soils information is essential for evaluating the potential for land to support development, crop and forest production, and for identifying the most suitable locations for conservation practices and other land uses. Readily accessible local soil information is critical to informing conservation decisions and provides a foundation for sustainable land use planning. The soil survey is the mechanism for how this basic natural resource information is made available to land use authorities and landowners to make the best land use decisions.

In the ongoing, multi-year project to map, classify, interpret, and Web-publish an inventory of the soils of Minnesota, this one-year phase of the project focused on accelerating the completion of a Statewide soil survey, increase soil mapping in targeted areas, and enhancing soils data through increased sample collection, availability, and interpretation. Specifically:

1. 71,000 acres mapped in Crow Wing County;
2. 32,000 acres mapped in Pine County;
3. 85,000 acres mapped in Koochiching County;
4. 80,000 acres mapped in the Crane Lake subset of St. Louis County;
5. Data from 1,000 soil samples (some dating back to the 1970's) were interpreted for the first time and incorporated into Soil Surveys for many Minnesota counties;
6. Landuse effects on soil carbon were determined on 118 sites in 14 counties throughout the State, this data can be used to develop soil carbon management guidance.

The soil survey project was extremely successful and many of the mapping goals were exceeded. Mapping surpassed initial acreage goals in both Crow Wing and Pine Counties, and the soil surveys for Koochiching and St. Louis Counties were completed 1 year ahead of schedule. A report detailing the results of re-analysis of lab samples from the 1970's highlighting landuse impacts on soil carbon will be available in January 2011.

Project Results Use and Dissemination

The Soil Survey project funded by the Minnesota Environment and Natural Resources Trust Fund is highlighted as a BWSR feature project (www.bwsr.state.mn.us/projects/soil_survey.pdf) on the Agency's homepage. All the data, mapping information, and interpretations are available on the Web Soil Survey as a user-friendly, GIS-based application. Web Soil Survey provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world.

FINAL REPORT

Project completed: 6/30/2010

Updating Precipitation Intensities for Runoff Estimation and Infrastructure Designs[Back to top of page](#)

Subd. 5c \$100,000

Bruce Wilson

MN Pollution Control Agency (PCA)
520 N Lafayette Rd
Saint Paul, MN 55155

Phone: (651) 282-2619

Email: bruce.wilson@state.mn.us

Fax: (651) 297-8337

Web: <http://www.pca.state.mn.us>

Accurate estimates of rainfall intensities and duration are necessary for detection of climate change and related consequences for natural resources management and infrastructure design efforts. Most existing estimates are based on data that has not been updated since 1961, and which is believed to not reflect current rainfall patterns as altered by climate change. Funds enable the Pollution Control Agency to participate in a multi-state cooperative effort with the National Oceanic and Atmospheric Administration to obtain updated climate change related rainfall frequencies. This data will have broad application for storm water conveyance and infrastructure design throughout Minnesota.

Project due to be completed: 6/30/2011

Work Program

The MN Breeding Bird Atlas[Back to top of page](#)

Subd. 5d \$270,000

Part 1 (\$169,000)**Mark Martell**

Audubon Minnesota
2357 Ventura Dr, Ste 106
St. Paul, MN 55125

Phone: (651) 739-9332

Email: mmartell@audubon.org

Fax: (651) 731-1330

Web: <http://www.mnbba.org/>

Part 2 (\$101,000)**Gerald Niemi**

Natural Resources Research Institute (NRRI) - University of Minnesota
5013 Miller Trunk Hwy
Duluth, MN 55811

Phone: (218) 720-4270

Email: gniemi@nrri.umn.edu

Fax: (218) 720-4328

Web: <http://www.mnbba.org/>

PART 1: AUDUBON MINNESOTA

Overall Project Outcome and Results

These were the first 2-years of an anticipated six-year effort which will result in a comprehensive, statewide survey documenting the breeding distribution of all species of birds in Minnesota. After six years the final atlas products will include the publication of a book and an interactive on-line atlas, both with detailed distribution maps, data on species breeding status, and a summary of data from other surveys. Full access to the information will be provided to the public as well as conservation agencies and organizations.

The first two years of the project, focused on project development, volunteer recruitment, establishment of a data management system, and 2 seasons of data collection. This is a statewide multi-partner project overseen and advised by steering and technical committees. One full-time and one part-time temporary project staff were hired during this period and were assisted by 30 volunteer coordinators overseeing 638 volunteer surveyors. Written materials, workshops, and field sessions were used to recruit and train participants in the project. A data access and information website was established (<http://www.mnbba.org>) and we contracted with Cornell University to adapt their web-based data entry, management, and reporting system (the e-bird database) to our project (<http://bird.atlasing.org/Atlas/MN/Main?cmd=Start>). The MNBBA website and the Cornell database are linked and complement each other.

Each Township in the state is divided into 4 "blocks" with one block (usually the NE) designated as the "priority block". Data collection began in spring of 2009 and by the end of the six-year project will include every one of the approximately 2,120 Township in Minnesota. An all-species, volunteer driven survey, and a separate specialized "point count" survey (overseen by NRRRI) will be conducted in each of townships across the state. By June 30, 2010 data had been entered into our database from 2,076 survey blocks. The 638 volunteers reported spending 6,939 hours doing surveys. A total of 48,425 individual sightings were submitted on 238 species.

Project Results Use and Dissemination

Results from the Breeding Bird Survey are updated daily and available on our website at <http://www.mnbba.org>. Further analysis and dissemination of the data will be available at the conclusion of the project at the end of year 6 or 7. To date the Minnesota Breeding Bird Atlas has received coverage in a number of newspapers statewide and various organizational publications and newsletters.

FINAL REPORT

Project completed: 6/30/2010

PART 2: NRRRI

Overall Project Outcome and Results

This project is the first two-years of an anticipated six-year effort in the development of the Minnesota Breeding Bird Atlas - the first-ever comprehensive survey of Minnesota's breeding birds. The overall project is divided into two parts - 1) volunteer observations organized by Audubon Minnesota and 2) systematic surveys of Minnesota's breeding birds organized by the University of Minnesota (summarized here). Because of the vastness of Minnesota, both of these efforts are necessary and complementary. Objectives of this portion of the project were to gain uniform statewide coverage for all of Minnesota's birds, estimate breeding bird populations by habitat type, and contribute to a nationwide network of bird atlases in the United States. The first two years of this project focused on the experimental design to sample all townships in Minnesota over a five-year period, an interactive data entry system, data gathering using standard 10-minute point counts, and a brief data summary. Data gathering was primarily completed by graduate and undergraduate students at the University of Minnesota, Duluth and Twin Cities campuses. All were required to pass a test of 80 bird songs, verify their hearing ability, and participated in field standardization exercises.

Over the two breeding seasons (2009 and 2010) covered by this project, the target of 40% of Minnesota townships (>920) was sampled. We observed over 200 species of birds and counted over 78,000 individual birds during the first two years of these efforts in over 950 townships and in over 2800 individual point counts. In addition, all bird censusers contributed thousands of observations to the volunteer data base in the complementary study organized by Audubon Minnesota, including over 4,000 probable or confirmed breeding records for Minnesota birds. Over 98 % of the data gathered in 2009 and 2010 have been entered and error checked.

Project Results Use and Dissemination

These data will be downloaded to the Minnesota breeding bird atlas during the fall of 2010 through the Cornell University interface. All of these data will be incorporated into a comprehensive atlas of Minnesota's breeding birds that will be used as 1) a first-ever baseline on the current population status of this important Minnesota resource, 2) critical information for future conservation planning, and 3) as a guide for such activities as identifying important bird areas or for nature-based tourism activities.

FINAL REPORT

Project completed: 6/30/2010

Restorable Wetlands Inventory

[Back to top of page](#)

Subd. 5e \$245,000

Darin Blunck

Ducks Unlimited, Inc.
1 Waterfowl Way
Memphis, TN 38103

Phone: (901) 758-3788

Email: dblunck@ducks.org

Fax: (701) 355-3575

Web: <http://www.ducks.org>

Overall Project Outcome and Results

The Restorable Wetlands Inventory (RWI) is a complement to the National Wetlands Inventory (NWI) completed in late-1980s by the U.S. Fish & Wildlife Service. An administrative decision was made developing the original NWI not to map wetland basins in Minnesota identified as completely drained. The number and acreage of completely drained wetlands that were not mapped by the NWI process is significant.

The RWI project identifies and digitizes the completely-drained depressional wetlands that were not mapped by the NWI process. Restorable wetlands mapping is based upon protocols established for NWI allowing seamless integration of the two datasets.

In the Southwest Prairie Complex, over 300,000 individual restorable wetland basins were identified and mapped. Upon completing the Southwest Prairie Complex mapping, townships in 42 western and south-central counties in the prairie and transition zone eco-regions of Minnesota have been mapped, adding an important component to the State's spatial data infrastructure that informs environmental planning and research. Through this investment in RWI - combined with the National Wetlands Inventory, landcover classifications, and a growing catalogue of high-resolution elevation data - our capacity to understand (and importantly, restore and manage) Minnesota's wetland resources is continuing to improve.

Project Partners were the LCCMR, Ducks Unlimited, Inc., and the U.S. Fish and Wildlife Service. The photo-interpretation and digitization work was contracted to the GIS Lab at South Dakota State University.

Project Results Use and Dissemination

The Restorable Wetlands Inventory mapping product for the Southwest Prairie Complex is complete and will be distributed on the Minnesota Data Deli and Ducks Unlimited, Inc. websites by the end of August 2010 in GIS-compatible formats.

Attached are maps showing mapping extent of the current M.L. 2008 appropriation and the cumulative RWI mapping effort.

FINAL REPORT

Project completed: 6/30/2010

Wildlife Disease Data Surveillance and Analysis

[Back to top of page](#)

Subd. 5f \$100,000

Patrick Redig

University of Minnesota
1920 Fitch Ave
St. Paul, MN 55108

Phone: (612) 624-4969

Email: redig001@umn.edu

Fax: (612) 624-8740

Web: <http://www.theraptorcenter.org>

RESEARCH

Overall Project Outcome and Results

Wildlife is an integral part of the complex interrelationship between human, animal, and environmental health, yet there is no centralized system for collection of wildlife health data. The study of wildlife health is limited by the logistics and expenses involved with sample acquisition. Wildlife rehabilitation centers represent an untapped resource as they admit a larger number of wild animals with a greater variety of species than any other resource.

This project developed a centralized database for tracking morbidity and mortality of wildlife seen in wildlife rehabilitation centers in Minnesota. A central goal was the development of standardized terminology, a critical step in the ability to integrate data from multiple rehabilitation centers. Initially, a survey was designed and distributed to ascertain current practices for clinical wildlife health data management. Next, a series of workshops was held with experts in the field of wildlife health to define data sets for signalment, animal recovery information, cause of admission and initial clinical signs. The animal recovery and signalment descriptors were used to integrate 10 years of historical data from Minnesota's two largest wildlife rehabilitation facilities. This established baseline data for normal patterns of wildlife admissions and created a preliminary GIS and web-based information system. A pilot project involving six wildlife hospitals focusing on avian species susceptible to lead poisoning, was begun to evaluate the functionality of the circumstances of admission, clinical signs and pathophysiological diagnosis terminology. This project is ongoing.

The results of this project were instrumental in the creation of a template for wildlife health data reporting and the development of a system for surveillance of wildlife health issues. This information will be important for wildlife conservation projects, wildlife management, disease surveillance, and as an indicator of ecosystem health. The data can be accessed through the new web site, <http://wildlifedisease.nbio.gov/cwhil/>, or by contacting The Raptor Center.

Project Results Use and Dissemination

The information resulting from this project has already been used to inform the development of a wildlife health reporting system being developed by the Wildlife Center of Virginia and to be distributed to wildlife rehabilitation centers around the country. A secondary outcome of this project, the development of a collaborative group called the Clinical Wildlife Health Initiative, has resulted in the expansion of this work to a national level. Discussions are underway on the potential use of this information in the United States Fish and Wildlife Service permitting process for rehabilitation center reporting, as well as the use of the new system for long-term monitoring at rehabilitation centers along the Gulf Coast as a result of the Deepwater Horizon Oil Spill.

FINAL REPORT

Project completed: 6/30/2010

Conservation Easement Stewardship, Oversight and Maintenance

[Back to top of page](#)

Subd. 5g \$180,000

Kevin Lines

MN Board of Water and Soil Resources (BWSR)
520 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 297-8025

Email: kevin.lines@bwsr.state.mn.us

Fax: (651) 297-5615

Web: <http://www.bwsr.state.mn.us>

Funds enable the Board of Water and Soil Resources (BWSR) to enhance long-term stewardship, oversight, and maintenance of conservation easements held by BWSR.

Project due to be completed: 6/30/2011

Work Program

Conservation Easement Stewardship and Enforcement Program Plan

[Back to top of page](#)

Subd. 5h \$520,000

Kathy Lewis

MN Department of Natural Resources (DNR)
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 259-5404

Email: kathy.lewis@dnr.state.mn.us

Fax: (651) 296-6047

Web: <http://www.dnr.state.mn.us>

Co-Project Manager

Susan Damon

MN Department of Natural Resources (DNR)

500 Lafayette Rd

St. Paul, MN 55155

Phone: (651) 259-5961

Email: susan.damon@dnr.state.mn.us

Web: <http://www.dnr.state.mn.us>

Funds enable the Department of Natural Resources (DNR) to inventory and digitize conservation easements held by DNR and to prepare a plan for long-term stewardship, monitoring, and enforcement of those easements.

Project due to be completed: 6/30/2011

Work Program

Subd. 6 Environmental Education

Waters of Minnesota Documentary on Watersheds

Subd. 6a \$349,000

[Back to top of page](#)

Barbara Coffin

Bell Museum of Natural History - University of Minnesota

10 Church St SE

Minneapolis, MN 55455

Phone: (612) 624-4986

Email: bcoffin@umn.edu

Fax: (612) 626-7704

Web: <http://www.bellmuseum.org/>

Overall Project Outcome and Results

The documentary film that resulted from this project, *Troubled Waters: A Mississippi River Story*, examines our relationship to the Mississippi River and its surrounding watershed through the competing interests of food, fuel, and environment. Excess nitrogen and phosphorus, fertilizers essential to the growth of plants, are contaminating the nation's rivers, lakes, and aquifers at the same time as precious soils wash away. The film tells the complex story of these troubled waters, both here in Minnesota and downstream as far away as the Gulf of Mexico, and highlights innovative solutions, such as high-tech farmers that practice precision agriculture and conservation farming methods; cattle farming while maintaining perennial cover on the landscape; and new technologies that hold water back on the land. Farmers, scientists, and entrepreneurs offer new ideas for meeting the goals of an ambitious, food-producing nation while ensuring the long-term health and sustainability of one of its most precious resources: the Mississippi River and its watershed.

Engaging, serious, and hopeful documentary video has proven to be an innovative and effective environmental education tool that reaches a broad audience of students and adults. Following the successful model of the recent Emmy award-winning television series *Minnesota: A History of the Land*, this new documentary will be broadcast on public television and be available in DVD format for local distribution.

Project Results Use and Dissemination

Troubled Waters: A Mississippi River Story will be broadcast on Twin Cities Public Television. Subsequent broadcasts are planned for the Minnesota Channel. Public television stations along the length of the Mississippi River will have the opportunity to air the film. A public premiere screening event is planned for October 3, 2010. The documentary is available in professional quality DVD format for educational uses. The DVD will be distributed to Mississippi River venues (e.g. the National Mississippi River Museum & Aquarium and Mississippi National River and Recreation Area Interpretive Center).

View "**Troubled Waters: A Mississippi River Story**" online for free on the Twin Cities Public Television website.

FINAL REPORT

Project completed: 6/30/2010

Global Warming - Reducing Carbon Footprint of Minnesota Schools[Back to top of page](#)

Subd. 6b \$750,000

William Sierks

MN Pollution Control Agency (PCA)
520 N Lafayette Road, Ste. 200
Saint Paul, MN 55155

Phone: (651) 757-2722**Email:** bill.sierks@state.mn.us**Fax:** (651) 215-0246**Web:** <http://www.pca.state.mn.us>

Funds will be used by the Pollution Control Agency (PCA) to provide information and technical assistance and to enact a grant program designed to help high schools, colleges, and universities to play a key role in addressing climate change. Up to 100 schools statewide will receive guidance and assistance identifying their carbon footprints and developing and implementing plans to reduce carbon emissions.

Project due to be completed: 6/30/2011

Work Program

Subd. 7 Establishment of an Emerging Issues Account[Back to top of page](#)**Emerging Issues Account**

Subd. 7 \$155,000

Susan Thornton, Director

LCCMR
100 Rev. Dr. Martin Luther King Blvd.
Rm 65 State Office Bldg
St. Paul, MN 55155

Phone: (651) 296-2406**Email:** susan.thornton@lccmr.leg.mn**Fax:** (651) 296-1321**Web:** <http://www.lccmr.leg.mn>

Funds will be used by the LCCMR to provide assistance for an unexpected, urgent, or emergency need where time is of the essence, as authorized in Minnesota Statutes, section 116P.08, subdivision 4, paragraph (d).

WENT TO:

Statewide Ecological Ranking Conservation Reserve Program (CRP) and Other Critical Lands - \$155,000 (completion date for this portion is 6/30/2010)

Other funds include:

M.L. 2007, Chp. 30, Sec. 2, Subd. 7 "Emerging Issues Account" - \$13,000 (completion date for this portion is 6/30/2009)

M.L. 2009, Chp. 143, Sec. 2, Subd. 4g "Statewide Ecological Ranking of Conservation Reserve Program (CRP) and Other Critical Lands" - \$107,000 (Project due to be completed: 6/30/2011)

Project due to be completed: 6/30/2011

2007 PROJECTS

MN Laws 2007, Chapter 30, Section 2 (beginning July 1, 2007)

NOTE: For all projects, contact us to obtain the most up-to-date work programs for current projects (project updates are required twice each year) or the final reports of completed projects.

The following documents are short abstracts for projects funded during the 2007 Legislative Session. The final date of completion for these projects is listed at the end of the abstract. When available, we have provided links to a projects web site. The sites linked to this page are not created, maintained, or endorsed by the LCCMR office or the Minnesota Legislature.

Subd. 3 LCCMR and Contract Administration

Subd. 4 Land

Subd. 5 Water Resources

Subd. 6 Natural Resource Information

Subd. 7 Establishment of an Emerging Issues Account

Subd. 3 LCCMR and Contract Administration

3a Legislative-Citizen Commission on Minnesota Resources

3b Contract Administration

Subd. 4 Land

4a Forest Legacy Conservation Easements

4b Minnesota's Habitat Corridors Partnership - Phase IV

4c Metro Conservation Corridors (MeCC) - Phase III

4d Prairie Stewardship Assistance for Private Landowners

4e State Parks and Trails Land Acquisition

4f Metropolitan Regional Park System Land Acquisition

4g Non-Metropolitan Regional Parks and Natural Scenic Area Acquisition

4h LAWCON Federal Reimbursement

4i Biological Control of European Buckthorn and Garlic Mustard - **RESEARCH**

4j Neutralization of Reed Canary Grass Root Exudates - **RESEARCH**

Subd. 5 Water Resources

5a Local Water Management Matching Challenge Grants

5b Protection of Rare and Unique Rock Outcrop Wetlands

5c Land Retirement Effects on Minnesota River Basin Streams - **RESEARCH**

5d Demonstrating Benefits of Conservation Grasslands on Water Quality - **RESEARCH**

5e Improved River Quality Monitoring Using Airborne Remote Sensing - **RESEARCH**

5f Evaluating Riparian Timber Harvesting Guidelines: Phase 3 - **RESEARCH**

5g Innovative Springshed Mapping for Trout Stream Management - **RESEARCH**

5h Intra-Lake Zoning to Protect Sensitive Lakeshore Areas

5i Water Resource Sustainability - **RESEARCH**

5j County Geologic Atlas Program Acceleration

5k Minnesota's Water Resources: Impacts of Climate Change - Phase II - **RESEARCH**

5l Pharmaceutical and Microbiological Pollution - **RESEARCH**

5m Threat of Emerging Contaminants to Upper Mississippi Walleye - **RESEARCH**

5n Cedar Creek Groundwater Project using Prairie Biofuel Buffers

5o Pyrolysis Pilot Project

Subd. 6 Natural Resource Information

6a Minnesota County Biological Survey

6b Soil Surveys

6c Field Guide for Evaluating Vegetation of Restored Wetlands

6d For Analysis and Implementation of Critical State Natural Resource Data Collection and Mapping

Subd. 7 Establishment of an Emerging Issues Account

Funding Sources: (**note: all projects are TF, unless otherwise noted)

Environment and Natural Resources Trust Fund (TF)

State Land and Water Conservation Account (LAWCON)

Subd. 3 Administration

Legislative-Citizen Commission on Minnesota Resources[Back to top of page](#)

Subd. 3a \$1,278,000

John Velin, Director

LCCMR

100 Rev. Dr. Martin Luther King Blvd.

Rm 65 State Office Bldg

St. Paul, MN 55155

Phone: (651) 296-2406**Email:** lccmr@lccmr.leg.mn**Fax:** (651) 296-1321**Web:** <http://www.lccmr.leg.mn>

This funding provides for two years of the administration of the LCCMR, its project proposal and recommendation process, and the contract management and project reporting of Trust Fund funded projects. Since 1963, the program that LCCMR is a legacy of has played a foundational role in the appropriation of over \$550 million to more than 1,250 projects directly benefiting Minnesota's environment and natural resources.

Project completed: 6/30/2009

Contract Administration[Back to top of page](#)

Subd. 3b \$40,000

Bill Becker

DNR

500 Lafayette Rd

St. Paul, MN 55155

Phone: (651) 296-3093**Email:** bill.becker@dnr.state.mn.us**Fax:** (651) 296-6047**Web:** <http://www.dnr.state.mn.us>

For agency Contract Administration

This funding provides for one year of the monetary administration and accounting of Trust Fund appropriations to projects by non-state entities.

Project completed: 6/30/2009

Subd. 4 Land

Forest Legacy Conservation Easements[Back to top of page](#)

Subd. 4a \$2,000,000

Richard Peterson

DNR

1810 30th Street NW

Faribault, MN 55021

Phone: (507) 333-2012**Email:** richard.peterson@dnr.state.mn.us**Fax:** (507) 333-2008**Web:** <http://www.dnr.state.mn.us>**Overall Project Outcome and Results**

The Blufflands landscape of southeastern Minnesota has been identified by the Department of Natural Resources as an important area for conservation. The mix of forest, bluff prairies, and rivers provides habitat for numerous rare and declining

species as well as many common species, and the oak forests are an important source of hardwood logs for area sawmills. Conserving and protecting large blocks of priority forest habitat through working forest conservation easements is a cost effective method to protect forests in an area where nearly 90% of the land is in private ownership.

The goal of this project was to identify and protect the highest priority parcels with working forest conservation easements. All applications were reviewed and ranked according to program ranking criteria (project size, location, forest quality, adjacency to public land, etc). Five applicants from a group of seventeen applicants were selected and appraisals were completed and certified during 2009 and 2010.

Two projects were completed and closed in December 2009, two in June 2010 and the final project closed in October 2010. A total of 1911.61 acres of private forestland and associated habitats in southeastern Minnesota were protected at an average cost of about \$1,055/acre. Total funds expended were \$2,017,454.4 and includes \$1,975,724 from the Environment and Natural Resources Trust Fund and \$41,730.4 from Capital Bonding.

The easements will be held by the State of Minnesota, Department of Natural Resources and monitored on a regular basis beginning in 2011.

These five projects are strategically located or nearby other publicly protected lands and these acquisitions help maintain larger blocks of deciduous forest adjacent or nearby public forests and buffer the publicly owned forest land and provide habitat linkages between publicly owned lands. They also contain productive forest resources of predominantly native forest species that have not been subject to any extensive development and which provide valuable habitat for a diversity of wildlife species.

Project Results Use and Dissemination

Project information will be reported in the Forest Legacy Information System for projects used to provide matching funds for the Koochiching Forest Legacy Project which was completed during this Project period. Project information has been used in a recent StarTribune graphic included in a December 15, 2010 article on the forest legacy program accomplishments.

Minimum Standards and Guidelines for State Forest Legacy Easements in Minnesota (pdf file)

FINAL REPORT

Project completed: 6/30/2010

Minnesota's Habitat Corridors Partnership - Phase IV

Subd. 4b \$4,200,000

[Back to top of page](#)

Matt Holland

Pheasants Forever, Inc
679 W River Dr
New London, MN 56273

Phone: (320) 354-4377

Email: mholland@pheasantsforever.org

Fax: (320) 354-4377

Web: <http://www.mnhabitatcorridors.org>

Overall Project Outcome and Results:

Between 7/1/07 and 6/30/09, Minnesota's Habitat Conservation Partnership (HCP) restored, enhanced or protected a total of 32,334 in defined project areas using \$16,011,693. This consisted of 17,650 acres with \$4,121,730 from the Environment and Natural Resources Trust Fund (ENRTF) and 14,684 acres with \$11,889,963 in leveraged funds. See the Final Report posted below or go to <http://www.mnhabitatcorridors.org> for complete information.

Partners restored/enhanced a total of 27,556 acres (16,788 acres ENRTF; 10,768 acres Other Funds) at a cost of \$3,460,895 (\$1,180,184 ENRTF, \$2,280,711 Other Funds). Total acres exceeded the proposed HCP-Phase IV goal of 6,398 acres due to increased non-state funding being spent upon easement restoration projects during the grant period. Work included 14,610 acres of grassland restoration/enhancement, 7,547 acres of wetland restoration, 91 acres of woodland restoration, 1,040 acres of wetland enhancement, 496 acres of dam modification, 115 acres of shoreline restoration, and 29 acres of wild rice restoration. Other accomplishments included shallow lake surveys, lake aeration, site access/development, and lakescaping demonstration projects/workshops.

Partners acquired a total 3,926 acres (375 acres ENRTF; 3,551 acres Other Funds) of perpetual conservation easements at a cost of \$9,448,237 (\$910,784 ENRTF, \$8,537,453 Other Funds). HCP fell shy of the proposed HCP-Phase IV goal of 4,320

acres due to increased nonstate funds being used for habitat restoration activities on easements. Shoreline habitats continued to be a priority for HCP partners working on easement, with over 8.6 shoreline miles protected. Habitats protected were grasslands, wetlands, and woodlands.

Partners acquired a total of 852 acres (487 acres ENRTF; 365 acres Other Funds) in fee-title at a cost of \$2,931,662 (\$1,857,8078 ENTF, \$1,063,800 Other Funds). HCP fell short of the proposed HCP-Phase IV goal of 1,254 acres due to land prices being high, the focus on shoreline (higher priced lands), and other fund projects falling through. HCP achieved 408 acres of new Wildlife Management Areas (WMA), 136 acres of Aquatic Management Areas (AMA), 78 acres of Wildlife Production Areas (WPA), and 230 acres of private/local government lands.

HCP Partners included: Ducks Unlimited; Fond du Lac Reservation; Leech Lake Band of Ojibwe; MN Deer Hunters Association; MN Department of Natural Resources; MN Land Trust; MN Valley National Wildlife Refuge Trust, Inc; National Wild Turkey Federation; Pheasants Forever; The Nature Conservancy; Trust for Public Land; U.S. Fish and Wildlife Service; U.S. Natural Resources Conservation Service.

COMPLETE OVERALL FINAL REPORT

Abstracts and Reports of Individual Partner Projects - available online at: http://www.lccmr.leg.mn/all_projects/2007_projects.html#20074b

- 0x Overall Summary of HCP - Phase IV
- 1a Project Coordination and Mapping (Pheasants Forever)
- 1b Restorable Wetlands Inventory (Ducks Unlimited)
- 2a Hides for Habitat Restoration (Minnesota Deer Hunter Association)
- 2b Partners for Fish and Wildlife (U.S. Fish and Wildlife Service)
- 2c Living Lakes Enhancement (Ducks Unlimited)
- 2d Shallow Lakes Assessment and Management (DNR)
- 2e2 Shallow Lake Impoundment and Management (Leech Lake Band of Ojibwe)
- 2e3 Wild Rice Habitat Restoration (Fon du Lac Band of Chippewa)
- 2g Wildlife Areas Management (DNR)
- 2h Fish Habitat Restoration (DNR)
- 2i Set out Seedlings (National Wild Turkey Federation)
- 2j Lakescaping (DNR)
- 2k Prairie Management (DNR)
- 2n Campaign for Conservation - Restoration (The Nature Conservancy)
- 2o Working Lands Initiative (U.S. Fish and Wildlife Service)
- 3a Shorelands Protection Program (Minnesota Land Trust)
- 3c Shallow Lakes Easements (Ducks Unlimited)
- 3d Wetlands Reserve Program (Ducks Unlimited and U.S. Natural Resources Conservation Service)
- 3f Habitat Encroachment Buffers (Pheasants Forever)
- 3g Campaign for Conservation (The Nature Conservancy)
- 4a Critical Lands Conservation Initiative IV (Pheasants Forever)
- 4b Fisheries Acquisition (DNR)
- 4c Critical Lands Protection Program (Trust for Public Land)
- 4f Minnesota NWTF Super Fund (National Wild Turkey Federation)
- 4g Campaign for Conservation - Acquisition (Nature Conservancy)
- 4h Minnesota Valley Refuge Expansion (Minnesota Valley National Wildlife Refuge Trust)
- 4i Habitat Acquisition - Professional Services (DNR)

Project completed: 06/30/2009

Metro Conservation Corridors (MeCC) - Phase III

Subd. 4c \$2,500,000

[Back to top of page](#)

Wayne Sames

DNR

500 Lafayette Road

St. Paul, MN 55155-4010

Phone: (651) 259-5559

Email: wayne.sames@dnr.state.mn.us

Fax: (651) 296-6047

Web: <http://www.dnr.state.mn.us/metroconservationcorridors>

Overall Project Outcome and Results:

During the third phase of the Metro Corridors project, the Metro Conservation Corridors Partners continued their work to accelerate protection and restoration of remaining high-quality natural lands in the greater Twin Cities Metropolitan Area by strategically coordinating and focusing conservation efforts within a connected and scientifically-identified network of critical lands. This corridor network stretches from the area's urban core to its rural perimeter, including portions of 16 counties. The Partners employed a multi-faceted approach, which included accomplishments in four specific result areas:

1. **Coordinate Metro Conservation Corridors and Metro Greenways Programs:** Partners met quarterly to review project accomplishments and coordinate activity. With DNR support, the partners also launched development of an online database to facilitate tracking and reporting of MeCC projects over time.
2. **Restore and Enhance Significant Habitat:** Collectively, the partners restored 770 acres of land, including 1.26 miles of shoreline. Restoration of an additional 259 acres was completed using other funds.
3. **Acquire Significant Habitat:** Collectively, the partners protected 721 acres of land, including more than one-half mile of shoreline through acquisition of fee title and conservation easements and leveraged an additional 232 acres of land and 1/4-mile of shoreline using other funds.
4. **Provide Community Conservation Assistance:** The Metro Greenways Program assisted four cities and two counties with the integration of natural resources information into local development and conservation planning and policy decisions.

Accomplishments during this phase also helped address a number of recommendations of the Statewide Conservation and Preservation Plan, including: protecting priority land habitats; protecting critical shorelands of streams and lakes; restoring land, wetlands, and wetland-associated watersheds; and improving connectivity and access to outdoor recreation.

Project Results Use and Dissemination

As projects were completed, the individual partners were encouraged to publicize accomplishments through press releases, organization newsletters, and websites. These efforts resulted in information being distributed to the public through websites, email lists, daily and weekly newspapers, newsletters, and other print materials. Additionally, once the MeCC database development is complete, the partnership hopes to be able to better disseminate information on its accomplishments through a public web portal.

COMPLETE OVERALL FINAL REPORT

Abstracts and Reports of Individual Partner Projects - available online at: http://www.lccmr.leg.mn/all_projects/2007_projects.html#20074c

- 1.1 Overall Summary and Coordination (DNR)
- 2.1 Restore/Enhance Significant Watershed Habitat (Friends of the Mississippi River)
- 2.2 Lower Minnesota River Watershed Restoration & Enhancement Project (Friends of Minnesota Valley)
- 2.3 Restore and Enhance Significant Habitat (Great River Greening)
- 2.4 Habitat Restoration and Enhancement Grants (DNR)
- 2.5 Scientific and Natural Area (SNA) Restoration and Enhancement (DNR)
- 2.6 Stream Habitat Restoration (Trout Unlimited)
- 3.1 Critical Lands Protection Program - Fee Title & Conservation Easement Acquisition (Trust for Public Land)
- 3.2 Protecting Significant Habitat by Acquiring Conservation Easements (Minnesota Land Trust)
- 3.3 Fee Acquisition for Minnesota Valley National Wildlife Refuge (Minnesota Valley National Wildlife Refuge Trust)
- 3.4 Grants and Acquisition of Fee Title & Conservation Easements (DNR)
- 3.5 DNR Fish and Wildlife Acquisition (DNR)
- 3.6 Acquisition of Significant Habitat (DNR)
- 4.1 Assist Local Governments to Promote Conservation of Natural Habitats (DNR)

Project completed: 06/30/2009

Prairie Stewardship Assistance for Private Landowners

Subd. 4d \$220,000

Jason Garms

DNR
175 County Rd 26
Windom, MN 56101

Phone: (507) 831-2900

Email: jason.garms@dnr.state.mn.us

Fax: (507) 831-2921

Web: <http://www.dnr.state.mn.us>

[Back to top of page](#)

Overall Project Outcome and Results

This project provided voluntary, long-range conservation planning and management assistance to private landowners with native prairie. Native prairie is Minnesota's most threatened natural habitat. Less than 1% of the state's native prairie survives - and most of this is on private land. This project provided native prairie landowners with stewardship plans that inventoried and evaluated native prairie and other land resources on their property, identified the landowner's goals and objectives, and recommended ecologically sound management strategies. A total of 25 Prairie Stewardship Plans were created with this project's funds. Landowners were also given an opportunity to participate in 3 different workshops and field days where they could learn more about appreciating and managing their prairies. Furthermore, this project helped landowners with existing stewardship plans to implement their plans by providing cost-share assistance for management practices. Examples of practices cost-shared include prescribed burning (349 acres completed), invasive species treatments (65 acres completed), prairie reconstruction (33 acres completed), and woody encroachment removal (273 acres completed).

Project Results Use and Dissemination

Copies of Stewardship Plans are provided to local DNR managers and used by the landowner with other agencies and programs.

FINAL REPORT

Project completed: 6/30/2009

State Parks and Trails Land Acquisition

Subd. 4e \$1,500,000

[Back to top of page](#)

Larry Peterson (Parks) and Ron Potter (Trails)

DNR

500 Lafayette Rd

St. Paul, MN 55155

Phone: (651) 259-5593 (Larry) or (651) 259-5632 (Ron)

Email: larry.peterson@dnr.state.mn.us or ron.potter@dnr.state.mn.us

Fax: (651) 296-6532 (Parks) or (651) 297-5475 (Trails)

Web: Parks - http://www.dnr.state.mn.us/state_parks/index.html

Trails - http://www.dnr.state.mn.us/state_trails/index.html

Overall Project Outcome and Results

Environment and Natural Resources Trust Fund funding allowed for the following State Parks and State Trails fee title land acquisition projects:

- Ownership of approximately 48 acres within the statutory boundary of William O'Brien State Park. Acquisition of this the land eliminated the potential for development on this parcel and its associated impacts to the park, and buffered the park from existing residential development in the area. This parcel added to the existing 1,580 acres already protected within William O'Brien State Park within a Metro Wildlife Corridors Project Area that follows the St. Croix River valley. Preservation of this upland parcel protects the water quality of the adjacent wetlands and sub-watershed leading to the St. Croix River. This parcel provides a route for the proposed Gateway State Trail extension.
- Ownership of approximately 87 acres within the statutory boundary of Frontenac State Park. This parcel consists of primarily wetlands adjacent to Wells Creek delta, a significant migratory waterfowl stopover. The property also includes about 400 feet of shoreline on Lake Pepin and supports many "species of concern" identified in the County Biological Survey. The site is also surrounded by park ownership and is located within a Metro Wildlife Corridors Project Area.
- Ownership of 360 acres within the statutory boundary of George Crosby Manitou State Park. Acquisition of this parcel provided protection to one of the largest and highest quality old-growth northern hardwood forest complexes in the Lake Superior Highlands.
- Ownership of approximately 175 acres along the authorized Casey Jones State Trail corridor. Acquisition of this property secured a location for the future development of approximately one mile of trail corridor for the Casey Jones State Trail along Plum Creek, between Lake Shetek State Park and the community of Walnut Grove.

All acquisitions were from willing sellers, within the statutory boundaries of state parks and for statutory authorized state trails as determined by the Commissioner.

FINAL REPORT

Project completed: 6/30/2010

[Back to top of page](#)

Metropolitan Regional Park System Land Acquisition

Subd. 4f \$2,500,000

Arne Stefferud

Metropolitan Council
390 North Robert Street
St. Paul, MN 55101

Phone: (651) 602-1360**Email:** arne.stefferud@metc.state.mn.us**Fax:** (651) 602-1674**Web:** <http://www.metrocouncil.org/parks/parks.htm>**Overall Project Outcome and Results:**

This appropriation leveraged a total of \$18.1 million of other funds to acquire 528 acres for the Metropolitan Regional Park System as follows:

- 61 acres on the southern shore of Cedar Lake for Cedar Lake Farm Regional Park in Scott County (\$600,000 Environment Trust Funds, \$400,000 Metro Council bonds and \$3,526,192 of Scott County funds for a total of \$4,526,192).
- 8.2 acres including shoreline on the Mississippi River for Grey Cloud Island Regional Park in Washington County (\$109,256 Environment Trust Funds, \$72,838 Metro Council bonds, and \$273,141 Washington County funds for a total of \$455,235).
- 3 acres including shoreline on Lake Waconia for Lake Waconia Regional Park in Carver County (\$600,000 Environment Trust Funds, \$400,000 Metro Council bonds and \$1,530,000 Carver County funds for a total of \$2,530,000).
- 456 acres which encompasses the entire park for Empire Wetlands Regional Park in Dakota County (\$1,020,000 Environment Trust Funds, \$680,000 Metro Council bonds, \$800,000 other Metro Council grant approved in 2006, \$6 million of 2006 State bonds, \$3,444,000 of Dakota County funds for a total of \$11,940,000).
- 47 acres including shoreline of St. Catherines Lake for Doyle-Kennefick Regional Park in Scott County (\$170,744 Environment Trust Funds, \$677,625 Metro Council bonds and \$282,789 of FY 2009 Metro Greenways Grant for a total of \$1,1131,158).

Project Results Use and Dissemination:

Each regional park agency that received a grant or grants from this appropriation informs the public about the land acquisition with its own website and news releases. The Metropolitan Council also publishes a "Regional Parks Directory and Map" that informs the public about the recreation activities available at each regional park and trail and includes website addresses and phone numbers for each park agency for more information. Finally, the Metropolitan Council's website includes an interactive parks map that contains the same information as the paper version of the "Regional Parks Directory and Map" at <http://www.metrocouncil.org/parks/r-pk-map.htm>

FINAL REPORT**Project completed:** 10/22/2008[Back to top of page](#)**Non-Metropolitan Regional Parks and Natural and Scenic Area Acquisition**

Subd. 4g \$1,000,000

Wayne Sames

DNR
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 259-5559**Email:** wayne.sames@dnr.state.mn.us**Fax:** (651) 296-6047**Web:** <http://www.metrocouncil.org/parks/>**Overall Project Outcome and Results**

These programs provide competitive state matching grants to help and encourage local governments to acquire non-metropolitan regional parks and natural areas to meet current and future needs. For the regional park project, every \$3 of state grants was matched with \$2 of local funds. For the natural and scenic area projects, every dollar of state grants was matched by a dollar of local funds. Three acquisition grants were completed: one Regional Park Grant and two Natural And Scenic Area Grant. The total acreage acquired through all three projects was 310 acres. Approximately one mile of lake

shore line was protected.

Regional Park Grant: One Regional Park Grant totaling \$548,000 was made to Stearns County for the acquisition of 265 acres for a new regional park on Kraemer Lake near St. Joseph. Acquisition of this land provides the only publicly owned access to the lake. Much of the property was identified by the County Biological Survey as a significant native plant community. This land, part of the Avon Hills area, was acquired by the county in November, 2007.

Scenic and Natural Area Grant: Two grants were made for natural and scenic areas. In November 2007 the City of Prior Lake acquired 30 acres on Pike Lake for a new city park and natural area with a state grant of \$230,000. This acquisition protects one of the largest remaining areas of undeveloped shoreline in the city. In 2008 the City of Red Wing acquired 15 acres for an addition to an existing 72 acre Bluff Land Conservation Area with a state grant of \$156,000.

The remaining \$66,000 covered DNR administrative/personnel costs for the program.

Project Results, Use and Dissemination

Profiles and photos of these projects are available on the DNR web site at www.mndnr.gov. Click on "Grants" and then "Land Conservation" to find the links to the Regional Park Grants and Natural and Scenic Areas programs. Click on "Park Profiles" or "Project Profiles". Then go to the individual project profiles for a photo of the site, brief summary and links to local web pages.

FINAL REPORT

Project completed: 6/30/2009

LAWCON Federal Reimbursement

Subd 4h \$500,000

[Back to top of page](#)

Wayne Sames

DNR
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 259-5559

Email: wayne.sames@state.mn.us

Fax: (651) 296-6047

Overall Project Outcome and Results

The appropriation was used to pay for the state's administration of the Land and Water Conservation (LAWCON) program. This included administration of annual LAWCON grant solicitations for local projects, all grant management activities related to funded projects, all federal reporting requirements, management of funds used for state projects, management of several conversions of previously funded projects, and all monitoring and inspection activities required as a condition of acceptance of the federal funds. In addition, \$125,000 was used to fund purchase of picnic tables and fire rings/grates, most of which are accessible, for several state parks as follows:

State Park	Total # Tables	Accessible Table	Fire Rings*
Crow Wing	25	25	15
Father Hennepin	0	0	9
Fort Snelling	10	10	6
Frontenac	25	6	15
Maplewood	53	9	34
McCarthy Beach	25	8	15
Sibley	0	0	31
Upper Sioux Agency	25	25	15
Wild River	25	10	15
Afton	4	2	4
Total =	192	95	159

* All fire rings are accessible.

This project was consistent with action priorities outlined in the state's 2008-2012 State Comprehensive Outdoor Recreation Plan (SCORP) including:

- "Maintain and adequately fund current infrastructure, including improvements for safety, accessibility and energy efficiency."

- "Identify and address barriers to outdoor recreation, including economic issues, facility design, public awareness, and safety and security concerns."

Project Results Use and Dissemination

See chart above for location of funded tables and fire rings.

FINAL REPORT

Project completed: 6/30/2010

Biological Control of European Buckthorn and Garlic Mustard

[Back to top of page](#)

Subd. 4i \$300,000

Luke Skinner

DNR

500 Lafayette Rd Box 25

St. Paul, MN 55155

Phone: (651) 259-5140

Email: luke.skinner@state.mn.us

Fax: (651) 296-1811

Web: <http://www.dnr.state.mn.us>

RESEARCH

<http://www.dnr.state.mn.us/invasives>

Overall Project Outcome and Results

Garlic mustard (*Alliaria petiolata*) and European/common buckthorn (*Rhamnus cathartica*) are non-native invasive plants that severely threaten native plant communities and degrade wildlife habitat. This project focused on development of biological control as a long-term management strategy for these species. Reports describing the garlic mustard and buckthorn research in detail are attached to the project's Final Report. Garlic mustard biocontrol agents have not yet been approved for release in the US. Garlic mustard research focused on monitoring the 12 field sites for pre-release research. Garlic mustard monitoring data from 2005 to 2009 showed that garlic mustard populations can vary considerably from year to year. Garlic mustard plants are occurring at high population densities (mean densities up to 133 adult plants/m² and 720 seedlings/m²) and are currently experiencing very little herbivore attack in Minnesota. Work will continue on monitoring the field sites, developing rearing methods, and conducting field releases once insects are available. Buckthorn biocontrol research carried out in 2007-09 concentrated on a leaf-feeding moth, a leaf-margin gall psyllid, and a seed-feeding midge as potential biocontrol agents. The moth was found to lack enough host-specificity and was eliminated from consideration as a biocontrol agent. Host-specificity testing will continue for the leaf gall psyllid as larvae did not develop on the North American *Rhamnus* species tested. One complication is that the phytoplasma 'Candidatus *Phytoplasma rhamnii*' has been detected in the leaf gall psyllid. Future work will explore the implications of this phytoplasma for using the leaf-gall psyllid as a biocontrol agent. Initial success in rearing a population of the seed-feed midge will allow for future host-specificity testing of this insect. Future work will concentrate on 3 promising potential biocontrol agents, 2 psyllids, and the midge.

Project Results Use and Dissemination

The results of the garlic mustard and buckthorn research projects have been shared widely. Updates on the garlic mustard monitoring and biocontrol research and buckthorn biocontrol research were presented at the Minnesota Invasive Species Conference (Oct. 26-29, 2008, Duluth MN) and the upcoming Minnesota-Wisconsin Invasive Species Conference (Nov. 8-10, 2010, St. Paul, MN). In addition, results have been shared across the state through such venues as County Agriculture Inspector meetings, DNR meetings, and Master Gardener meetings. There is considerable interest in these programs and enthusiasm for the potential for biological control of garlic mustard and buckthorn. The results of the garlic mustard monitoring research were reported in the article "Population Biology of garlic mustard (*Alliaria petiolata*) in Minnesota hardwood forests" by L. Van Riper, R. Becker, and L. Skinner in 2010 in the journal *Invasive Plant Science and Management* (3:48-59). Results of the buckthorn research were reported in the article "Use of native range surveys to determine the potential host range of arthropod herbivores for biological control of two related weed species, *Rhamnus cathartica* and *Frangula alnus*" by A. Gassmann, I. Tosevski, and L. Skinner in 2008 in the journal *Biological Control* (45:11-20).

Project Publications:

1. Biological control of buckthorns, *Rhamnus cathartica* and *Frangula alnus* - Report 2008-2009
2. Monitoring garlic mustard (*Alliaria petiolata*) in anticipation of future biocontrol release (2005-2009)

FINAL REPORT

Project completed: 6/30/2010

Neutralization of Reed Canary Grass Root Exudates

[Back to top of page](#)

Subd. 4j \$115,000

Bradley Cook

MN State University
242 Trafton S
Mankato, MN 56001

Phone: (507) 389-5728

Email: bradley.cook@mnsu.edu

Fax: (507) 389-2788

Web: <http://cset.mnsu.edu/biology/people/cook/index.html>

RESEARCH

Overall Project Outcome and Results

Reed canary grass (*Phalaris arundinacea*; hereafter Pa) is an aggressive plant invading wetlands in the Midwest. Invasion by Pa leads to a reduction of native plant diversity and loss of wetland functionality. Our ability to control invasion by Pa and reestablish native plant communities has been unsuccessful because of our limited understanding of the mechanisms that allow Pa to become invasive. The study of plant-soil feedbacks as a mechanism for dominance is a two-step process: plants alter their soil microbial community; and the altered soil microbial community has a positive feedback on plant growth or a negative feedback on neighboring plants. Results from three experiments comparing soil microbial communities and plant growth revealed that *Phalaris arundinacea* (Pa) used plant-soil feedbacks to outcompete tussock sedge (*Carex stricta*; hereafter Cs).

In a soil training experiment, Pa and Cs cultured their soil microbial communities in a manner that differed in both magnitude and composition. Soil training had a neutral feedback on Pa growth and a negative feedback on Cs.

In our first reciprocal transplant experiment, growth of Pa and Cs was greater in their corresponding native soils than in the soil of the other species. Thus, both plants receive positive feedback from their native soil microbial communities. Soil microbial communities were similar when cultivated by Pa regardless of soil type, and Cs soil microbial community catabolic activity depended on soil type.

In our second reciprocal transplant experiment, the effects of competition were dependent on soil microbial communities. Pa growth was best in competition with Cs in Cs-native soils and Pa-sterile soils. Competition did not affect the growth of Cs; however, Cs growth was least in native soils from Pa and Cs. In sterile soils, soil microbial communities depended on the type of competition. In native Pa soils, heterospecific competition had a greater effect on soil microbial communities than did conspecific competition.

Denaturing gradient gel electrophoresis (DGGE) analysis indicated that Pa SMCs were stable and of low diversity, but Cs SMCs were dynamic and of comparatively high diversity.

Bioassays and gas chromatography-mass spectrometry (GC-MS) analyses revealed the presence of methyl esters of fatty acids known to have antimicrobial activity.

Our results suggest that Pa does not use alleopathy, but is induced to produce an antimicrobial compound that has a strong, directional effect on soil microbial communities, which promotes its growth and inhibits the growth of neighboring plants.

Project Results Use and Dissemination Portions of Results 1, 2, and 3 have been written as a manuscript (A plant-soil feedback as a mechanism for the invasive success of *Phalaris arundinacea*) and is being revised for publication. A second manuscript including Results 1-5 is in preparation by the investigators. Portions of this work were presented:

1. As an invited talk at the University of Bern, Switzerland (8/08)
2. At the 93rd Annual Ecological Society of America Meeting; Milwaukee, WI. (8/08)
3. At the 13th Annual Conference of the Wisconsin Wetland Association; Oconomowoc, WI. (2/08)
4. Two papers at the North American Lake Managers Society (NALMS) International Conference; Hartford, CT. (10/09)
5. Four papers at the 2008 and 2009 Minnesota State University Undergraduate Research Conference (4/08 and 4/09)

In addition, portions of this work were used for a M.S. thesis project, as class exercises in undergraduate courses, and as several undergraduate independent research projects at Minnesota State University.

FINAL REPORT

Project completed: 6/30/2009

Subd. 5 Water Resources

Local Water Management Matching Challenge Grants

[Back to top of page](#)

Subd. 5a \$350,000

David Weirens

BWSR
520 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 297-3432

Email: david.weirens@state.mn.us

Fax: (651) 297-5615

Web: <http://www.bwsr.state.mn.us>

<http://www.bwsr.state.mn.us/grantscostshare/lwplanning/index.html>

Overall Project Outcome and Results

Grants were awarded to 4 counties, 5 soil and water conservation districts, 2 water management organizations, and 1 joint powers board for the purpose of implementing high priority actions identified in current state approved and locally adopted comprehensive water management plans. The funds were used to complete the following projects:

- Prevented agricultural tile flows from discharging to surface waters and monitored nitrate concentrations of these flows in the Nile Mile Creek watershed.
- Protected nearly 900 acres of land adjacent to lakes and streams in Cass and Aitkin Counties.
- Implemented 10 grazing plans to reduce fecal coliform loading to the Root River.
- Generated watershed delineations and lake volume calculations that contributed to the adoption of development restrictions on 44 lakes in Itasca County.
- Completed preparations that ultimately will stabilize a streambank to protect a cemetery in Hallock from a slumping streambank.
- Designed and stabilized a 2-mile segment of a judicial ditch in the Bostic Creek watershed of Lake of the Woods County.
- Demonstrated that straw bales result in decreased phosphorus concentrations in ditch flows to Lake Volney in Le Sueur County.
- Installed a grade stabilization structure in a gully to prevent the deposit of sediment into the St. Croix River.
- Restored shoreland along Mille Lacs Lake in Mille Lacs County.
- Reduced the discharge of stormwater from the City of Wadena.
- Tested the quality of water in the Mt. Simon Aquifer and sealed three wells in Washington County.

Project Results Use and Dissemination

Results of the specific projects are available upon request from the Board of Water and Soil Resources.

FINAL REPORT

Project completed: 6/30/2010

Protection of Rare and Unique Rock Outcrop Wetlands

[Back to top of page](#)

Subd. 5b \$563,000

Thomas Kalahar

Renville Soil & Water
1008 W Lincoln
Olivia, MN 56277

Phone: (320) 523-1559

Email: kalahar@yahoo.com

Fax: (320) 523-2389

Web: <http://www.renvilleswcd.com>

Overall Project Outcome and Results

The Minnesota River Valley contains ancient bedrock outcrops with associated wetlands that provide unique habitats for specialized plant and animal communities rarely found elsewhere in Minnesota. These resources are threatened by mining and other development interests, as removal of the rock results in the severe degradation or permanent loss of the wetlands located among the rock complexes. Although the wetlands vary greatly in size and duration, some of the smallest and most temporary basins harbor the rarest and most specialized plants. Many of these wetlands may not be protected due to de minimis (i.e. minimum size) exceptions to the Wetland Conservation Act. Rock outcrops are also a component of the Minnesota River's riparian zone and destruction of this unique habitat will continue to degrade the water quality and aquatic habitat of the Minnesota River and its tributaries. Unlike other mining operations, there is no reclamation plan possible for replacing this very unique landscape feature once it is removed. This project consisted of efforts to protect these unique habitats through conservation easements and habitat restoration activities.

For the conservation easements portion of the project, applications from 9 landowners totaling 788 acres were scored by a team of natural resource professionals to determine the highest quality sites under grant guidelines. The goal of this project was to protect 200 acres with Reinvest in Minnesota (RIM) perpetual conservation easements in Renville and Redwood Counties. That goal was exceeded and 212.4 acres were protected. Four landowners received \$517,411 in easement payments from grant funds. In accordance with the RIM program, landowners retain ownership.

For the habitat restoration portion of the project, \$16,049 in grant funds were used for invasive species control, along with \$31,441 leveraged from other sources to assist in meeting the goals of the conservation plans developed on each easement as part of the RIM process.

Project partners were USDA NRCS, MN DNR Wildlife (Heritage Enhancement), DNR ECO-Non Game (Heritage Enhancement), State of Minnesota Native Buffer Cost Share Program, and US Fish & Wildlife Service.

Project Results Use and Dissemination

Initially staff from the Renville & Redwood Soil & Water Conservation Districts (SWCD) had face-to-face contact with landowners. This proved to be a very successful way of generating applications, as 788 acres were offered. The applications that were not funded were kept for future reference and landowners have all been contacted and given an opportunity to apply for dollars from the ML 2009 Environment and Natural Resources Trust Fund appropriation for \$1.5 million, for which we have a goal of enrolling an additional 530 acres in perpetual easements.

Several newspaper articles have been published since the inception of the 2007 grant. The regional West Central Tribune in Willmar, MN has done articles about the program. In addition local newspapers have included articles about the program. Tom Kalahar, Project Manager, was interviewed by Fred Harris for an article published in the March-April 2009 issue of the Minnesota Conservation Volunteer. The early articles caused landowners in other counties to request information on how they could enroll their land into the program. This landowner interest resulted in Chippewa, Yellow Medicine and Lac qui Parle SWCD offices joining Renville & Redwood in making application for the 2009 funds.

The Renville SWCD continues to update the public on the status of the grants on their website www.renvillewscd.com Tom Kalahar has done informational/educational talks on the Minnesota River Basin and the unique features of the Granite Rock Outcrops. Audiences included the general public in both Redwood Falls and New Ulm, a presentation for landowners in the Renville/Chippewa DNR Working Lands Initiative area, as well as a presentation to the Upper Sioux Community. DNR Private Lands Program staff have used their one-on-one contacts with landowners to promote the program in addition to sponsoring the Landowner Workshop which included Tom's presentation on the Rock Outcrop program.

In August 2008, Renville SWCD hosted the Board of Water & Soil Resources (BWSR) meeting. A one day tour for about 60 people included stopping at a rock outcrop site. SWCD staff used this opportunity to inform the BWSR and guests about the uniqueness of the natural resource and to give them an update on progress toward meeting the goals for the grant.

Local SWCD staff and supervisors continue to keep their local County Boards informed about progress of not only the 2007 grant but also about landowner interest for future funding.

FINAL REPORT

Project completed: 6/30/2009

Land Retirement Effects on Minnesota River Basin Streams

Subd. 5c \$275,000

[Back to top of page](#)

Victoria Christensen
U.S. Geological Survey
2280 Woodale Drive

Mounds View, MN 55112

Phone: (763) 783-3100

Email: dinger@smm.org

Fax: (763) 783-3103

Web: <http://mn.water.usgs.gov/>

RESEARCH

Overall Project Outcome and Results

The Minnesota River Basin lies within one of the most productive and intensively managed agricultural regions in the world. Current agricultural practices use large quantities of chemical fertilizer to maintain productivity - as much as 7.4 and 2.9 tons/mi² for nitrogen and phosphorus, respectively. The excess of these nutrients have the potential for deleterious effects on stream quality through runoff. To address concerns about degradation of agricultural streams, the state of Minnesota was requested to provide funding to retire an additional 100,000 acres of agricultural lands to improve water quality and aquatic biology. This study was designed to provide a comprehensive evaluation of agricultural set-aside programs on a basin scale and their effect on water quality.

This study was divided into two phases. The primary Phase 1 objective was to compare water quality and aquatic biological conditions across three basins similar with respect to physical setting and hydrology, but differing in the degree of agricultural land retirement. The Phase 2 objective was to assess the relation between biotic integrity and land retirement across the Minnesota River Basin.

Fully-instrumented sampling sites with automated samplers, water-quality monitors, and streamflow gages were installed from 2005-2008. Findings include:

- Nitrogen concentrations were highest, with a mean of 15.0 mg/L, in South Branch Rush River, the subbasin with little land retirement; nitrogen concentrations were lower in Chetomba Creek (mean of 10.6 mg/L) and West Fork Beaver Creek (mean of 7.9 mg/L), subbasins with more land retirement at the basin scale.
- Total phosphorus concentrations were not directly related to land retirement percentages with average concentrations of 0.259 mg/L at West Fork Beaver Creek, 0.164 mg/L at Chetomba Creek, and 0.180 mg/L at South Branch Rush River.
- Index of biotic integrity (IBI) scores increased as local land retirement percentages (within 50 and 100 meters of the streams) increased.
- Comparisons made within the basins showed that nutrient, suspended-sediment, and chlorophyll-a concentrations decreased with increasing land retirement.

Data from this study can be used to evaluate the success of land retirement programs for improving stream quality. Two reports will be published in September 2009, describing Phase 1 and Phase 2 of the study.

Project Results Use and Dissemination

The results from this study were disseminated through USGS and BWSR websites, two abstracts, a conference proceeding paper, and several presentations and posters. The water-quality and streamflow information was provided in real-time through the USGS website. USGS and BWSR personnel have participated in basin activities highlighting the selected subbasins and emphasizing the effects of land retirement. A USGS Scientific Investigations Report entitled, "Water-Quality and Biological Characteristics and Responses to Agricultural Land Retirement in Streams of the Minnesota River Basin, Water Years 2006-08" is scheduled to be published by September 30, 2009. A manuscript has been completed covering Phase 2 of the study and will be submitted to a peer reviewed journal in September 2009.

FINAL REPORT

Project completed: 6/30/2009

Demonstrating Benefits of Conservation Grasslands on Water Quality

Subd. 5d \$374,000

James Almendinger

Science Museum of Minnesota

16910 152nd St N

Marine on St. Croix, MN 55047

Phone: (651) 433-5953

Email: dinger@smm.org

Fax: (651) 433-5924

Web: <http://www.smm.org/scwrs>

[Back to top of page](#)

RESEARCH

Overall Project Outcome and Results

This study used sediment accumulation rates in 26 lakes in southern and western Minnesota as a measure of the delivery of eroded soil and phosphorus from watershed uplands to the lakes. Accumulation rates were calculated for the periods 1963-1986 and 1986-2007 to characterize sediment and phosphorus delivery before and after 1986, when many agricultural lands were converted to grasslands as part of the Conservation Reserve Program (CRP). Inorganic sediment accumulation rates decreased with increasing area of conservation grassland in the watershed. This linear relation explained only about 20% of the variance, leaving substantial unexplained scatter. The relation predicted that sediment accumulation would decrease by 3-4% for every 10% of cropland converted to grassland. Consideration of wetland sediment traps within the watershed did not measurably improve the relationship, nor did consideration of soil erodibility, slope, or flow accumulation factors. The decrease in sediment phosphorus accumulation rates as a function of increasing grassland area was not statistically significant at the $p = 0.05$ level. Diatom analyses demonstrated biotic change in selected lakes over time. In two of these lakes the change appeared to be driven by lake-water phosphorus concentrations, which declined in the post-1986 period perhaps in response to increased grassland area. In the absence of substantial land-cover change, inorganic sediment accumulation increased by about 20% and sediment phosphorus increased by about 35%, indicating that other factors were influential. These factors could include changes in annual rainfall, artificial drainage, in-lake sediment transport processes, and lag effects in transport from uplands to lowlands.

We conclude that this study demonstrated a fundamental incoherence between field-scale parameters influencing erosion and watershed-scale measurements of erosion. We recognize the fundamental importance of the empirical plot-scale studies that have quantified the effects of erodibility, slope, flow length, land cover, and other factors on erosion and nutrient transport. Yet, the complexities of transport paths between field and receiving waters make watershed-scale erosion highly variable and difficult to predict. Use of plot-scale parameters without modification to predict watershed-scale sediment yields is inappropriate. We need better understanding to re-scale such parameters appropriately, which can only be achieved by intensive studies that bridge the intermediate scales between fields and watersheds. New data sets, especially improved topographic data from LiDAR, will help with this effort. However, nothing can replace the actual measurement of sediment yield at different scales, which will provide the necessary constraints for theoretical equations to give realistic results.

Project Results Use and Dissemination

- An interpretive summary report will be downloadable from the Museum web site.
- A short (2-4 pp.) fact sheet likewise will be downloadable from the Museum web site, with hardcopies made available as requested.
- Results will be published in the academic peer-reviewed literature.

FINAL REPORT

Project completed: 6/30/2010

Improved River Quality Monitoring Using Airborne Remote Sensing

Subd. 5e \$159,000

[Back to top of page](#)

Fei Yuan

Mankato State University
Earth Science Program, 7 Armstrong Hall
Mankato, MN 56001

Phone: (507) 389-2617

Email: fei.yuan@mnsu.edu

Fax: (507) 389-2980

Web: <http://sbs.mnsu.edu/geography/people/feiyuan.html>

RESEARCH

Overall Project Outcome and Results

To improve the study and monitoring of river water quality and riparian habitat in Minnesota this project proposed and successfully implemented a new and innovative research methodology, airborne dynamic hyperspectral remote sensing (remote sensing measures properties of the environment using sensors placed on aircraft or spacecraft). This study has more accurately and cost effectively identified water quality and critical sediment supply areas than possible through traditional or previously used monitoring methods. All methods and results developed here can readily be applied to other

watersheds.

For the first time ever in the USA we employed the highly cost effective Civil Air Patrol (CAP) ARCHER (Airborne Real-time Cueing Hyperspectral Enhanced Reconnaissance) remote sensing system to monitor water quality in a river. In addition to successfully piloting this new methodology in the highly impacted Blue Earth River (BER) watershed, tangible results and products include:

- Located highly erodible lands in the BER riparian corridor.
- ARCHER can successfully identify Total Suspended Sediment, Turbidity and other water quality measures thus potentially reducing time and costs using traditional methods in any watershed.
- Identified locations of high sediment input areas and spatial and temporal patterns of river water quality.
- Developed a hydrologic model to predict amount and location of sediment and stream flow based upon the size and intensity of precipitation events.
- A Geographic Information System database was developed that contains all project data.
- Two full years of detailed water quality data collected from ARCHER flights, traditional field sampling methods and related laboratory analyses. Water samples were collected along the entire river system at the same time as ARCHER flyovers, during spring runoff and during nearly all rainfall events.
- Processed remote sensing imagery and laboratory data from this study is ready for use in future studies and management decisions.

Project Results Use and Dissemination

The results and findings were documented in project updates to the LCCMR, through multiple conference presentations by the project scientists and their graduate students, three Minnesota State University (MSU) Geography Department master's theses, several academic articles, and further professional presentations are in preparation, with some of these items already available on the web. Partnerships established to complete the project include local, county, regional, state and federal agencies and scientists at those agencies and at other universities. Communication and outreach has flourished with the creation of a nation-wide ARCHER working group founded by this project's scientists: members include MSU, and professionals from 13 other state and federal agencies, universities, and the private sector. A meeting of the working group will take place April 2010 at the annual meeting of the Association of American Geographers (AAG) in Washington, DC.

To implement and complete the project we established partnerships with MPCA, Faribault & Martin Co. Soil & Water Conservation Districts, U.S. Army Corps of Engineers, and University of Minnesota. In 2008, we were contacted by USGS and Missouri (Mo) DNR who were interested in knowing more about our projects and findings. Thereafter, we formed an ARCHER working group to "provide a forum for agencies/researchers with on-going or anticipated projects using ARCHER imagery to collaborate, exchange information on promising applications and share analytical techniques" (<http://rmgsc.cr.usgs.gov/awg/index.shtml>). Besides us, other members include CAP, USGS, USFWS, EPA, FEMA, BLM, MoDNR, MoRAP (Missouri Resource Assessment Partnership), Space Computer Corporation, and other university and industry-based individuals. The working group holds monthly conference calls and exchanges lots of e-mail and phone communications. We have organized special sessions on ARCHER applications in the 2010 national conference of the AAG (Association of American Geographers) in Washington, DC.

Especially noteworthy is our partnership with the CAP (Civil Air Patrol). Based on methodologies we developed specifically for this project to pre-process ARCHER data, the CAP has now adopted our methods and has now supplied the needed software to all 16 ARCHER stations across the country. This is of great significance because of the potential for using ARCHER in environmental monitoring nationwide.

FINAL REPORT

Project completed: 6/30/2009

Evaluating Riparian Timber Harvesting Guidelines: Phase 3

Subd. 5f \$400,000

Charles Blinn

U of M
1530 Cleveland Avenue N
St. Paul, MN 55108

Phone: (612) 624-3788

Email: cblinn@umn.edu

Fax: (612) 625-5212

Web: <http://www.forestry.umn.edu/people/facstaff/blinn/>

[Back to top of page](#)

RESEARCH

Overall Project Outcome and Results

This project continues research begun with M.L. 2001 and M.L. 2005 appropriations from the Environment and Natural Resources Trust Fund.

Research addressing the long-term effectiveness of riparian guidelines to mitigate harvesting impacts is critical to resolve management conflicts and sustain Minnesota's forest resources. This project:

1. Evaluated the long-term effectiveness of Minnesota's riparian timber harvesting guidelines within Pokegama Creek (single-basin study) and on eight separate basins located across northern Minnesota (multiple-basin study);
2. Began to combine and synthesize data from the various study components through a "meta-analysis";
3. Provided outreach information.

Terrestrial findings that can help guide future management of Minnesota's forests and streams include:

- Partially-harvested riparian management zone (RMZ) treatments resulted in fully-stocked stands, however, species composition differed among treatments;
- Northern white cedar and balsam fir seedlings survive and grow well in non-wet microsites with medium residual basal area;
- Cedar seedlings require protection from deer browsing;
- Different treatments had minimal impact on the amount of organic matter input to streams;
- Residual tree blowdown was low, but future potential is still high.

Effects of riparian harvest on fish and fish habitat were assessed at the basin scale. Sediment levels remained above 1997 pre-harvest conditions until fall 2007. Riparian harvest may have contributed to increased stream temperatures, but fish abundances were negatively associated with differences in mean summer air temperature.

Aquatic findings that can help guide future management of Minnesota's forests and streams include:

- No differences in water chemistry between harvested and unharvested riparian reaches;
- Trends toward higher in-stream light levels and elevated periphyton standing crops within harvested riparian areas compared to control reaches;
- Trends toward a greater proportion of scraper invertebrates and fewer shredder invertebrates in harvested riparian reaches.

At the single-basin tributary sites, the majority of bird species present were associated with mature forest habitat pre-harvest. After harvest, early successional habitat associated species maintained dominance in all sites. The pre-harvest bird community was neither maintained nor able to reestablish on unharvested riparian buffers 9-11 years after harvest.

We observed interannual variation in diversity and species richness within the macroinvertebrate and fish communities, but few effects related to harvest treatments. Few changes in diversity and richness were observed in the bird community but changes were observed by the replacement of mature forest species by early successional avian species, related closely to the vegetation type.

There is a need to continue monitoring the sites to more fully assess effects over time.

Project Results Use and Dissemination

A workshop entitled "At the Water's Edge: Current State of Riparian Forest Management Research in Minnesota" was presented in Grand Rapids on May 20, 21, and 22, 2008. The purpose of the workshop was to interpret research results from the single- and multiple-basin riparian effectiveness monitoring studies as well as the Minnesota Forest Resource Council's Riparian Science Technical Committee findings for natural resource managers and loggers. The program included both indoor and outdoor components. There were 102 participants over the course of the three days.

A website was developed to provide information about the project, including a project overview, more detailed descriptions of our research, information about project personnel, a listing of project cooperators, project publications, and information presented during our workshop. The url for that website is <http://rmzharvest.cfans.umn.edu/>. A second website was created to allow project researchers to access data (<http://rmzharvest.cfans.umn.edu/login>).

Beyond the workshops and website, project results were disseminated to scientists, natural resource managers, private landowners, researchers, and others through nine presentations, one refereed manuscript, and one field tour. Three additional manuscripts are in preparation. One graduate student produced a thesis from their project work. Other graduate students continue to collect, analyze, and summarize data which will result in additional theses. Annual summaries of project results were provided to the Minnesota Forest Resources Council for inclusion in their Annual Report.

As this research study was designed to be a long-term assessment with little dissemination during the initial project phases, researchers will continue to monitor, analyze, and report post-harvest effects in the future as funding permits. With that

additional information, we will be able to assess how birds and terrestrial and aquatic ecosystems respond to timber harvesting within RMZs over the long-term. Results will then be used to inform on-the-ground decision making as well as suggest changes to the guidelines to more effectively manage forested riparian areas.

FINAL REPORT

Project completed: 6/30/2009

Innovative Springshed Mapping for Trout Stream Management

[Back to top of page](#)

Subd. 5g \$270,000

E. Calvin Alexander, Jr.

U of M
Geology & Geophysics
310 Pillsbury Dr. SE
Minneapolis, MN 55455

Phone: (612) 624-3517

Email: alexa001@umn.edu

Fax: (612) 624-3819

Web: <http://www.geo.umn.edu/people/profs/ALEXANDER.html>

RESEARCH

Overall Project Outcome and Results

Trout streams depend on a steady supply of clean, cold water to exist. The U of M's Geology and Geophysics Dept. and the DNR Waters worked to identify and map the karst springs and their recharge areas that supply water to southeastern Minnesota's 173 trout streams and to assess the impacts that both land and aquatic development are having on these springs.

Delineation of the recharge areas or springsheds of the trout springs is a crucial first step in the protection of the trout fisheries and the restoration of those that have been degraded. Established fluorescent dye tracing techniques were refined, accelerated and expanded into springsheds parts of southeastern Minnesota not previously traced. Traces in Fillmore and Olmsted counties defined new trout stream springsheds and expanded and refined information on previously known trout stream springsheds in the Galena Aquifer. The traces in Winona and Houston Counties began the definition of trout stream springsheds draining the Prairie du Chien Aquifer. Prairie du Chien springs supply water to several major fish hatcheries and trout streams.

Although many of southeastern Minnesota's trout stream are headed by springs flowing from the St. Lawrence Formation, the St. Lawrence has been assumed to be an aquitard in Minnesota Rules. Three successful traces through the St. Lawrence Formation in Winona and Houston Counties demonstrated that water flows rapidly through the St. Lawrence to trout springs. This unexpected discovery is a major advance in our understanding and management of these trout springs and is resulting in a significant reevaluation the hydrogeology of the St. Lawrence Formation.

In addition to dye tracing, four innovative Trout Springshed Assessment protocols were investigated. The first was the use of data logger technology to characterize time variations in the thermal and chemical properties of trout springs. The temperature loggers identified at least four distinct patterns of temperature variations present in trout springs which in turn yield information about the respective springsheds. The second innovative technique was the construction of new, high precision structural contour maps of the geologic strata hosting trout springsheds. This tool looks promising but will require more precise mapping that is currently available. The third innovation was an investigation of the relationship between the size of springsheds and the base flow volume of the trout springs. This technique is promising but requires more well defined springsheds to become a practical tool. The last technique investigated was the measurement of dissolved organic compounds (DOC) in the springs. Significant differences in the amount and composition of the DOCs were observed which may be relatable to varying land uses in the springsheds.

The springsheds defined by the tracing and the other tools allow an accurate documentation of the rapid, direct impact of surface land uses in the springsheds and the water quality in the trout streams. This in turn allows better management of the springsheds to protect the trout streams and groundwater resources.

Project Results Use and Dissemination

The dissemination and use of the results of the trout springsheds delineation has varied depending on the level of the user. At the local level one of the most effective dissemination tools has been to get the landowners and users involved in the research itself. This has included getting Harmony High School students involved in the traces around Harmony, Minnesota.

Getting many of the local residents involved in the tracing. Getting the County staffs, local organizations, the trout fishing community and the trout hatchery staffs involved in the tracing. We send copies of the reports into the hands to the affected landowners and residents involved. All of these people now know the speed at which the surface runoff can reach their trout streams. They are the "first line of defense" in maintaining and improving the water quality in the trout streams.

At the regional and state levels Alexander and Green have made numerous presentations various state water management and ground water meetings. We have led field trips highlighting the results of this project. Contribute the results of this information at a variety of levels inside the Minnesota State Government. The information is built into short courses, training sessions, technical comments and University of Minnesota courses. The discovery that water moves rapidly through the St. Lawrence "aquitard" is already impacting management rules and practices in several State Agencies. The increasingly detailed knowledge of the springsheds is an important part of the TMDL effort to protect and improve water quality in trout streams in southeastern Minnesota.

At the national level the results obtained in this project were presented at the 11th Multidisciplinary Conference on Sinkhole and the Engineering and Environmental Impacts of Karst, at Geological Society of America meetings and published in their Proceedings. National Science Foundation summer interns have participated in the research effort and taken the knowledge and experience back to other states.

PROJECT PUBLICATIONS:

1. Spring Characterization Methods and Springshed Mapping
2. Dye Tracing Within the St. Lawrence Confining Unit in Southeastern Minnesota
3. 2 July 2007 Morehart Farm Dye Trace
4. Frego Creek Dye Trace
5. Harmony Spring 2008 Dye Trace
6. A Quantitative Dye Trace in the Bat River System & Poster
7. Peptidoglycan Degradation Fluorescence: Applications to Karst Groundwater Mapping & Poster
8. Forestville North Dye Trace
9. Sinks and Rises of the South Branch Root River, Fillmore Co., MN
10. Flow Path Characterization using Spring Thermographs
11. Holy Grail Cave, Fillmore County, Minnesota
12. Harmony Fall 2008 Dye Trace
13. Frego Creek Spring 2009 Dye Trace

FINAL REPORT

Project completed: 6/30/2009

Work Program

Intra-Lake Zoning to Protect Sensitive Lakeshore Areas

Subd. 5h \$110,000

[Back to top of page](#)

Paul Radomski

DNR

1601 Minnesota Drive

Brainerd, MN 56401

Phone: (218) 833-8643

Email: paul.radomski@dnr.state.mn.us

Fax: (218) 828-6043

Web: <http://www.dnr.state.mn.us>

Overall Project Outcome and Results

Minnesota's lakes are one of its most valuable resources. In particular, naturally vegetated shorelines provide feeding, nesting, and breeding habitat for many species. These areas, defined by natural and biological features that provide unique or critical ecological habitat, are known as sensitive lakeshores. Increasing development pressure within shorelands may have negative impacts on these sensitive areas - and Minnesota's shorelands are being developed at a rapid rate.

With this in mind, the Minnesota Department of Natural Resources developed a protocol for identifying sensitive lakeshores. The project focused on seventeen high priority lakes, identified by Cass County. These lakes represent some of the county's most valuable waters - large lakes with significant undeveloped shorelands. Protocol to identify sensitive lakeshores consists of several components:

- Field surveys evaluate the distribution of high priority plant and animal species.
- An ecological spatial model, based on scientific data, ranks lakeshore areas for sensitive area designation. The model

provides objective, repeatable results that can be used as the basis for regulatory action.

Field surveys were conducted on all seventeen high priority lakes as well as three connecting lakes. Sensitive lakeshore area assessments were completed on nine high priority lakes. Reports summarizing these assessments were delivered to Cass County and interested organizations that could use the information to maintain high quality environmental conditions. To date, 48 miles of shoreline (approximately 36 percent of total surveyed shoreline miles) have been identified as sensitive lakeshore. Cass County is working to develop provisions in their land use ordinance that will require conservation-oriented development standards for sensitive areas. They will then propose and implement resource protection zoning districts. These resource protection districts will help promote healthy near-shore communities and protect critical fish and wildlife habitat.

Project Results Use and Dissemination

Nine Sensitive Lakeshore Reports were produced, and these reports are posted on the project's website. Public presentations were made explaining the project and the details of the sensitive lakeshore reports to the Cass County Board of Commissioners, the Cass County Planning Commission, the Association of Cass County Lake Associations, U.S. Forest Service, seven lake associations, and several interested groups and organizations. Cass County will hold public hearings on shoreland ordinance revisions and reclassifications in an effort to protect identified sensitive lakeshores, and all required processes for public input, review, and comment will be adhered to, including the rights afforded to challenge such ordinance and zoning district changes.

FINAL REPORT

Project completed: 6/30/2009

Water Resource Sustainability

Subd. 5i \$292,000

[Back to top of page](#)

John Nieber

U of M

1390 Eckles Avenue Rm 203

Minneapolis, MN 55108

Phone: (612) 625-6724

Email: nieber@umn.edu

Fax: (612) 624-3005

Web: https://wiki.umn.edu/view/Water_Sustainability

RESEARCH

Overall Project Outcome and Results

To assure that our use of freshwater within Minnesota is sustainable into the indefinite future it is necessary to know beforehand the rate of renewal of our freshwater supplies on an annual basis. The rate of renewal of freshwater supplies is a measure of the limits of the natural system to sustain both human needs as well as the needs of nature (ecological services). This project quantified this rate of renewal across the state and related the rate to various characteristics of the local landscape. This quantification was achieved using streamflow records for gauged watersheds located throughout Minnesota. The final result is in the form of atlases of mean minimum annual groundwater recharge (the rate of annual renewal of the freshwater resource) at three different geographical scales: statewide, regional, and county. Regional atlases were developed for the east central, southeast, and south central regions of the state. County atlases were created for Pope, Lac Qui Parle and Olmsted counties. Based on these atlases and the MNDNR water permits a database was produced that will allow the quantitative comparison of renewable freshwater supply and the water demand for human use down to the scale of individual township sections. The database provides the information needed to assess freshwater sustainability on any desired geographical scale. The atlases and the database supplied by this project will be of value to water planners at all geographical levels. One limitation of the current results provided is that they do not account for changes that occur in time, and therefore do not account for possible effect of future climate change. This aspect is needed to provide additional information to water planners for consideration of the risks posed by climate change.

Project Results Use and Dissemination

To date the project results have been used for an assessment of siting of a gas-fired power plant in Chisago County. In this case John Nieber was requested by 'The Friends of the Sunrise' to speak to their group, and other interested citizens regarding to the availability of groundwater resources for projected use by the power plant. The Minnesota Environmental Quality Board used results from the precursor study in helping to formulate the EQBs 2008 report on water resources sustainability, and it is expected that the results of the current study will be used for similar statewide assessments in the future. Of course it is the hope of the PI and co-PI of the project that the results will be used by the MNDNR, the MPCA,

and by other agencies in conducting water resource planning activities. A website for the project exists at https://wiki.umn.edu/view/Water_Sustainability. Many presentations have been made regarding this project every since the project began in 2007.

FINAL REPORT

Project completed: 6/30/2009

County Geologic Atlas Program Acceleration

Subd. 5j \$400,000

[Back to top of page](#)

Dale Setterholm

MN Geological Survey
2642 University Ave W
St. Paul, MN 55114

Phone: (612) 627-4780

Email: sette001@umn.edu

Fax: (612) 627-4778

Web: <http://www.geo.umn.edu/mgs>

http://talc.geo.umn.edu/mgs/county_atlas/countyatlas.htm

Overall Project Outcome and Results

The County Geologic Atlas program creates geologic maps and associated databases at scales appropriate for resource management, especially ground water management, at the local scale. This grant funded progress on such mapping for Benton and Chisago counties. The counties qualified for participation by establishing accurate digital locations for water wells with construction records that are used as a basic data element in creating the maps. For each county the following products have been constructed:

- Database of well record information with geologic interpretations and a location map;
- Map of the glacial materials occurring at the land surface;
- Map of the bedrock types occurring at the surface of the bedrock;
- Closely-spaced cross-sectional views of the distribution of glacial materials between the land surface and the bedrock surface;
- Map of the elevation of the bedrock surface;
- Map of the thickness of glacial materials above the bedrock surface.

Tasks remaining include:

- Map or maps of the distribution of aquifers within the glacial materials;
- Digital surfaces for multiple sedimentary bedrock formations;
- CD or DVD with digital files of all the maps and databases and a GIS project to display and manipulate those maps and data;
- Printed copies of all the maps. These unfinished products will be created under our 2008 LCCMR grant.

The final outcome of completed county geologic atlases is an understanding of the distribution of aquifers and wells including how the aquifers are connected with each other, how they are connected to the land surface, and how they are connected to surface water features. Hydrologic maps and databases will be created by DNR Waters. The LCCMR funds were augmented with a matching grant of \$41,110 from the United States Geological Survey under the STATEMAP program.

Project Results Use and Dissemination

When the additional products for Benton and Chisago counties are complete (expected December 2009 using M.L. 2008 appropriation from the Environment and Natural Resources Trust Fund) a workshop will be arranged to present this work to local users, and to explain how it was created and how it might be applied to resource management. The MGS provides ongoing support of these products as well. Logical applications that have arisen already include the search for municipal well sites for the City of Foley, evaluation of the effects of quarrying on local ground water in Benton County, and an evaluation of the ground water implications of a proposed power plant in Chisago County. Draft versions of some products have already been distributed to parties involved in these issues. The digital versions of the products will be available on CD or DVD and from the website of the Minnesota Geological Survey, and 1,000 printed copies will be distributed to each county. The County Geologic Atlases are a well-known and well-used source of data and geologic interpretations for state and local agencies, consultants, well construction contractors, and citizens. Many of the elements of the atlases are specifically named in the data needs identified in sustainable ground water management plans under development in Minnesota. They are provided in formats appropriate for the complete spectrum of users, including those who don't use

computers through users that require digital files appropriate for modeling and simulation of the ground water system.

FINAL REPORT

Project completed: 6/30/2009

Minnesota's Water Resources: Impacts of Climate Change- Phase II

[Back to top of page](#)

Subd. 5k \$300,000

Lucinda Johnson

U of M - NRRRI
5013 Miller Trunk Highway
Duluth, MN 55811

Phone: (217) 720-4251

Email: ljohnson@d.umn.edu

Fax: (218) 720-4328

Web: <http://www.nrrri.umn.edu>

RESEARCH

Overall Project Outcome and Results

Minnesota's climate has become increasingly warmer, wetter, and variable, resulting in unquantified economic and ecological impacts. Our team assessed future climate scenarios, quantified hydrologic responses to past climate, conducted an economic analysis to assess implications of changing climate to water resources, and identified water quality and fish indicators of response that could be used for future monitoring. Specific products included:

- Data tools to extract and summarize historic climate data from the State Climatology Office database,
- A water quality reporting tool,
- Climate predictions to the end of the century,
- Assessment of economic impacts of climate change on fisheries and water resources,
- Recommendations of indicators for inclusion in future monitoring programs.

Our findings include the following:

- Temperature increases are projected to be greatest in the latter half of this century, with temperatures generally above 2°C above the average from 1950-1999.
- Precipitation is projected to increase on an annual basis, but will decrease or be unchanged during the growing season, resulting in drier growing conditions.
- Overall, water temperatures in streams are projected to increase between 3 and 5°C.
- Ice out dates were found to be occurring about 1.44 days earlier per decade since the 1950's, and trends for increasing air temperatures in the future imply further declines in ice-free days.
- Historic data were utilized to identify climate periods in the record that were extreme (either due to temperature or precipitation). These extreme periods were then used to assess possible water quality and fish responses during those periods. Indicators of water quality responses were identified (e.g., water clarity, surface water temperature, conductivity); no specific fish responses were detected.
- Walleye spawning dates are changing with ice out dates, and there is evidence that some fish species are expanding their distributions (especially largemouth bass, bluegill and black bullhead). Cisco (tullibee) abundance is declining in northern lakes.
- Water quality and biological indicators were recommended for future monitoring.

Individual project components show detailed analyses and results.

Project Results Use and Dissemination

Project team members and their collaborators have made numerous presentations to general audiences, to agencies, and at professional conferences. Additional outreach and communications products include:

- Data from Kristal Schneider's Master's thesis regarding the relationship between walleye spawning and ice out has been published in the Transactions of the American Fisheries Society 139(4):1198-1210.. <http://afsjournals.org/doi/abs/10.1577/T09-129.1>. Further publications are planned.
- A mapping tools was created to display trends for lakes having between 5 to >18 years of data. Because of the large number of options for analyzing this broad data set, a comprehensive subproject website was constructed to make the trend results available to other project scientists and ultimately others: (<http://mnbeaches.org/gmap/trendswebsite>). The website includes "processed raw" data, complete metadata, summary tables, links to Google Maps that identify sites with descriptive statistics, and graphs (box and whisker and regressions). The data are also incorporated into the larger

project database that is now being used for more detailed examinations of climatic associations, geographic patterns, size and depth patterns, and associations with fish, and ice cover data.

- The climate data retrieval tool, developed by the State Climatology Office, was essential to all climatic research undertaken in this project. The climate data retrieval tool enabled project participants to extract climate variables important to their own specific questions, at time and space scales they deem relevant. While the climate data retrieval tool is available to project investigators only at the present time, the Office of the State Climatologist plans to make it available widely to Minnesota resource managers and researchers at the conclusion of this project.
- A third product is an annotated bibliography for the economics of climate change and environmental quality.

FINAL REPORT

Associated Project Publications

Appendix A: Potential Impacts of Climate Change on Minnesota's Water Resources: An Economic Analysis

Appendix B: Economic Impacts of Global Climate Change on Minnesota Fisheries Through Decreases in Lake Ice

Appendix C: Annotated Literature Review of Economic Analysis of Water Impacts from Climate Change

Appendix D: Online Climatic Data Retrieval Tool

Appendix E: Minnesota Climate in Century 21

Appendix F: Ice-out timing trend analysis for Minnesota lakes 1948-2008

Appendix G: Annual Stream Runoff and Climate in Minnesota's River Basins

Appendix H: Projecting the Impact of Climate Change on Coldwater Stream Temperatures in Minnesota Using Equilibrium Temperature Models

Appendix I: Biological Indicators of Climate Change: Trends in Fish Communities and the Timing of Walleye Spawning Runs in Minnesota

Appendix J: Trend Analyses for Species of Concern: Analysis of CPUE Data for Walleye, Cisco, and Smallmouth Bass 1970-2008

Appendix K: Water Quality Responses During Historical Climate Regimes (Scenarios)

Project completed: 6/30/2010

Pharmaceutical and Microbiological Pollution

[Back to top of page](#)

Subd. 5I \$302,000

Timothy LaPara

U of M

500 Pillsbury Drive SE

Minneapolis, MN 55455

Phone: (612) 624-6028

Email: lapar001@umn.edu

Fax: (612) 626-7750

Web: <http://www.ce.umn.edu/people/faculty/lapara/index>

RESEARCH

Overall Project Outcome and Results

The goal of this project was to develop technologies that eliminate antibiotic-resistant bacteria, hormones, and other pharmaceutical compounds from Minnesota's surface waters. Laboratory-scale digesters were established in which wastewater solids were treated under both aerobic and anaerobic conditions at temperatures of 72°F, 98°F, 115°F, and 130°F. Our results demonstrated that aerobic digestion had no significant effect on the destruction of these genes; in contrast, the anaerobic digesters operated at 115°F and 130°F showed a very significant ability to reduce the quantities of these genes (with 130°F performing better than 115°F). This research demonstrates that anaerobic digesters treating wastewater solids (or agricultural manure) should be operated at the highest feasible temperature to help eliminate antibiotic resistance genes, which should help slow the proliferation of these organisms. In terms of antibiotic removal, the aerobic and anaerobic digesters were effective in the removal sulfamethoxazole, trimethoprim, and tylosin, with removal generally being greater at higher temperatures. Digestion did not lead to removal of the antibacterial triclosan or the estrogens tested. Laboratory and pilot-scale photolysis experiments revealed the compounds subject to direct photolysis (triclosan, tetracycline, tylosin) are likely to be amenable to degradation in wastewater treatment stabilization ponds or treatment wetlands. Cover materials either had minimal or inhibitory effects on photolysis rates. Two compounds (sulfamethoxazole and trimethoprim) were photodegraded more rapidly in wastewater effluent than in surface water or purified water, indicating that photodegradation is more likely to occur (and perhaps should be encouraged by design) in sunlit wastewater treatment process steps than in the environment. While solar photolysis shows some promise for treatment of pharmaceuticals, no evidence for removal of antibiotic resistance genes was in the photoreactor.

Project Results Use and Dissemination

This project has been used in numerous ways. First, we have communicated the results back to the State Legislature via informal (i.e., with individual State Senators and Representatives) and formal (i.e., hearings). Second, we have communicated these results to our various partners who operate municipal wastewater treatment facilities as well as other municipalities who operate municipal wastewater treatment facilities. Finally, we have disseminated our research results as broadly as possible, including via presentations at national and regional technical meetings as well as via publication in the peer-reviewed technical literature.

FINAL REPORT

Project due to be completed: 6/30/2010

Threat of Emerging Contaminants to Upper Mississippi Walleye

[Back to top of page](#)

Subd. 5m \$97,000

Heiko Schoenfuss

St. Cloud State University
720 Fourth Avenue South WSB-273
St. Cloud, MN 56301

Phone: (320) 308-3130

Email: hschoenfuss@stcloudstate.edu

Fax: (320) 308-4166

Web: <http://web.stcloudstate.edu/aquatictox/>

RESEARCH

Overall Project Outcome and Results

In this combined field and laboratory study we assessed whether populations of native walleye in the Upper Mississippi River experienced altered genetic diversity correlated with the exposure to estrogenic endocrine active compounds. We collected fin-clips for genetic analysis from almost 600 walleye (13 sites) and sub-sampled over 360 of these fish (6 sites) for blood and reproductive organs. We further enhanced our sample size by adding genetic data from over 900 walleye analyzed for previous studies. Finally, we caged male fathead minnows at three of the sample sites to confirm the presence of estrogenic endocrine active compounds. Our findings indicate that male walleye in four river segments produce measurable concentrations of plasma vitellogenin (an egg-yolk protein and, when expressed in male fish, a biomarker of acute estrogenic exposure), a finding consistent with the presence of estrogenic endocrine active compounds and consistent with published historical data for at least three of these study sites (Grand Rapids, Pool 2, Lake Pepin). Patterns of vitellogenin induction were consistent for native walleye and caged fathead minnows. No widespread occurrence of histopathological changes such as intersex was found. To assess the genetic diversity of the walleye populations at the study sites, we DNA fingerprinted individual fish using molecular genetic markers. Genetic differences were observed between populations, however, these differences were consistent with geographic distance between populations (greater geographic distance=greater genetic difference) with the largest observed difference in genetic diversity found between fish upstream and downstream of St. Anthony Falls (and/or Lock and Dam 1 of the Mississippi River), a historical barrier to fish movement. In summary, while the persistent occurrence of endocrine disruption in wild fish populations is troubling, this occurrence has not resulted in the degradation of reproductive organs in individual walleye or alteration in genetic diversity of walleye populations.

Project Results Use and Dissemination

Project results have been provided to the LCCMR on a semi-annual basis and in this final report. A related report on some of the genetic findings is also being prepared for the MN Department of Natural Resources. We plan to present the results of this study to the scientific community in form of a peer-reviewed manuscript in the near future. Furthermore, we will present our results to the regional scientific community and stakeholders at upcoming fisheries (i.e., Annual Meeting of the American Fisheries Society, Minnesota Chapter) and toxicological (i.e., Annual Meeting of the Society for Environmental Toxicology & Chemistry, Midwest Chapter) meetings. We have also provided limited project information on the website of the Aquatic Toxicology Laboratory at St. Cloud State University (<http://web.stcloudstate.edu/aquatictox/>) and will provide a more extensive review of the study after approval of the final report by the LCCMR.

FINAL REPORT

Project completed: 6/30/2010

Cedar Creek Groundwater Project using Prairie Biofuel Buffers

[Back to top of page](#)

Subd. 5n \$659,000

Clarence Lehman

U of M
1987 Upper Buford Cir
St. Paul, MN 55108

Phone: (612) 625-5734

Email: lehman@umn.edu

Fax: (612) 624-6777

Web: <http://www.cedarcreek.umn.edu>

RESEARCH**Overall Project Outcome and Results**

Two great environmental challenges ahead-for Minnesota and the world-concern water and energy. This project has gathered new information on how the production of bioenergy can simultaneously improve water quality in the state. It is one of an integrated suite of existing and proposed projects to understand the potential for bioenergy to help improve wildlife habitat, water quality, natural landscape management, electrical generation efficiency, climate, and the general ecological integrity of the landscape.

The project has established an "underground observatory" to monitor water and what it carries from the surface to our groundwater and aquifers below. The project examined water filtered by the soil and roots beneath three different potential bioenergy sources: prairie, hay, and corn.

As expected, the deep roots of restored native prairies were best at filtering nitrogen contaminants from water. In addition, a number of less expected discoveries of the project will help in future planning and development:

1. Water retention in the soils was poorest in corn and bare ground, intermediate in hay, and greatest in prairie.
2. Prairies did not significantly decrease the total quantity of water re-supplied to groundwater but improved its quality.
3. Nitrogen removed by prairie plants significantly increased the quantity of biofuel they produced while not reducing biodiversity.
4. Effects on levels of pharmaceutical contaminants is still under analysis.
5. Significant carbon sequestration occurred in prairie soils but not those of hay, corn, or bare ground.
6. The downward flow of dissolved substances through even sandy soils is much slower than expected.

The underground observatory is a valuable ongoing resource, with much remaining to learn. The project organizers will seek continued funding from various sources to enable further understanding of how we can sustainably inhabit our planet.

Project Results Use and Dissemination

We have a project website available through the Cedar Creek Natural History Area website (<http://www.cedarcreek.umn.edu>). Many public and private tours are conducted at Cedar Creek annually and the plots in the present study were featured among them during relevant tours. Visitors receive verbal and written descriptions of the research and its implications, including handouts and review of installed signage. Presentations (oral or poster) to special interest groups, research groups, and other interested parties were given by project collaborators throughout the duration of the project. Publication of the results in a peer-reviewed scientific journal will be completed after field data has all been collected, summarized, and analyzed.

FINAL REPORT

Project completed: 6/30/2010

Pyrolysis Pilot Project

Subd. 5o \$500,000

[Back to top of page](#)

Roger Ruan

U of M
Rm 206 BAE Bldg, 1390 Eckles Ave
St. Paul, MN 55108

Phone: (612) 625-1710

Email: ruanx001@umn.edu

Fax: (612) 624-3005

Web: <http://biorefining.cfans.umn.edu/home.php>

Overall Project Outcome and Results

Diversified perennial plants throughout watersheds in rural areas of Minnesota are a source of biomass feedstock which can

be converted biofuels while also producing ecosystem and water quality benefits. The nature of sporadic production of this biomass in lands away from power and convenient water supply requires conversion technologies to be mobile, portable, self energy sufficient, and water free. The goal of our project was to develop, build, and demonstrate a mobile microwave assisted pyrolysis system which can be operated on biomass production sites. The two specific aims of the project were: (1) developing water free microwave assisted pyrolysis (MAP) system for conversion of cellulosic feedstocks to biofuels, and (2) demonstrating the technology through outreach and communication. We first optimized the processes which we developed from our previous research. Based on the optimized processes, we designed and constructed our first generation pilot system. We then conducted a series of pilot scale experiments and identified technical and engineering problems. Finally we designed and built the mobile demo system. Our pilot scale system has been demonstrated to more than 300 people including university researchers, government officials, private interests, biomass feedstock producers, bioenergy producers, students, and investors. The mobile system has been tested on the manufacture site and further testing will occur in Minnesota at the University of Minnesota's UMore Park. The technology developed was presented to a broader audience through more than 15 outreach events. Nine (9) peer-reviewed papers have been published and over 30 presentations and reports were made to the public. Our co-PI's company Rural Advantages also developed and offered numerous educational outreach and demonstration events totaling over 78 events with 285 speakers and reaching at least 5,410 attendees.

Project Results Use and Dissemination

Information obtained from the project was disseminated through demonstration of the static pilot scale system, outreach and educational events, and peer-reviewed publications. The results have successfully reached a wide range of audience including university researchers, government officials, private interests, biomass feedstock producers, bioenergy producers, students, and investors. A number of publications have aroused strong interests from investors. The project also led to efforts to seek additional funding to support work which will employ the new technology and system developed through this project.

FINAL REPORT

Project completed: 6/30/2010

Subd. 6 Natural Resource Information

Minnesota County Biological Survey

Subd. 6a \$1,500,000

[Back to top of page](#)

Carmen Converse

DNR

500 Lafayette Rd

St Paul, MN 55155

Phone: (651) 259-5083

Email: carmen.converse@dnr.state.mn.us

Fax: (651) 296-1811

Web: <http://www.dnr.state.mn.us/eco/mcbs/index.html>

Overall Project Outcome and Results

This appropriation continued and accelerated the ongoing Minnesota County Biological Survey (MCBS), which identifies significant natural areas and systematically collects and interprets data on the distribution and ecology of native plant communities, rare plants, and rare animals. The information gathered by MCBS serves as a foundation for the conservation of critical components of Minnesota's biological diversity through ecological monitoring, environmental review, planning, and critical habitat protection.

In this phase of the MCBS, surveys were completed in Hubbard, Wadena, Itasca, Lincoln, Murray, Cottonwood, Jackson, Watonwan, and Martin counties. Surveys were accelerated in the Border Lakes and Nashwauk ecological subsections. Since 1987, MCBS has added 17,054 new rare feature records to DNR's Rare Features Database. Over 47,000 polygons of native plant communities and over 7,000 MCBS site polygons are available to external customers on DNR's "Data Deli", including MCBS sites of biodiversity significance. Aquatic plant data have been collected from 1,528 lakes.

New locations of animal species documented during this period included Prairie Vole, Chestnut-collared Longspur, Black-throated Blue Warbler, and Four-toed Salamander. Plants documented included *Najas guadalupensis* var. *olivacea*, a Great Lakes endemic aquatic plant and *Carex supina*, a cliff-dwelling sedge last observed in Minnesota in the 1930's. Sioux quartzite rock outcrop surveys yielded nearly 100 new records of rare plants. Since 1987, Twenty-one species and one hybrid not previously documented in Minnesota were recorded, with a 2008 addition of the aquatic plant *Potamogeton confervoides*.

Project Results Use and Dissemination

Data delivery and technical assistance were provided as related to:

- Forest certification
- DNR and US Forest Service forest planning
- Peatland management planning
- State land exchanges
- Woody and grasslands biomass guidelines
- Off Highway Vehicle guidelines
- State Wildlife Action plan implementation
- Quality lake identification
- Forest legacy projects
- Landscape collaborative planning
- Lake and native prairie monitoring
- Native prairie bank
- Updates to the state lists of rare species and calcareous fens.

Locally, aquatic plant data were delivered to lake associations, staff led field trips for county residents, and training sessions in plant community and plant identification. The publication, Native plant communities and rare species of the Minnesota River Counties was well-received by communities bordering the river corridor.

MCBS provided ecological evaluations for Franconia Bluffs, Seminary Fen, Butternut Valley Prairie, and Langhei Prairie that have since become Scientific and Natural Areas.

A statewide web map of the current extent of native prairie as compared to 100 years ago informs prairie ecosystem conservation planning. Another product is an easily downloaded booklet of the Ecological Systems in the Laurentian Mixed Forest Province.

Several MCBS related articles have been published in the *Minnesota Conservation Volunteer*; examples include "Elusive orchids" and "Rock pools on the prairie".

FINAL REPORT

Project completed: 6/30/2009

Soil Surveys

Subd. 6b \$400,000

[Back to top of page](#)

Greg Larson

Board of Water and Soil Resources
520 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 296-3767

Email: greg.larson@bwsr.state.mn.us

Fax: (651) 297-5615

Web: <http://www.bwsr.state.mn.us>

http://soils.usda.gov/survey/printed_surveys/state.asp?state=Minnesota&abbr=MN

Overall Project Outcome and Results

In the ongoing multi-year process to map, classify, interpret and Web-publish an inventory of the soils of Minnesota, this two-year phase of the project focused on accelerating the completion of soil mapping, developing new soil interpretations and developing linkages of soils data with other related natural resources data. Specifically:

- 165,000 acres were addressed in Crow Wing County resulting in a digital soil survey for a portion of Crow Wing County, the Glacial Lake Brainerd area, to be released in the fall of 2009;
- 80,000 acres were addressed by NRCS soil scientists in Koochiching and Saint Louis Counties, resulting in soil mapping for Koochiching County being completed one year ahead of schedule;
- Soil productivity indices for cropland and forests were developed for 84 and 19 counties, respectively, in order to replace the outmoded Crop Equivalent Ratings (CER);
- Web-based decision support system was developed that integrates soils data with other natural resources data;
- Support was provided for the University of Minnesota Land Economics website to better complement USDA Web Soil Survey interpretations;

- Six counties (Cass, Carlton, St. Louis-Duluth subset, Lincoln, Scott and Benton) were digitized and posted on the Web Soil Survey bringing the total to 81 survey areas.

Two key lessons were learned during this 2007 phase that were incorporated into the on-going 2008 and 2009 project. The use of current NRCS employees brought to Minnesota on a work assignment ("detailees") is an efficient way to increase the completion of soil surveys after the initial investigative phase has been completed and a mapping legend has been developed. Additionally, we have determined that the USDA Web Soil Survey system is effective and sufficient for Web-publishing of Minnesota's soil survey data, so an independent system does not need to be developed by the state.

Project Results Use and Dissemination

Digital data through the WEB Soil Survey <http://websoilsurvey.nrcs.usda.gov> are available for 83 project areas (Two additional survey areas have been completed with 2008 funds). Soil interpretations such as soil erosion and forest productivity indices are available at the University of Minnesota Land Economics Website <http://www.landeconomics.umn.edu> Soils data for areas not yet mapped and digitized are available to the public on a request basis.

FINAL REPORT

Project completed: 6/30/2009

Field Guide for Evaluating Vegetation of Restored Wetlands

[Back to top of page](#)

Subd. 6c \$53,000

Paul Bockenstedt

Bonestroo, Rosene, Anderlik, & Assoc., Inc.
2335 W Hwy 36
St. Paul, MN 55113

Phone: (651) 604-4812

Email: pbockenstedt@bonestroo.com

Fax: (651) 636-1311

Web: <http://www.bonestroo.com>

Overall Project Outcome and Results

Wetland mitigations in Minnesota are expected to be required to meet minimum native vegetation requirements for approval in the near future. The *Minnesota Field Guide to Wetland & Buffer Plant Seedlings* was developed as an easy-to-use guide to assist in evaluation of the quality of vegetation in wetland restorations in Minnesota.

Bonestroo staff gathered necessary graphic resources for the guide and met with BWSR and MPCA staff to discuss and refine the project layout and contents. Bonestroo graphic designers developed a layout template for the guide. Plant drawings and art were purchased from artist Mark Muller, and additional photos/graphics for native plant seeds and seedlings gathered by Bonestroo staff. Michael Bourdaghs of MPCA assisted with preparation of an abbreviated description of the Floristic Quality Assessment Index (FQAI) process for inclusion as the field methodology for evaluating wetlands.

A total of 2,450 guides were printed (original proposed 2,000) by Modern Press of St. Paul following a competitive bid process. These were distributed to a variety of state and county agencies, as well as federal agencies with Minnesota offices, professional organizations, and educational groups/institutions. A small number of printed guides and the final print-ready version of the guide were provided to Dan Shaw of BWSR. This project created the first guide of its kind for identifying wetland plants, their seeds and seedlings, as well as information on the wetland vegetation evaluation methodology being developed by MPCA. Printed guides were distributed to wetland professionals through a broad network of groups, professional organizations, and local, state and federal agencies. The *Minnesota Field Guide to Wetland & Buffer Plant Seedlings* is also available as a free of charge downloadable PDF on Bonestroo's website at <http://www.bonestroo.com>. It is also available to State agencies for posting to their websites, should they choose to do so in the future.

Project Results Use and Dissemination

The *Minnesota Field Guide to Wetland & Buffer Plant Seedlings* is being used as both a printed and online resource by wetland professionals. The guide has been distributed at wetland delineators training sessions, as well as by other wetland and natural resource professional groups. The guide is intended to be a supporting reference for plant identification for the wetland evaluation methodology (FQAI) being developed by the Minnesota Pollution Control Agency. This MPCA-developed methodology is anticipated for completion in 2010. The Guide to Minnesota Wetland and Buffer Plant Seedlings is being promoted both through word of mouth, as well as announcements at meetings, workshops, and conferences, by Bonestroo, agency, and nonprofit staff. A distribution list for printed guides was provided to LCCMR staff along with the final project report in July/August 2009.

Project Publication: Minnesota Field Guide to Wetland & Buffer Plant Seedlings**FINAL REPORT****Project completed:** 6/30/2009

Appropriation titled "Natural Resources Data Collection and Mapping" BECAME:[Back to top of page](#)**DataWorkshop: Democratizing access to Minnesota's data assets - a user friendly data integration and visualization tool**

Subd. 6d \$49,000

Terry Brown

Natural Resources Research Institute, University of MN
5013 Miller Trunk HWY
Duluth, MN, 55811

Phone: (218) 720-4345**Email:** tbrown@nrri.umn.edu**Fax:** (651) 296-1321**Web:** <http://gisdata.nrri.umn.edu/Tracker/DataWorkshop/>**Overall Project Outcome and Results**

Originally developed to facilitate the work behind the Statewide Conservation and Preservation Plan, the DataWorkshop is a tool that allows users to combine and cross reference existing GIS datasets to synthesize new information. The DataWorkshop is now available for use by other users such as the public, municipalities, non-profits, and state and county agencies. The ability to integrate existing datasets through a web browser without the need for additional software and with only a basic computer background makes the tool unique. Users previously lacking any such capability are enfranchised and users with GIS resources may find DataWorkshop simpler and more efficient for some analysis tasks.

For example, a user may wish to produce a map of all the lakes larger than 100 acres in the western prairie habitat zone. The user would use this system to select the DNR's lake and habitat zone datasets, select from the lake dataset those lakes with an area greater than 100 acres, and from that subset, only those lakes which overlap the prairie habitat zone.

The project has used free (open source) software technologies to minimize the cost associated with hosting this service on the web. These include UMN-Mapserver, Postgis, and Python. NRRI will temporarily host a demonstration site to allow interested parties to evaluate the system and until a permanent location is determined on a Minnesota state agency website. The project will also be promoted at the upcoming MN GIS/LIS Consortium conference. Although projects of this kind can only be truly evaluated by their long term adoption and use, we are hopeful that this work has been a valuable step towards democratizing access to Minnesota's data assets.

Project Results Use and Dissemination

At the time of writing we are in the final stages of releasing the project, which we will promote through our contacts with agencies, potential users, and the MN GIS/LIS Consortium conference in Duluth in October.

NRRI will host a demonstration version of the website at <http://gisdata.nrri.umn.edu/Tracker/DataWorkshop/> - this site should be available starting Jan. 1 2010 when a necessary server upgrade is complete.

FINAL REPORT**Project completed:** 6/30/2009

Subd. 7 Establishment of an Emerging Issues Account**Emerging Issues Account**

Subd. 7 \$160,000

[Back to top of page](#)**John Velin , Director**

LCCMR
100 Rev. Dr. Martin Luther King Blvd.

Rm 65 State Office Bldg
St. Paul, MN 55155

Phone: (651) 296-2406
Email: lccmr@lccmr.leg.mn
Fax: (651) 296-1321
Web: <http://www.lccmr.leg.mn>

Emerging Issues Account

WENT TO:

Statewide Conservation and Preservation Plan (SCPP) - \$147,000

<http://www.mnconservationplan.net>

The Trust Fund funded Statewide Conservation and Preservation Plan (SCPP) is a collaborative effort providing a long term vision and guide for Minnesota's environment and natural resources. This funding continues and expands this effort by enabling the SCPP team to do additional more in-depth analysis on transportation and mercury issues in Minnesota.

Project completed: 6/30/2009

and

Statewide Ecological Ranking Conservation Reserve Program (CRP) and Other Critical Lands - \$13,000 (completion date for this portion is 6/30/2009)

Other funds include:

M.L. 2008, Chp. 367, Sec. 2, Subd. 7 "Emerging Issues Account" - \$155,000 (completion date for this portion is 6/30/2010)

M.L. 2009, Chp. 143, Sec. 2, Subd. 4g "Statewide Ecological Ranking of Conservation Reserve Program (CRP) and Other Critical Lands" - \$107,000 (Project due to be completed: 6/30/2011)

Project due to be completed: 6/30/2011

Project due to be completed: 6/30/2011

2006 PROJECTS

MN Laws 2006, Chapter 243, Section 19 & Section 20 (beginning July 1, 2006)

Fish and Wildlife Habitat

Land Exchange Revolving Fund for Aitkin, Cass, and Crow Wing Counties

[Back to top of page](#)

Section 20, Subd. 08 \$290,000

Mark Jacobs

Aitkin County
209 - 2nd Street NW
Aitkin, MN 56431

Phone: 218-927-7364**Fax:** 218-927-7249**Email:** mjacobs@co.aitkin.mn.us**Web:** <http://www.co.aitkin.mn.us>

To establish a six-year revolving loan fund for Aitkin, Cass, and Crow Wing Counties to improve public and private land ownership patterns, increase management efficiency, and protect critical habitat.

Project due to be completed: 6/30/2011

Water Resources

Lake Superior Research

[Back to top of page](#)

Section 20, Subd. 06 \$295,000 (\$267,000 TF + \$28,000 GLP)

Steven M. Colman

Large Lakes Observatory, UMD
2205 E. 5th Street
Duluth, MN 55812

Phone: 218-726-8128**Fax:** 218-726-6979**Email:** scolman@d.umn.edu**Web:** <http://www.d.umn.edu/llo>

RESEARCH

Overall Project Outcome and Results

There is a surprising lack of study and understanding of the ecosystems of the Great Lakes and their properties, especially in the deepwater basins. We know more about many marine systems than we know about the Great Lakes. With current concerns about the environmental health of the Great Lakes, studies supported through this project aimed to contribute to alleviating some of the unknowns. A series of studies were conducted that research the condition, functioning, and processes of Lake Superior, its sediments, and its ecosystem including:

- Studies related to the entire living ecosystem, from top predator fish down to picoplankton.
- Studies of the circulation of the lake using numerical models and oceanographic instrumentation.
- Studies of the water column including the balance between CO₂ production and oxygen consumption, the processes related to the fate of organic matter and nutrients, and the effect of these and other water column processes on primary producers.
- Studies of the transport and delivery of organic and inorganic materials to the lake floor as sediments that accumulate in deep waters of the lake and the erosion, transport, and storage of coarse-grained sediment in coastal waters.

In all of these studies, we took a holistic, "physics to fish" approach, examining the interactions between physical and biological processes.

We conducted a total of 24 field projects, with project funds going primarily to the cost of using of our research ship for an aggregate of 53 days at sea. Project funds leveraged other funding as most of these studies were small pilot projects, extensions to projects funded from other sources, and projects to collect preliminary data often required for proposals to the national science agencies. The projects have a common theme of understanding the dynamics of Lake Superior, its

sediments, and its ecosystem. Through these studies, we hope to provide Minnesotans, from lay citizens to environmental managers, a better understanding of how Lake Superior works and how it might change in response to climate change and human activity.

Project Results Use and Dissemination

We have now collected a wealth of environmental data for Lake Superior. A significant part of those data have already been used for larger research proposals to the National Science Foundation and other agencies, some of which have already been successful in bringing new federal funding into the state. Plans are for the results of studies supported through this project to be published in peer-reviewed journals where they will be available to Minnesota managers and regulators. With other funding, we are in the process of developing a system called the Global Great Lakes Data and Modeling Center, which will allow incorporation and assimilation of existing data, new data like those collected in this project, and ongoing real-time observational data. The Data and Modeling Center will allow numerical models to be run and compared in real time using the different data sets and make all data readily available through an internet interface.

FINAL REPORT

Project completed: 6/30/2009

Impacts on Minnesota's Aquatic Resources from Climate Change

[Back to top of page](#)

Section 20, Subd. 07 \$250,000

Lucinda Johnson

UMD - Natural Resources Research Institute
5013 Miller Trunk Hwy.
Duluth, MN 55811

Phone: 218-720-4251

Fax: 218-720-4328

Email: ljohnson@nrri.umn.edu

Web: <http://www.nrri.umn.edu/cwe/staff/ljohnsonintro.htm>

RESEARCH

Overall Project Outcome and Results

This project examined historic climate records and developed a database on key climatic measures and their variability. We also analyzed hydrologic (e.g., streamflow, lake levels, water quantity and quality) and ecological response data (e.g., fish species distributions, walleye spawning phenology). We found that the following trends are evident:

- Temperatures are increasing throughout the state but changes are greater in the northern third. Changes have accelerated since the 1980s, with greater increases in night time temperatures and in the winter.
- Precipitation in the form of both rain and snow has been increasing since the 1930s, although there is variation across the state.
- Lake evaporation is increasing in some regions but not others. Trends in lake levels are not consistent across the state: some regions show large and significant increases in lake levels, while other regions show no significant trend.
- Stream flows are generally increasing, especially in the south to central part of the state.
- Review of historic ice out data show a trend towards earlier ice out dates across the state. Walleye spawning dates are correlated with ice out date. There is some evidence that fish communities are also changing.
- A sizeable fraction of lakes with many years of data indicated a warming of surface waters. Other trends, found in a smaller fraction of lakes, suggest that the summer thermocline of lakes is becoming somewhat more stable consistent with the warming trend.
- A substantial fraction of lakes in the data set also showed increases in various measures of salinity that are consistent with increased warming and increased watershed loading from stormwater and de-icing salts.
- An interesting trend, likely unrelated to climate, is an increase in water clarity of lakes, and a decline in associated nutrients and chlorophyll-a.

Several tools for downloading and visualizing results have been developed. Additional analyses are ongoing.

Project Results Use and Dissemination

Results of these analyses have been presented in various venues, including:

1. Johnson, L.B. Climate change and Minnesota's aquatic ecosystems. Science Museum of Minnesota, Thursday Evening Lecture Series. Exploring Water. 9 April 2009.
2. Johnson, L.B. Climate change and Minnesota's Aquatic Resources. Symposium. Minnesota Waters, Rochester, MN. May 2009.
3. Johnson, L.B. Adapting to climate change in Minnesota. Invited presentation to Minnesota Pollution Control Agency- Committee to evaluate adaption to climate change in Minnesota. 1 September 2009.

4. Schneider, K.N., D.L. Pereira, V. Card, R.M. Newman, and S. Weisberg. Timing of walleye spawning runs as an indicator of climate change. 138th Annual Meeting of the American Fisheries Society, Ottawa, ON, Canada. 20 August 2008.
5. Schneider, K.N. Timing of walleye spawning runs as an indicator of climate change. Conservation Biology Seminar Series, University of Minnesota, Saint Paul, MN. 16 September 2008.

Project results have been eagerly awaited by numerous agencies and committees working on statewide strategies for assessing adaptation to climate change. Dr. David Thornton invited Lucinda Johnson to present this project's findings to a newly convened committee to address adaptation strategies across state agencies. Results will also be used to inform a newly funded project to quantify impacts of climate change and land use change on cisco habitat (i.e., coldwater lake) in the glacial lakes region of the Midwestern US. In addition, several scientific publications are planned based on results of these analyses.

FINAL REPORT

ASSOCIATED PROJECT PUBLICATIONS:

Appendix A: Timing of Walleye Spawning as an Indicator of Climate Change

Appendix B: Minnesota lake water quality on-line database and visualization tools for exploratory trend analyses

Appendix C: Lake Level Response to Climate in Minnesota

Appendix D: Lake Evaporation Response to Climate in Minnesota

Appendix E: Stream Flow Response to Climate in Minnesota

Appendix F: Minnesota lake water quality on-line database and visualization tools for exploratory trend analyses

Appendix G: Symposium

Project completed: 6/30/2009

Environmental Education

Enhancing Civic Understanding of Groundwater

[Back to top of page](#)

Section 20, Subd. 02 \$150,000

Patrick Hamilton

Science Museum of Minnesota

120 W. Kellogg Blvd.

St. Paul, MN 55102

Phone: 651-221-4761

Fax: 651-221-4514

Email: hamilton@smm.org

Web: <http://www.smm.org>

Overall Project Outcome and Results

Ground water is a resource in great and growing demand in Minnesota. Yet many citizens are unaware of the links between land use and ground water and the interconnections between ground water and surface water. The Science Museum of Minnesota, with the help of many partners, created outdoor ground water exhibits for visitors to the Museum and a ground water classroom program for delivery to schools throughout Minnesota.

The creation of the Ground Water Plaza in the Science Museum of Minnesota's outdoor science park, the Big Back Yard, significantly leveraged resources provided by LCMR. The Minnesota Ground Water Association provided \$20,463 to drill the artesian well that provides the water for the ground water exhibits. A gift of \$10,000 from the Toro Giving Program and in-kind donations from numerous entities also helped make the Ground Water Plaza possible.

Since its opening in August 2007, the Ground Water Plaza has become one of the key educational attractions in the Big Back Yard. About 40,000 people visit the park each summer season. The Big Back Yard and the Ground Water Plaza have become so popular as a destination for field trips that the Museum now sets aside two full weeks each September for exclusive use of the park by schools.

The Ground Water Classroom Program began visiting schools throughout Minnesota in spring 2008. The program reached a total of 50 schools and 7,324 students through spring 2009. Although the LCMR project, Enhancing Civic Understanding of Ground Water has concluded, the ground water classroom program will continue to be offered to schools. It is now included under the Water Residency heading on Science Museum of Minnesota's residency program website - <http://www.smm.org/schools/atyourschool/residencies/>.

Project Results Use and Dissemination

The Science Museum and the American Museum of Natural History in partnership produced an internationally traveling exhibit about water that opened in New York City in November 2007. Two Ground Water Plaza outdoor exhibit components

were modified for indoor use and replicated for inclusion in the 7,000 square-foot water exhibition. The National Ground Water Association provided \$54,000 to cover the cost of building these two ground water components. Two copies of the Water exhibition with its ground water components were produced - one to tour North American venues and the second for overseas venues. To date, 712,000 people have seen the Water exhibition with its ground water components and several million more will as the show continues to tour for several more years.

FINAL REPORT

Project completed: 6/30/2009

2005 PROJECTS

Subd. 05 Fish and Wildlife Habitat

Integrated and Pheromonal Control of Common Carp

[Back to top of page](#)

Subd. 05g \$550,000

Peter Sorensen

U of M
1980 Folwell Ave.
St. Paul, MN 55108

Phone: (612) 624-4997**Email:** soren003@umn.edu**Fax:** (612) 625-5299

RESEARCH

Overall Project Outcome and Results:

The common carp (*Cyprinus carpio*) is an invasive fish that has dominated our shallow lake ecosystems for the past century and caused enormous damage to their water quality, plants, waterfowl and fisheries. The overarching goal of this project was to develop guidelines for an integrated control scheme for the common carp based on its life history and reliance on pheromones (species-specific chemical signals). The possible use and identity of a female pheromonal attractant was studied in the laboratory while the reproductive habits of carp in the field were documented to determine how these traits might be targeted for control. Basic elements of carp biology were also examined to produce a statistical model that explored carp population dynamics and control strategies. Several key discoveries were made. First, behavior tests combined with chemical analysis confirmed the presence of a highly attractive, male-derived sex pheromone. This cue has polar and non-polar components with androstendione serving as a key component. While the presence of androsetendione causes the pheromone to attract sexually-active carp, the other components also serve as a strong species-specific signal that attracts all life stages and thus have potential for application. Detailed studies of carp spawning for two years demonstrated that while females prefer to spawn in fine-leafed, shallow vegetation in the spring and aggregate in the winter, removal schemes are possible. Lastly, a study of carp population dynamics discovered that while carp are mobile (they migrate into spawn each year), long-lived (over 50 years), fecund (females have up to 3 million eggs), but their young rarely survive. Further, larval survival only occurs in shallow, interconnected wetlands in years following severe winter-kills after which predatory native fish are not present: it appears that game-fish can control carp. This discovery was confirmed by modeling and demonstrates that carp control likely is feasible using an integrated scheme.

Project Results Use and Dissemination

The results of this project are being used by two large watershed districts (Riley Purgatory Creek, Ramsey Metro Washington) to study and start experimental projects to control carp. Both districts are contributing to the costs and are using techniques from this project. In addition, we are speaking with and advising at least half a dozen other groups on this topic across the state. The DNR is consulting with us. Late summer we disseminate our findings at the National Meeting of the American Fisheries Society where we have organized an entire day-long symposium on carp control. Since the inception of the study, we have been giving 4-8 public talks a year on carp to various groups including watersheds. Our results have been covered by both the Star Tribune and Pioneer Press, The Chanhassen Villager, and Outdoor News; Kare11 TV and the syndicated TV show "Minnesota Bound" have done shows on us; and we were covered twice by NPR. Two peer reviewed publications are in press with four others in preparation.

FINAL REPORT

Project completed: 06/30/2008

Subd. 06 Recreation

Metropolitan Regional Parks Acquisition, Rehabilitation and Development

[Back to top of page](#)

Subd. 06e \$2,000,000

Arne Stefferud

Metropolitan Council
230 E. 5th Street
St. Paul, MN 55101

Phone: (651) 602-1360
Email: arne.stefferud@metc.state.mn.us
Fax: (651) 602-1467
Web: <http://www.metrocouncil.org>

Overall Project Outcome and Results:

This appropriation leveraged \$1,333,000 of Metropolitan Council bonds and \$701,000 of 2005 State bonds in grants from the Metropolitan Council to regional park agencies to accomplish the following:

- Acquire 567 acres in 4 parks (0.8 acre for Long Lake Regional Park in Ramsey County , 543 acres for Rice Creek Chain of Lakes Park Reserve in Anoka County , 18.6 acres for Lake Waconia Regional Park in Carver County , and 5 acres for Big Marine Park Reserve in Washington County).
- Acquire a permanent trail easement from Burlington Northern Railroad for a 0.8 mile of right-of-way for the Bruce Vento Regional Trail in Ramsey County.
- Partially finance trail and shoreline rehabilitation at Lake of the Isles in Minneapolis.
- Replace 4 pit toilets with sewer-served restrooms for picnic areas at Keller Regional Park in Ramsey County.
- Rehabilitate 0.7 miles of separated bike/pedestrian trails, lighting and landscaping along East Lakeshore Drive at Como Regional Park in St. Paul.
- Build 2 classrooms, storage and reception areas for a visitor center at Gale Woods Special Recreation Feature in Three Rivers Park District.
- Design/engineering for 1.5 miles of North Urban Regional Trail in Dakota County.
- Build a picnic shelter at the Sucker Lake portion of Grass-Vadnais Regional Park in Ramsey County.

A partial extension to the appropriation timeline is allowing Anoka County to use \$524,000 remaining from a land acquisition grant to match \$1,050,000 of Federal Transportation Enhancement grant funds to construct two linked sections of the Rice Creek North Regional Trail within Rice Creek Chain of Lakes Park Reserve that totals 4 miles.

Project Results Use and Dissemination:

The parks and trails where these projects are located had 9,233,000 visits in 2007, which was 28% of all visits to the Metropolitan Regional Park System in 2007.

Each regional park agency that received a grant or grants from this appropriation informs the public about the land acquisition, or new or rehabilitated park facilities with its own website and news releases. The Metropolitan Council also publishes a "Regional Parks Directory and Map" that informs the public about the recreation activities available at each regional park and trail and includes website addresses and phone numbers for each park agency for more information. Finally, the Metropolitan Council's website includes an interactive parks map that contains the same information as the paper version of the "Regional Parks Directory and Map" at <http://www.metrocouncil.org/parks/r-pk-map.htm>

Project completed: 12/31/2010

Gitchi-Gami State Trail

Subd. 06f \$500,000

Kevin Johnson

DNR
1568 Hwy #2
Two Harbors, MN 55616

Phone: (218) 834-6240
Email: kevin.johnson@dnr.state.mn.us
Fax: (218) 834-6639

To design and construct approximately two miles of Gitchi-Gami state trail segments.

Project due to be completed: Open through timeframe of federal match funding

The Casey Jones State Trail

Subd. 06g \$1,200,000

Michael Salmon

DNR - Trails & Waterways
1756 County Road 26

[Back to top of page](#)

[Back to top of page](#)

Windom, MN 56101

Phone: (507) 831-2900, x-225

Email: michael.salmon@dnr.state.mn.us

Fax: (507) 831-2921

Overall Project Outcome and Results

This project expanded and further developed the Casey Jones State Trail in southwestern Minnesota. Development included bituminous paving of five miles of existing state owned trail corridor in Pipestone county, along with construction of two trail bridges. Acquisition from willing sellers added one and a half miles of state owned trail corridor and also preserved 180 acres of remnant native prairie/oak savanna on the banks of Plum Creek in Murray County. The parcels acquired include:

- Eunice Anderson Living Trust: 19.58 acres (1 mile of trail corridor)
- Ralph Manwarren Estate: 180 acres (1/2 mile of trail corridor & remnant prairie)

The Anderson acquisition was significant because it extended one mile west the Lake Wilson segment of state owned trail corridor, reducing the gap to 3 miles between the Lake Wilson and Pipestone county trail corridor. The Manwarren acquisition on Plum Creek will serve as a significant trail foundation as we acquire trail corridor southwest to Lake Shetek State Park, and northeast to Plum Creek County Park near Walnut Grove.

Project Results Use and Dissemination

DNR Trails & Waterways in conjunction with Friends of the Casey Jones Trail Association and the City of Pipestone held a Grand Opening Trail Dedication on July 10th, 2008, celebrating the development of the first five miles of trail. Updated information on acquired parcels and trail development is published on DNR trail maps & the DNR website.

FINAL REPORT

Project completed: 06/30/2009

Paul Bunyan State Trail Connection

Subd. 06h \$400,000

[Back to top of page](#)

Tony Walzer

DNR - Bemidji

6603 Bemidji Ave. North

Bemidji, MN 56601

Phone: (218) 308-2379

Email: tony.walzer@state.mn.us

Fax: (218) 755-4063

Overall Project Outcome and Results

The City of Bemidji acquired approximately 7.42 acres of land in the Wye area from Burlington Northern Santa Fe Railway. The DNR acquired approximately 4 acres of the Wye area from the City for \$845,000. \$400,000 from the Environment and Natural Resources Trust Fund was used to acquire the portion of the Wye area needed for the Paul Bunyan State Trail corridor from the City. The DNR used 2006 bonding funding to supplement the acquisition of this property.

The Wye area will be used to accommodate the trail corridor and future trail bridge over TH 197, along with trail amenities such as a parking lot and rest area. The City of Bemidji and DNR will continue to work together to cooperatively develop this area. Additional property rights will need to be acquired from the City, as it continues to work with CP Railway and Burlington Northern Santa Fe Railway and other residential property owners along the trail route. The Wye area corridor will connect the south lake Bemidji area trail corridor to the Clausen Avenue trail corridor.

This land acquisition and future trail construction will help to provide a major connection for the trail through the City and an amenity to the City's south shore economic development project. Future funding will be required to construct a bridge over TH 197. Once these projects are completed, a continuous paved trail will be provided from Lake Bemidji State Park to Crow Wing State Park.

Project Results Use and Dissemination

Information about the project has primarily been disseminated through the local media in relation the City's south shore development project. The Bemidji City Manager and City Council used this information as part of their overall development project, since the City was relying on the DNR acquisition funds to help with their south shore development project.

No articles appeared in the paper specific to the DNR acquisition of the City property, except for when the project was referenced in relation to the City's overall development project and reliance on the acquisition funds as part of that project. Once the trail is constructed, a news release will be submitted indicating the funding sources for the acquisition and construction.

An article did appear in the Bemidji Pioneer on August 13, 2008, pertaining to an LCCMR visit to Bemidji to get an update on the project, along with others in the area. See attached article for details.

FINAL REPORT

Project completed: 06/30/2010

Local and Regional Trail Grant Initiative Program

[Back to top of page](#)

Subd. 06l \$700,000

Andrew Korsberg

DNR

500 Lafayette Rd.

St. Paul, MN 55155

Phone: (651) 259-5642

Email: andrew.korsberg@dnr.state.mn.us

Fax: (651) 297-5475

To provide matching grants to local units of government for the cost of acquisition, development, engineering services, and enhancement of existing and new trail facilities.

Project due to be completed: 06/30/2011 (Extended due to availability of Federal grant)

Mesabi Trail

[Back to top of page](#)

Subd. 06m \$1,000,000

Bob Manzoline

St. Louis/Lake Counties Reg. Railroad Authority

801 SE Hwy 169, suite #4

Chisholm, MN 55719

Phone: (218) 254-2575

Email: bob.manzoline@ironworld.com

Fax: (218) 254-7972

To acquire and develop segments of the Mesabi Trail.

Project due to be completed: Open through timeframe of federal match funding

Land Acquisition, Minnesota Landscape Arboretum

[Back to top of page](#)

Subd. 06p \$650,000*

*An equal match of non-state dollars was required for this project.

Peter Olin

U of M - MN Landscape Arboretum

3675 Arboretum Drive

Chaska, MN 55318

Phone: (952) 443-1412

Email: peter@arboretum.umn.edu

Fax: (952) 443-2946

Overall Project Outcome and Results:

A 90-acre parcel within the boundaries of the Minnesota Landscape Arboretum was acquired on September 22, 2009 by

combining these Environment and Natural Resources Trust Fund (ENRTF) funds with funds from a ML 2003 ENRTF appropriation. This particular land acquisition concluded a 25 year long process to acquire this parcel. The acquisition provides an internal connection to the Horticultural Research Center and adds to the Arboretum additional big woods, high quality wetlands, prairie remnants, oak savanna, and valuable tillable land for future research and education programs.

A master planning effort by the Minnesota Landscape Arboretum determined that, to a great extent, the Arboretum's watershed follows the surrounding roadways. By purchasing lands within the roadways, the Arboretum aims to secure approximately 90 - 95% of its watershed, control adjacent development, preserve a major part of the ecosystem in the Chanhassen/Victoria/Chaska area, and make the area accessible to the general public.

The Arboretum's planning efforts identified 278 acres of lands to acquire. With the 90 acres added through this project, to date, 241 of the identified acres have been acquired and 37 acres of in-holdings remain left to purchase. This progress has been made possible by \$2.38 million from the Environment and Natural Resources Trust Fund along with \$2.38 million in privately-raised matching funds.

Project Results Use and Dissemination:

Information about this purchase and the ENRTF funding support will be disseminated through Arboretum publications and through information resources at the University Of Minnesota.

FINAL REPORT

Project completed: 06/30/2009

Subd. 07 Water Resources

Improving Water Quality on the Central Sands

Subd. 07i \$587,000

[Back to top of page](#)

John Moncrief and Carl Rosen

University of Minnesota

University of MN, 1991 Upper Buford Circle, Dept. Soil, Water & Climate

St. Paul, MN 55108

Phone: (612) 625-2771

Email: moncr001@umn.edu

Web: <http://www.mnpi.umn.edu/psat.htm>

RESEARCH

Overall Project Outcome and Results

Nitrate leaching to groundwater and phosphorus runoff to surface water are major concerns in sandy ecoregions in Minnesota. Some of these concerns can be attributed to agricultural crop management. This project was comprised of research, demonstration, and outreach to address strategies that can be used to minimize or reduce nitrate leaching and phosphorus runoff in agricultural settings.

Research evaluating slowed nitrogen transformation products, nitrogen application timing, and nitrogen rates was conducted on potatoes, kidney beans, and corn under irrigation on sandy soils. For potatoes, variety response to nitrogen rate, source, and timing was also evaluated. Results showed several nitrogen management approaches reduced nitrate leaching while maintaining economic yields. Based on these results, promising treatments were demonstrated at a field scale using cost share monies. In some cases, producers tested or adopted new practices without the cost share incentive.

- For potatoes, results show that at equivalent nitrogen rates, use of slow release nitrogen reduced nitrate leaching on average by 20 lb nitrogen per acre. Economically optimum nitrogen rates could be reduced by an average of 15 lb nitrogen per acre with slow release nitrogen. In addition, a primary advantage of using slow release nitrogen was that only one application was required instead of multiple applications, which resulted in lower application costs. As a result of this research, slow release nitrogen is being used on ~15,000 acres in the state or about 1/3 of the potato acreage. The reduction in leaching to groundwater based on these results is 300,000 lbs of nitrogen in the state for potatoes alone.
- For corn the slow nitrogen release product applied at planting resulted in a 29 bu/acre increase over the one time application of untreated urea at planting and also allowed eliminating a split nitrogen application. Nitrate leaching was also significantly reduced.
- Similar results were found for kidney beans. It was also shown that the kidney bean nitrogen rate could be reduced by one third when the coated urea was used at planting. A number of best management practices for using polymer coated urea in irrigated potato, kidney bean, and corn production systems have been developed as result of this research.

The research and demonstration results were the basis for a number of educational programs for farmers and those that advise farmers to encourage implementation over a wide area with high risk soils and aquifers. In cooperation with the Minnesota Department of Agriculture, two surveys were also conducted in 12 counties with sandy soils and surficial aquifers to determine nitrate levels in private and municipal well water and the economics of treating water from them. The survey was targeted to sandy regions by combining a zip code map with a soil association map or with nitrate probability maps from the Minnesota Department of Health. In the private well water survey about 6% of the wells were found to be above the USEPA drinking water standard of 10 ppm nitrate-nitrogen. The survey highlighted the economics of nitrate leaching and some of the options that municipalities and private well owners have taken to deal with high nitrate in their drinking water. The Minnesota Phosphorus Source Assessment Tool (PSAT) was developed to allow evaluation of phosphorus sources in small watersheds for educational and planning purposes. The PSAT is currently being used by water planners such as Soil and Water Conservation Districts, Watershed Districts, and Lake Associations. Six peer reviewed publications and three fact sheets have been produced based on the research conducted in this project.

Project Results Use and Dissemination

Presentations were made to various organizations and at various conferences throughout the project period. This included presentations to the Northern Plains Potato Growers Association, Soil Science Society of America, American Society for Horticultural Science, Minnesota Ground Water Association, and others. Additionally, hundreds of growers and grower consultants were contacted about the project and its findings. Hands-on demonstrations of the Phosphorus Source Assessment Tool (PSAT) were conducted across the state, and it is now being used by soil and water conservation districts, watershed districts, lake associations, and others. The tool, back ground information, and user manual are available at <http://www.mnpi.umn.edu/psat.htm>. Finally, the project findings were presented in numerous peer-reviewed articles and through numerous fact sheets available on the web.

FINAL REPORT (Project Publications Attached)

Project completed: 06/30/2010

Improving Impaired Watersheds: Conservation Drainage Research

[Back to top of page](#)

Subd. 07j \$300,000

Mark Dittrich

Dept of Agriculture
625 Robert St. N.
St. Paul, MN 55155

Phone: (651) 201-6482

Email: mark.dittrich@state.mn.us

Fax: (651) 201-6120

RESEARCH

Overall Project Outcome and Result

Rural drainage systems are being repaired and replaced in Minnesota at an increasing rate. This provides a unique opportunity to simultaneously install conservation designs and practices with drainage repairs and improvements. This project measures the efficacy of three conservation practices with in-field methods and computer simulation of their performance in southern Minnesota. These innovative conservation practices may play a vital role in improving water quality in Minnesota and the hypoxic zone in the Gulf of Mexico.

Measuring the Efficacy of Three Conservation Practices:

1. **Managed Drainage:** Water control structures in drainage pipe designed to retain soil moisture by seasonally elevating the water table in the crop field within 2 feet from the soil surface.
2. **Shallow Drainage:** Drainage pipe installed at 2.5-3ft depth, rather than the traditional 4-5 ft depth.
3. **Woodchip Bioreactor:** Connecting drainage outlet pipe to an excavated area filled with woodchips, then area is capped with 12-18" of topsoil.

Results for Managed and Shallow Drainage: Field-based Studies

The field-based studies occurred in Nicollet and Mower County with fully instrumented flow measurement devices and weekly nitrate-nitrogen grab samples. There were two research plots, each approximately 10 acres for each site. Findings showed a 20% reduction in the flow discharge from managed drainage compared to conventional drainage. Nitrate concentrations between plots were very similar, and nitrate load reduction in managed drainage plots compared to conventional subsurface drainage practices were associated with the total amount of flow discharged, not the nitrate concentration.

Computer Simulation for Managed and Shallow Drainage

Computer modeling can help understand the range of impacts where field based studies may be cost prohibitive. Important site specific parameters for modeling subsurface drainage include soil and climate factors such as rainfall, temperature, and evapotranspiration. Together these dictate the range of potential effects a drainage system and the associated designs have upon the receiving water body. Also, simulations can associate the size and timing of the associated benefits with these two conservation management practices: managed and shallow drainage.

Three sites were chosen for simulation, as they provided needed baseline information for climate, soils and associated drainage management practices (managed and shallow drainage). The sites included were located in Redwood, Waseca and Mower counties, which provided a range of climate and soil parameters.

Results from Computer Simulation

- Redwood County site exhibited the greatest drainage volume reduction for shallow and managed drainage compared with conventional drainage: 18% and 38% respectively. The Mower County site exhibited the least volume reduction for shallow and managed drainage: 7% and 26% respectively.
- Managed drainage provided a 15% volume reduction beyond shallow drainage at each of the three site locations.

Woodchip Bioreactor: Rice and Dodge County Sites

The primary focus at these two sites was to measure the efficacy of a woodchip bioreactor, which is an excavated area intercepting subsurface drainage and retaining drainage water long enough to significantly reduce nutrient and bacteria concentrations. The two sites and infrastructure will be used for ongoing analysis of herbicide remediation in 2010-2011.

Results for Woodchip Bioreactor

- 50% of nitrate-nitrogen load was reduced within the woodchip trench in less than 32 hours, 30% of the load was reduced in 22 hours, and nearly 100% in 50 hours.
- Phosphorus concentrations were reduced by about 50%.

Project Results Use and Dissemination

The results from this study were disseminated through USDA and USEPA task force and coalition meetings that included industry in public-private partnerships with the research and field-based studies. Leadership and program development was provided primarily with the USDA - Natural Resources and Conservation Service (NRCS) and the USDA - Agricultural Research Service (ARS), beginning in 2003. Related activities included presentations to more than 32 groups, and delivering 2,200 publications to interested stakeholders and agency staff. These activities occurred in concert with Dr. Gary Sands's University of Minnesota "Drainage Outlet" website that has been redesigned to increase information delivery and overall ease-of-access. Full reports are located at www.mda.state.mn.us

FINAL REPORT

Project completed: 06/30/2009

Subd. 09 Agriculture and Natural Resource Industries

Completing Third-Party Certification of DNR Forest Lands

Subd. 09a \$250,000

[Back to top of page](#)

Rebecca Barnard

DNR-Forestry
500 Lafayette Rd
St. Paul, MN 55155

Phone: (651) 624-5256

Email: Rebecca.Barnard@state.mn.us

Fax: (651) 259-5954

Web: www.dnr.state.mn.us/forestry/certification/index.html.

Due to the complexity and general lack of awareness of Forest Certification among the general public, numerous "Fact Sheets", briefing documents, newsletter articles, and general informational publications have also been produced and distributed to internal staff and/or external stakeholders. In some cases, these are also available on DNR's website.

Since initially pursuing dual certification in 2005, Minnesota DNR's Forest Certification Coordinator and other members of the Forest Certification Implementation Team (FCIT) have attended and presented a great number of conferences, stakeholder meetings, workshops, field tours, training sessions, etc. Over the course of the last five years, it is likely that several thousands, if not more, people have been reached via the methods described above.

More recently, Minnesota DNR has been closely engaged in the FSC and SFI Standard revision process. Minnesota DNR, along with other partners, has submitted extensive comments on the SFI and FSC Standard revisions and has also participated in several conference calls, face-to-face meetings, and in a field test of the newly proposed FSC National Standard. Through these efforts, Minnesota DNR has reached many more people and stakeholder groups, either directly or indirectly.

Supplementary Materials (available on DNR's website or upon request):

- FSC and SFI Forest Management Certificates for 2005-2010 (website)
- FSC and SFI Assessment and Annual Audit Reports (website)
- Map of Certified Forestlands in Minnesota (website)
- DNR's Internal Audit Team Reports (upon request)
- Minnesota DNR CAR Response (upon request)
- Issue "Fact Sheets" (upon request)
- Presentations (upon request)
- General Publications, Newsletter Articles, etc. (various sources - upon request)

FINAL REPORT

Project completed: 06/30/2010

SUBD. 10 ENERGY

Clean Energy Resource Teams and Community Wind Energy Rebate and Financial Assistance Programs

[Back to top of page](#)

Subd. 10a \$700,000

Stacy Miller

Dept of Commerce - State Energy Office
85 - 7th Place E, Suite 500
St. Paul, MN 55101

Phone: (651) 282-5091

Email: stacy.miller@state.mn.us

Fax: (651) 297-7891

Web: <http://www.commerce.state.mn.us>

The project has been divided into two parts. Part 1 - Clean Energy Resources Teams for \$300,000 was completed in 2007. Part 2 - Community Wind Energy Rebate and Financial Assistance Program for \$400,000 which will be completed in 2010.

PART 1: Clean Energy Resource Teams

Appropriation Amount: \$300,000

Overall Project Outcome and Results:

The Clean Energy Resource Teams (CERTs) provide technical assistance to implement cost-effective conservation, energy efficiency, and renewable energy projects throughout Minnesota. This is accomplished through a network of six regional teams working with the statewide CERTs coordinators to implement community-based energy projects that addressed their respective regional priorities.

CERTs awarded grants for technical assistance for at least two projects in each region, funding fifteen in all. An estimated thirty energy efficiency and renewable energy projects received assistance from CERTs while countless individuals consulted with CERTs coordinators for project advice.

The CERTs model has proven to be an effective way for citizens to participate in energy efficiency and renewable energy development. In 2006, the Minnesota Environmental Initiative recognized the Clean Energy Resource Teams with the Partnership of the Year award. As further affirmation of the CERTs model, both the governor and the legislature budgeted for a second phase of CERTs through fiscal year 2009. (Minnesota State Laws 2007, 216C.385.) This legislation also appropriated funds to create a seventh CERT to serve the Twin Cities area. A survey titled, Report on the Clean Energy Resource Teams (CERTs) Project is part of the final report and measures volunteer satisfaction with the CERTs program statewide at 95%. (See Attachment D.)

Project Results Use and Dissemination:

Each CERT hosts a quarterly meeting that draws between 20 and 100 people. Additionally, there are frequent workshops and trainings. This year, the CERTs statewide conference drew 400 people from the public, private, and not-for-profit sectors.

Designing a Clean Energy Future: A Resource Manual was published in 2003 to highlight opportunities for communities to work together on energy issues. It offers basic information on energy efficiency, biofuels, solar, and wind as well as other renewable technologies with tips on how to implement projects. The manual is available in hard copy and at <http://www.cleanenergyresourceteams.org>.

The CERTs website had nearly 16,000 new visitors this year. Additionally, there are 1,100 e-mail subscribers to CERTs monthly updates which cover upcoming events, funding opportunities and regional project highlights.

The CERT model is receiving recognition nationwide. This fall, CERTs is presenting to the Will Steger Foundation Summer Institute, the Rural Youth Summit in Ames, Iowa and the Western Mountains Alliance in Maine. The presentations will focus on how partnerships between land grant universities, not-for-profit organizations, and state energy offices can be an effective way for citizens to get involved in implementing successful community-based energy projects.

FINAL REPORT

Project completed: 06/30/2007

PART 2: Community Wind Energy Rebate and Financial Assistance Program

Appropriation Amount: \$400,000

Overall Project Outcome and Results

The Community Wind Energy Rebate and Financial Assistance Program was designed to competitively select proposed community-owned wind energy projects to receive financial assistance and rebates of \$200,000 for the successful completion of megawatt-scale, grid-connected wind turbines. The goal behind the program was to demonstrate how a local government could use local resources to utilize renewable energy development as a means to direct funding to the public and to help contribute to local renewable energy goals. Two local government projects were competitively selected to participate in this program including Winona County Economic Development Authority (EDA) and a collaborative effort by the Rural Minnesota Energy Board (RMEB) and the Metropolitan Energy Policy Coalition (MEPC), formerly known as the Metro County Energy Task Force (MCETF). Both entities found that publicly owned megawatt-scale wind projects are difficult to develop without private partnerships that allow for federal financial support.

In the case of Winona County EDA, there were a number of hurdles and barriers encountered. During the 2007 legislative session, the county first had to pursue legislation (Minn Laws 2007 Ch. 57, art. 2, Sec. 39) to allow the county to sell power. Following that a number of financing options were considered before one was settled upon. Based on the selected option, Winona County EDA submitted their proposal for approval to receive the rebate in January 2010. However, at this time Winona County EDA's effort was determined to be ineligible for a rebate due to the project ownership structure necessary to allow eligibility for federal grants. Under the proposal, the Winona County EDA would have entered into a partnership with private investors to create a limited liability corporation. Winona County EDA proposed receiving the Environment and Natural Resources Trust Fund dollars and in turn, lending the funds to the project partners. However, this structure was deemed not to fit the requirements of the grant that the project be owned by a public entity. In a letter dated April 28, 2010, the Department of Commerce officially requested that the \$200,000 in funds reserved for Winona County EDA be returned to the Trust Fund.

While this program did not contribute financial assistance to a local government to support the development of a megawatt-scale local wind project, the grant opportunity was helpful in obtaining the legal authorization to own interest in a wind generation project and to do so on a timeline that will allow for the contribution of federal funds. The lessons learned through this exercise are included in the final report and may be valuable to other public entities seeking to participate in public-private partnerships.

RMEB is a Joint Powers of sixteen counties in southern Minnesota formed to provide policy guidance on issues surrounding energy development in rural Minnesota. MEPC is a member group of seven metro area counties and the Metropolitan Council with "longterm interest in the use of secure, safe, reliable, sustainable, economical and environmentally responsible energy for constituents." The RMEB-MEPC County Wind Initiative (CWI) was the result of discussions among RMEB and MEPC members with mutual interest to assist in developing local wind projects, especially in rural southwest counties, with the potential to provide rural and metro counties with clean renewable electricity and the opportunity to stabilize energy costs.

These initial discussions explored the technical and governmental framework necessary for constructing 5-20 MW of community-owned wind generation capacity. Due to the complexity of the development process, CWI requested that LCCMR allow funds to be directed to assist with the planning process rather than as a \$200,000 rebate. The request was approved

with the objective of developing a procurement approach by which other public institutions in similar situations could develop and benefit from community-owned wind energy projects. The lessons learned through this exercise may be valuable to other public entities seeking to develop large-scale renewable energy projects by utilizing public-private partnerships and other governance structures.

FINAL REPORT

Project completed: 6/30/2010

Wind to Hydrogen Demonstration

Subd. 10e \$800,000

[Back to top of page](#)

Mike Reese

U of M - W. Central Research & Outreach Ctr.
46352 State Hwy 329
Morris, MN 56267

Phone: (320) 589-1711

Email: reesem@morris.umn.edu

Fax: (320) 589-4870

Web: <http://renewables.morris.umn.edu/>

Overall Project Outcome and Results

The Wind to Hydrogen Demonstration project was funded by the Environment and Natural Resources Trust Fund in July 2005 with the goal of demonstrating the use of wind energy to store hydrogen for use as base load or peak power.

After a lengthy development process, in March 2010 the University granted final approvals necessary to proceed with construction of the facility. An electrolyzer capable of producing 1.2 lbs of hydrogen per hour was purchased from Proton Energy Systems and a 60 kilowatt engine generator was purchased from the Hydrogen Engine Center. The electrolyzer uses electricity to separate hydrogen and oxygen from water. The engine generator produces electrical energy by combusting hydrogen gas. The systems were installed at the West Central Research and Outreach Center in June 2010. Following installation, Proton Energy Systems and Hydrogen Engine Center commissioned the equipment and trained University staff. All commissioning steps were completed. The electrolyzer produced 3.5 cubic feet or 2.6 lbs of hydrogen. The hydrogen engine generator was brought up to full power generation.

The goal of the project to use wind energy to store hydrogen for use as base load or peak power has been successfully demonstrated. The University will continue to operate the pilot facility to determine the feasibility of using hydrogen to store wind energy and to create value-added products such as nitrogen fertilizer. Successful demonstration of the system can address main barriers for wind energy. Storage processes such as the production of hydrogen may be an opportunity to overcome the 'intermittency' barrier. The second barrier is the lack of transmission capacity. The production of hydrogen can impact this barrier by using excess wind energy to produce hydrogen and other value added components thereby diminishing the need for additional transmission to move power to load centers. Energy intense industries may then be created in rural areas with high wind resources. The benefits are three-fold: the grid is better managed, the environment benefits from increased use of renewable energy, and the state economy is enhanced.

Project Results Use and Dissemination:

The intent is for the results to lead to commercial wind to hydrogen production facilities. Initial funding for the Wind to Hydrogen Demonstration was provided by the Environment and Natural Resources Trust Fund. Additional funding from the State and the University for a second phase will be used to demonstrate using hydrogen to produce nitrogen fertilizer. It is anticipated that the combination of hydrogen storage for electrical energy generation and use for nitrogen fertilizer production could be a viable economic model in the near future. The information has been disseminated to a wide group of stakeholders and students through presentations, print materials, media articles, tours, and the web including seven national presentations, twenty-two regional presentations, and over fifty local presentations. Since its installation in June 2010, over 1,000 people have toured the facility. There have been several news articles primarily in agriculture magazines. The project has also been mentioned in hydrogen-related stories in the New York Times and the Washington Post. As a University of Minnesota Research and Outreach Center - inherent in the name and mission - information regarding the project will continue to be disseminated to a broad audience in multiple formats.

FINAL REPORT

Project completed: 06/30/2010

IV. Agency Implementation

*“recommendations to implement
successful projects and
programs into a state agency’s
standard operations;”*

No recommendations at this
time.

IX. Gifts and Donations

*“a list of all gifts and donations
with a value over \$1,000;”*

No gifts or donations were
received.

V. Recommendations

“to the extent known by the commission, descriptions of the projects anticipated to be supported by the trust fund during the next biennium;”

There is \$25,328,000 available for expenditure in each year of the FY2012-2013 biennium from the Environment and Natural Resources Trust Fund (Trust Fund). The LCCMR is making a biennial funding recommendation to the Legislature from the Trust Fund for FY2012-2013 totaling \$50,623,000.

In addition to recommendations from the Trust Fund, \$750,000 is recommended from Federal Land and Water Conservation Funds (LAWCON) M.S. in FY2012.

The LCCMR adopted the funding recommendations for FY2012-2013 on July 14, 2010 and the Legislative bill on November 18, 2010.

FY 2012-13 Environment and Natural Resources Trust Fund Recommendations

In Minnesota's next biennium (July 1, 2011 - June 30, 2013), approximately \$25.3 million is available each year (Total = \$50,656,000) for funding from the Environment and Natural Resources Trust Fund and a total of \$750,000 from the Land and Water Conservation Account (LAWCON). In response to the LCCMR's FY 2012-13 Request for Proposal, 241 proposals requesting a total of approximately \$163.8 were received. After full consideration of all proposals received, on July 14, 2010 the LCCMR selected 92 projects to be included in its appropriation recommendations to the 2011 Minnesota Legislature. These recommendations ranged from full funding for the full proposal and dollar amount requested to partial funding for specific proposal elements and partial dollar amounts requested.

Category	\$ Recommendation	Percentage of Total Recommendation
Subdivision 3. Natural Resource Data and Information (19 Appropriations [21 Projects])	\$10,960,000	21.33%
Subdivision 4. Land, Habitat, and Recreation (23 Appropriations [41 Projects])	\$29,885,000	58.17%
Subdivision 5. Water Resources (11 Appropriations [12 Projects])	\$3,352,000	6.52%
Subdivision 6. Aquatic and Terrestrial Invasive Species (4 Appropriations)	\$1,210,000	2.36%
Subdivision 7. Renewable Energy and Air Quality (6 Appropriations)	\$1,850,000	3.60%
Subdivision 8. Environmental Education (6 Appropriations)	\$2,714,000	5.28%
Subdivision 9. Administration and Contract Management (2 Appropriations)	\$1,402,000	2.73%
TOTAL \$ RECOMMENDATION	\$51,373,000	100.00%

Fund Source	
FY 2012 - Environment and Natural Resources Trust Fund	\$25,312,000
FY 2013 - Environment and Natural Resources Trust Fund	\$25,311,000
Land and Water Conservation Account (LAWCON)	\$750,000
TOTAL \$	\$51,373,000

FY 2012-13 Environment and Natural Resources Trust Fund Recommendations

* Region of Impact designated in the State include Statewide, Central, Metro, NE, NW, SE, SW. Metro region includes the 11 counties of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright.

Subd.	LCCMR ID	Title	Affiliation	Program Manager	Recommending	FY12 Trust Fund \$ (\$25,312,000)	FY13 Trust Fund \$ (\$25,311,000)	LAWCON (\$750,000)	Region of Impact
Subd. 3 Natural Resource Data and Information (19 Appropriations - 21 Projects / Subtotal = \$10,960,000)									
3a	001-A1	Minnesota County Biological Survey	DNR	Carmen Converse	\$2,250,000	\$1,125,000	\$1,125,000	\$0	Statewide
3b1	002-A1	County Geologic Atlases for Sustainable Water Management	U of MN - Minnesota Geological Survey	Dale Setterholm	\$1,200,000	\$600,000	\$600,000	\$0	Statewide
3b2	002-A1	County Geologic Atlases for Sustainable Water Management	DNR	Jan Falteisek	\$600,000	\$300,000	\$300,000	\$0	Statewide
3c	007-A1	The Completion of a Statewide Digital Soil Survey	Board of Water and Soil Resources	Megan Lennon	\$500,000	\$250,000	\$250,000	\$0	Statewide
3d	004-A1	Updating the National Wetland Inventory for Minnesota - Phase III	DNR	Steve Kloiber	\$1,500,000	\$0	\$1,500,000	\$0	NE, Central, SW, SE
3e1	008-A1	Minnesota Breeding Bird Atlas - Phase III	Audubon Minnesota	Mark Martell	\$228,000	\$0	\$228,000	\$0	Statewide
3e2	008-A1	Minnesota Breeding Bird Atlas - Phase III	NRRI - UMD	Gerald Niemi	\$102,000	\$0	\$102,000	\$0	Statewide
3f	013-A1	Golden Eagle Survey	National Eagle Center	Scott Mehus	\$90,000	\$45,000	\$45,000	\$0	SE
3g	009-A1	Determining Causes of Mortality in Moose Populations	DNR	Erika Butler	\$600,000	\$300,000	\$300,000	\$0	NE
3h	216-H	Canada Lynx Recovery Options	U of MN - NRRI	Ron Moen	\$50,000	\$25,000	\$25,000	\$0	NE
3i	063-C1+2	Conserving Prairie Plant Diversity and Evaluating Local Adaptation	U of MN	Ruth Shaw	\$525,000	\$262,000	\$263,000	\$0	NW, Central, SW
3j	064-C1+2	Prairie Management for Wildlife and Bioenergy - Phase II	U of MN	Clarence Lehman	\$950,000	\$475,000	\$475,000	\$0	Statewide
3k	146-F3+4	Evaluation of Biomass Harvesting Impacts on Minnesota's Forests	U of MN	Anthony D'Amato	\$350,000	\$175,000	\$175,000	\$0	NW, NE, Central
3l	135-F1+2+5	Change and Resilience in Boreal Forests in Northern Minnesota	U of MN	Lee Frelich	\$200,000	\$100,000	\$100,000	\$0	NE
3m	020-A2	Information System for Wildlife and Aquatic Management Areas	DNR	Steve Benson	\$500,000	\$250,000	\$250,000	\$0	Statewide
3n	015-A2	Strengthening Natural Resource Management with LiDAR Training	U of MN	Leslie Everett	\$180,000	\$90,000	\$90,000	\$0	Statewide
3o	089-C3+4	Measuring Conservation Practice Outcomes	Board of Water and Soil Resources	Megan Lennon	\$340,000	\$170,000	\$170,000	\$0	Statewide
3p	032-B	Conservation-Based Approach for Assessing Public Drainage Benefits	Board of Water and Soil Resources	Al Kean	\$150,000	\$75,000	\$75,000	\$0	NW, Central, SW
3q	079-C3+4	Mississippi River Central Minnesota Conservation Planning	Stearns County Soil and Water Conservation District	Dennis Fuchs	\$175,000	\$87,000	\$88,000	\$0	Central

FY 2012-13 Environment and Natural Resources Trust Fund Recommendations

* Region of Impact designated in the State include Statewide, Central, Metro, NE, NW, SE, SW. Metro region includes the 11 counties of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright.

Subd.	LCCMR ID	Title	Affiliation	Program Manager	Recommending	FY12 Trust Fund \$ (\$25,312,000)	FY13 Trust Fund \$ (\$25,311,000)	LAWCON (\$750,000)	Region of Impact
3r	082-C3+4	Saint Croix Basin Conservation Planning and Protection	St. Croix River Association	Deb Ryun	\$200,000	\$100,000	\$100,000	\$0	NE, Metro
3s	078-C3+4	Brainerd Lakes Community-Based Conservation and Recreation Planning	Crow Wing County	Chris Pence	\$270,000	\$135,000	\$135,000	\$0	Central
Subd. 3 Natural Resource Data and Information Subtotal =					\$10,960,000	\$4,564,000	\$6,396,000	\$0	
Subd. 4 Land, Habitat, and Recreation (23 Appropriations - 41 Projects / Subtotal = 29,885,000)									
4a	215-H	Lake Vermilion State Park Development	DNR	Courtland Nelson	\$3,000,000	\$2,421,000	\$579,000	\$0	NE
4b	105-D	State Parks and Trails Land Acquisition	DNR	Larry Peterson	\$3,000,000	\$1,500,000	\$1,500,000	\$0	Statewide
4c	103-D	Metropolitan Regional Park System Acquisition	Metropolitan Council	Arne Stefferud	\$2,250,000	\$1,125,000	\$1,125,000	\$0	Metro
4d	109-D	Regional Park, Trail, and Connections Acquisition and Development Grants	DNR	Ronald Potter	\$2,000,000	\$1,000,000	\$1,000,000	\$0	Statewide
4e	101-D	Scientific and Natural Area Acquisition and Restoration	DNR	Peggy Booth	\$3,280,000	\$1,640,000	\$1,640,000	\$0	Statewide
4f	112-D	LaSalle Lake Scientific and Natural Area Acquisition	The Trust for Public Land	Susan Schmidt	\$2,000,000	\$1,000,000	\$1,000,000	\$0	NW
4g	116-D	Minnesota River Valley Green Corridor Scientific and Natural Area Acquisition	Green Corridor Inc.	Brad Cobb	\$2,000,000	\$1,000,000	\$1,000,000	\$0	SW
4h	102-D	Native Prairie Stewardship and Native Prairie Bank Acquisition	DNR	Jason Garms	\$1,000,000	\$500,000	\$500,000	\$0	Statewide
4i	104-D	Metropolitan Conservation Corridors (MeCC) - Phase VI	7 partners (8 individual projects)		\$3,475,000	\$1,737,000	\$1,738,000	\$0	Metro
4i1.1+1.2	104-D-1.1+1.2	1.1 / 1.2 - MeCC 6 - Coordination, Mapping & Outreach (1.1) & Mapping and Database Work (1.2)	Minnesota Land Trust	Sarah Strommen	\$400,000	\$200,000	\$200,000		Metro
4i2.1	104-D-2.1	2.1 - MeCC 6 - Restore and Enhance Significant Watershed Habitat	Friends of the Mississippi River	Tom Lewanski	\$200,000	\$100,000	\$100,000		Metro
4i2.3	104-D-2.3	2.3 - MeCC 6 - Restoring Our Lands and Waters	Great River Greening	Wiley Buck	\$400,000	\$200,000	\$200,000		Metro
4i2.6+3.3	104-D-2.6+3.3	2.6 / 3.3 - MeCC 6 - Priority Expansion and Restoration MN Valley NW Refuge	MN Valley National Wildlife Refuge Trust, Inc.	Deborah Loon	\$600,000	\$300,000	\$300,000		Metro
4i2.7+3.7	104-D-2.7+3.7	2.7 / 3.7 - MeCC 6 - Dakota County Riparian and Lakeshore Protection	Dakota County	Alan Singer	\$1,035,000	\$517,000	\$518,000		Metro
4i3.1	104-D-3.1	3.1 - MeCC 6 - TPL's Critical Land Protection Program	The Trust for Public Land	Becca Nash	\$500,000	\$250,000	\$250,000		Metro
4i3.2	104-D-3.2	3.2 - MeCC 6 - Protect Significant Habitat by Acquiring Conservation Easements	Minnesota Land Trust	Sarah Strommen	\$400,000	\$200,000	\$200,000		Metro
4i3.5	104-D-3.5	3.5 - MeCC 6 - Aquatic Management Area Acquisition	DNR	Mike Halverson	\$300,000	\$150,000	\$150,000		Metro

FY 2012-13 Environment and Natural Resources Trust Fund Recommendations

* Region of Impact designated in the State include Statewide, Central, Metro, NE, NW, SE, SW. Metro region includes the 11 counties of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright.

Subd.	LCCMR ID	Title	Affiliation	Program Manager	Recommendation	FY12 Trust Fund \$ (\$25,312,000)	FY13 Trust Fund \$ (\$25,311,000)	LAWCON (\$750,000)	Region of Impact
4j	106-D	Habitat Conservation Partnership (HCP) - Phase VII	8 partners (12 individual projects)		\$3,475,000	\$1,737,000	\$1,738,000	\$0	Statewide
4j1a	106-D-1a	1a - HCP 7 - Coordination, Mapping & Data Management	Pheasants Forever, Inc.	Joe Pavelko	\$55,000	\$27,000	\$28,000		Statewide
4j2e	106-D-2e	2e - HCP 7 - Wild Rice/Waterfowl Habitat: Enhancement and Long-term Monitoring	Leech Lake Band of Ojibwe	Steve Mortensen	\$50,000	\$25,000	\$25,000		Statewide
4j2g	106-D-2g	2g - HCP 7 - Restoration & Management - Wildlife Management Areas	DNR	Suzann Willhite	\$30,000	\$15,000	\$15,000		Statewide
4j2h	106-D-2h	2h - HCP 7 - Restoration & Management - DNR Fisheries	DNR	Linda Erickson-Eastwood	\$200,000	\$100,000	\$100,000		Statewide
4j2o	106-D-2o	2o - HCP 7 - Prairie Pothole Restoration on Waterfowl Areas	Friends of the Detroit Lakes Wetland Management Division	Greg Hoch	\$75,000	\$38,000	\$37,000		Statewide
4j3a	106-D-3a	3a - HCP 7 - Shoreland Protection Program	Minnesota Land Trust	Sarah Strommen	\$450,000	\$225,000	\$225,000		Statewide
4j3c	106-D-3c	3c - HCP 7 - Shallow Lake Conservation Easements	Ducks Unlimited	Jon Schneider	\$500,000	\$250,000	\$250,000		Statewide
4j3d	106-D-3d	3d - HCP 7 - Wetlands Reserve Program	Ducks Unlimited	Jon Schneider	\$775,000	\$387,000	\$388,000		Statewide
4j4a	106-D-4a	4a - HCP 7 - WMA/WPA Acquisition beyond Boundaries	Pheasants Forever, Inc.	Joe Pavelko	\$430,000	\$215,000	\$215,000		Statewide
4j4c	106-D-4c	4c - HCP 7 - TPLs Critical Lands Protection Program	The Trust for Public Land	Robert McGillvray	\$490,000	\$245,000	\$245,000		Statewide
4j4h	106-D-4h	4h - HCP 7 - Priority Acquisition, MN Valley Wetland Management District	MN Valley National Wildlife Refuge Trust, Inc.	Deborah Loon	\$400,000	\$200,000	\$200,000		Statewide
4j4i	106-D-4i	4i - HCP 7 - Habitat Acquisition – DNR Professional Services	DNR	Mike Halverson	\$20,000	\$10,000	\$10,000		Statewide
4k	107-D	Natural and Scenic Area Acquisition Grants	DNR	Wayne Sames	\$1,000,000	\$500,000	\$500,000	\$0	Statewide
4l	081-C3+4	Acceleration of Minnesota Conservation Assistance	Board of Water and Soil Resources	Tabor Hoek	\$500,000	\$250,000	\$250,000	\$0	Statewide
4m	066-C1+2	Conservation Easement Stewardship and Enforcement Program - Phase II	DNR	Susan Damon	\$500,000	\$250,000	\$250,000	\$0	Statewide
4n	N/A	Gulf Oil Spill Impacts on Minnesota's Migratory Bird Species	DNR	Carrol Henderson	\$250,000	\$125,000	\$125,000	\$0	Statewide
4o	067-C1+2	Recovery of At-Risk Native Prairie Species	Martin County Soil and Water Conservation District	Rich Perrine	\$147,000	\$73,000	\$74,000	\$0	SW
4p	071-C1+2	Controlling Encroachment of Woody Vegetation in Grasslands	DNR	Kurt Haroldson	\$200,000	\$100,000	\$100,000	\$0	NW, Central, Metro, SW, SE

FY 2012-13 Environment and Natural Resources Trust Fund Recommendations

* Region of Impact designated in the State include Statewide, Central, Metro, NE, NW, SE, SW. Metro region includes the 11 counties of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright.

Subd.	LCCMR ID	Title	Affiliation	Program Manager	Recommending	FY12 Trust Fund \$ (\$25,312,000)	FY13 Trust Fund \$ (\$25,311,000)	LAWCON (\$750,000)	Region of Impact
4q	068-C1+2	Understanding Threats, Genetic Diversity, and Conservation Options for Wild Rice	U of MN	David D. Biesboer	\$195,000	\$97,000	\$98,000	\$0	Statewide
4r	065-C1+2	Southeast Minnesota Stream Restoration	Trout Unlimited, Inc.	Jeff Hastings	\$250,000	\$125,000	\$125,000	\$0	Metro, SE
4s	069-C1+2	Restoration Strategies for Ditched Peatland Scientific and Natural Areas	DNR	Michele Walker	\$200,000	\$100,000	\$100,000	\$0	NW
4t	080-C3+4	Northeast Minnesota White Cedar Plant Community Restoration	Board of Water and Soil Resources	Dale Krystosek	\$250,000	\$125,000	\$125,000	\$0	NE
4u	090-C3+4	Restoring North Shore Forest	Sugarloaf: The North Shore Stewardship Association	Molly Thompson	\$63,000	\$31,000	\$32,000	\$0	NE
4v	098-C3+4	Assessment of Tree Retention Forestry Harvest Guidelines	U of MN - NRRI	Gerald Niemi	\$100,000	\$50,000	\$50,000	\$0	NW, NE
4w	N/A	Land and Water Conservation Account (LAWCON) Federal Reimbursement	DNR	Ron Potter Stan Linnell	\$750,000	\$0	\$0	\$750,000	NW, NE
Subd. 4 Land, Habitat, and Recreation Subtotal =					\$29,885,000	\$15,486,000	\$13,649,000	\$750,000	
Subd. 5 Water Resources (11 Appropriations - 12 Projects / Subtotal = \$3,352,000)									
5a	031-B	Groundwater Sustainability Assessment in the I-94 Growth Corridor	Environmental Quality Board	Princesa VanBuren Hanson	\$450,000	\$225,000	\$225,000	\$0	Metro
5b	025-B	Lake Superior Water Quality Monitoring	U of MN	Steve Colman	\$500,000	\$250,000	\$250,000	\$0	NE
5c	137-F1+2+5	Assessment of Changes in Minnesota's Wilderness Lakes	Science Museum of Minnesota	Daniel Engstrom	\$300,000	\$150,000	\$150,000	\$0	NE
5d	087-C3+4	Itasca County Sensitive Lakeshore Identification	Itasca County Soil and Water Conservation District	Jim Gustafson	\$160,000	\$80,000	\$80,000	\$0	NE
5e1	029-B	Trout Stream Springshed Mapping in Southeast Minnesota - Phase III	DNR	Jeff Green	\$220,000	\$110,000	\$110,000	\$0	SE
5e2	029-B	Trout Stream Springshed Mapping in Southeast Minnesota - Phase III	U of MN	Calvin Alexander	\$280,000	\$140,000	\$140,000	\$0	SE
5f	028-B	Mississippi Water Quality Assessment	U of MN	Michael Sadowsky	\$557,000	\$278,000	\$279,000	\$0	Statewide
5g	037-B	Zumbro River Watershed Restoration Prioritization	Zumbro Watershed Partnership	Lisa Eadens	\$150,000	\$75,000	\$75,000	\$0	SE
5h	030-B	Assessment of Minnesota River Antibiotic Concentrations	University of St. Thomas	Kristine Wammer	\$190,000	\$95,000	\$95,000	\$0	Central, SE
5i	035-B	Determination of Phosphorus Reduction from Perpetual Easements	Board of Water and Soil Resources USGS	Eric Mohring Vicki Christensen	\$125,000	\$62,000	\$63,000	\$0	Central

FY 2012-13 Environment and Natural Resources Trust Fund Recommendations

* Region of Impact designated in the State include Statewide, Central, Metro, NE, NW, SE, SW. Metro region includes the 11 counties of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright.

Subd.	LCCMR ID	Title	Affiliation	Program Manager	Recommending	FY12 Trust Fund \$ (\$25,312,000)	FY13 Trust Fund \$ (\$25,311,000)	LAWCON (\$750,000)	Region of Impact
5j	038-B	Wastewater Phosphorous Filtration Using Recycled By-Products	U of MN - NRRI	Larry Zanko	\$170,000	\$85,000	\$85,000	\$0	Statewide
5k	191-G	Community-Based Reduction of Water Contaminants	Institute for Agriculture and Trade Policy	Kathleen Schuler	\$250,000	\$125,000	\$125,000	\$0	Statewide
Subd. 5 Water Resources Subtotal =					\$3,352,000	\$1,675,000	\$1,677,000	\$0	
Subd. 6 Aquatic and Terrestrial Invasive Species (4 Appropriations / Subtotal = \$1,210,000)									
6a	118-E	Improved Detection of Harmful Microbes in Ballast Water	U of MN	Randall Hicks	\$250,000	\$125,000	\$125,000	\$0	NE
6b	119-E	Emerald Ash Borer Biocontrol Research and Implementation	Department of Agriculture	Monika Chandler	\$500,000	\$250,000	\$250,000	\$0	Statewide
6c	124-E	Emerald Ash Borer Landscape Management Impacts	U of MN	Vera Krischik	\$340,000	\$170,000	\$170,000	\$0	Statewide
6d	123-E	Evaluation of Switchgrass as Biofuel Crop	Central Lakes College	Jim Eckberg Robert Schafer	\$120,000	\$60,000	\$60,000	\$0	Statewide
Subd. 6 Aquatic and Terrestrial Invasive Species Subtotal =					\$1,210,000	\$605,000	\$605,000	\$0	
Subd. 7 Renewable Energy and Air Quality (6 Appropriations / Subtotal = \$1,850,000)									
7a	134-F1+2+5	Peatland Carbon Sequestration	DNR	Mark Lindquist	\$400,000	\$200,000	\$200,000	\$0	NW, NE
7b	138-F1+2+5	Addressing Ozone Pollution in Minnesota	U of MN	Julian Marshall	\$250,000	\$125,000	\$125,000	\$0	Statewide
7c	157-F3+4	Optimizing Biogas' Role in Meeting Minnesota's Energy Goals	Great Plains Institute	Amanda Bilek	\$300,000	\$150,000	\$150,000	\$0	Statewide
7d	156-F3+4	Supporting Community-Driven Sustainable Bioenergy Projects	Dovetail Partners, Inc.	Kathryn Fernholz	\$150,000	\$75,000	\$75,000	\$0	NE
7e	153-F3+4	Low Environmental Impact Sustainable Neighborhoods	U of MN	John Carmody	\$250,000	\$125,000	\$125,000	\$0	Metro
7f	188-G	Conservation Corps Training and Low-Income Solar Home Heating Installation	Conservation Corps - Minnesota	Tim Johnson-Grass	\$500,000	\$250,000	\$250,000	\$0	Statewide
Subd. 7 Renewable Energy and Air Quality Subtotal =					\$1,850,000	\$925,000	\$925,000	\$0	
Subd. 8 Environmental Education (6 Appropriations / Subtotal = \$2,714,000)									
8a	177-G	Minnesota Schools Conserving Energy and Water	Minnesota Pollution Control Agency	William Sierks	\$825,000	\$412,000	\$413,000	\$0	Statewide
8b	186-G	Youth-Led Renewable Energy and Energy Conservation in West and Southwest Minnesota	Prairie Woods Environmental Learning Center	Anne Dybsetter	\$246,000	\$123,000	\$123,000	\$0	Central, SW
8c	179-G	Minnesota Junior Master Naturalist Program	U of MN	Robert Blair	\$365,000	\$182,000	\$183,000	\$0	Statewide

FY 2012-13 Environment and Natural Resources Trust Fund Recommendations

* Region of Impact designated in the State include Statewide, Central, Metro, NE, NW, SE, SW. Metro region includes the 11 counties of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright.

Subd.	LCCMR ID	Title	Affiliation	Program Manager	Recommending	FY12 Trust Fund \$ (\$25,312,000)	FY13 Trust Fund \$ (\$25,311,000)	LAWCON (\$750,000)	Region of Impact
8d	185-G	Experiential Environmental Education for Urban Youth	Hennepin County	Mary Karius	\$708,000	\$354,000	\$354,000	\$0	Metro
8e	189-G	Eagles Linking Students to Science and Nature	U of MN	Julia Ponder	\$170,000	\$85,000	\$85,000	\$0	Statewide
8f	198-G	Cross-Cultural Cooperation in Fish and Wildlife Conservation	DNR	Josee Cung	\$400,000	\$200,000	\$200,000	\$0	SE
Subd. 8 Environmental Education Subtotal =					\$2,714,000	\$1,356,000	\$1,358,000	\$0	
Subd. 9 Administration (2 Appropriations / Subtotal = \$1,402,000)									
9a	---	Legislative-Citizen Commission on Minnesota Resources (LCCMR)	LCCMR	Susan Thornton	\$1,182,000	\$591,000	\$591,000	\$0	Statewide
9b	---	Contract Administration	DNR	Wayne Sames	\$220,000	\$110,000	\$110,000	\$0	Statewide
Category G Total =					\$1,402,000	\$701,000	\$701,000	\$0	
Grand Total =					\$51,373,000	\$25,312,000	\$25,311,000	\$750,000	

1.1 A bill for an act
 1.2 relating to state government; appropriating money for environment and natural
 1.3 resources.

1.4 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

1.5 Section 1. MINNESOTA RESOURCES APPROPRIATIONS.

1.6 The sums shown in the columns marked "Appropriations" are appropriated to the
 1.7 agencies and for the purposes specified in this act. The appropriations are from the
 1.8 environment and natural resources trust fund, or another named fund, and are available for
 1.9 the fiscal years indicated for each purpose. The figures "2012" and "2013" used in this
 1.10 act mean that the appropriations listed under them are available for the fiscal year ending
 1.11 June 30, 2012, or June 30, 2013, respectively. "The first year" is fiscal year 2012. "The
 1.12 second year" is fiscal year 2013. "The biennium" is fiscal years 2012 and 2013. The
 1.13 appropriations in this act are onetime.

1.14		<u>APPROPRIATIONS</u>	
1.15		<u>Available for the Year</u>	
1.16		<u>Ending June 30</u>	
1.17		<u>2012</u>	<u>2013</u>

1.18 Sec. 2. MINNESOTA RESOURCES

1.19	<u>Subdivision 1. Total Appropriations</u>	<u>\$</u>	<u>26,062,000</u>	<u>\$</u>	<u>25,311,000</u>
------	--------------------------------------------	-----------	-------------------	-----------	-------------------

1.20	<u>Appropriations by Fund</u>	
1.21	<u>2012</u>	<u>2013</u>

2.1	<u>Environment and</u>		
2.2	<u>natural resources</u>		
2.3	<u>trust fund</u>	<u>25,312,000</u>	<u>25,311,000</u>
2.4	<u>State land and</u>		
2.5	<u>water conservation</u>		
2.6	<u>account (LAWCON)</u>	<u>750,000</u>	<u>-0-</u>

2.7 Appropriations are available for two
 2.8 years beginning July 1, 2011, unless
 2.9 otherwise stated in the appropriation. Any
 2.10 unencumbered balance remaining in the first
 2.11 year does not cancel and is available for the
 2.12 second year.

2.13 Subd. 2. Definitions

2.14 (a) "Trust fund" means the Minnesota
 2.15 environment and natural resources trust fund
 2.16 referred to in Minnesota Statutes, section
 2.17 116P.02, subdivision 6.

2.18 (b) "State land and water conservation
 2.19 account (LAWCON)" means the state land
 2.20 and water conservation account in the natural
 2.21 resources fund referred to in Minnesota
 2.22 Statutes, section 116P.14.

2.23 Subd. 3. Natural Resource Data and
 2.24 Information

	<u>4,564,000</u>	<u>6,396,000</u>
--	------------------	------------------

2.25 (a) Minnesota County Biological Survey
 2.26 \$1,125,000 the first year and \$1,125,000
 2.27 the second year are from the trust fund
 2.28 to the commissioner of natural resources
 2.29 for continuation of the Minnesota county
 2.30 biological survey to provide a foundation
 2.31 for conserving biological diversity by
 2.32 systematically collecting, interpreting,
 2.33 and delivering data on plant and animal
 2.34 distribution and ecology, native plant
 2.35 communities, and functional landscapes.

3.1 **(b) County Geologic Atlases for**
3.2 **Sustainable Water Management**
3.3 \$900,000 the first year and \$900,000 the
3.4 second year are from the trust fund to
3.5 accelerate the production of county geologic
3.6 atlases to provide information essential to
3.7 sustainable management of ground water
3.8 resources by defining aquifer boundaries
3.9 and the connection of aquifers to the land
3.10 surface and surface water resources. Of
3.11 this appropriation, \$600,000 each year is
3.12 to the Board of Regents of the University
3.13 of Minnesota for the Geologic Survey and
3.14 \$300,000 each year is to the commissioner
3.15 of natural resources. This appropriation
3.16 is available until June 30, 2015, by which
3.17 time the project must be completed and final
3.18 products delivered.

3.19 **(c) Completion of Statewide Digital Soil**
3.20 **Survey**
3.21 \$250,000 the first year and \$250,000 the
3.22 second year are from the trust fund to
3.23 the Board of Water and Soil Resources
3.24 to accelerate the completion of county
3.25 soil survey mapping and Web-based data
3.26 delivery. The soil surveys must be done on a
3.27 cost-share basis with local and federal funds.

3.28 **(d) Updating National Wetlands Inventory**
3.29 **for Minnesota - Phase III**
3.30 \$1,500,000 the second year is from the trust
3.31 fund to the commissioner of natural resources
3.32 to continue the update of wetland inventory
3.33 maps for Minnesota. This appropriation
3.34 is available until June 30, 2015, by which

4.1 time the project must be completed and final
4.2 products delivered.

4.3 **(e) Minnesota Breeding Bird Atlas - Phase**

4.4 **III**

4.5 \$330,000 the second year is from the
4.6 trust fund for the continuation of the
4.7 statewide survey of Minnesota breeding
4.8 bird distribution and to create related
4.9 publications, including a book and online
4.10 atlas with distribution maps and breeding
4.11 status. Of this appropriation, \$228,000 is to
4.12 the commissioner of natural resources for
4.13 an agreement with the National Audubon
4.14 Society and \$102,000 is to the Board of
4.15 Regents of the University of Minnesota for
4.16 the Natural Resources Research Institute.

4.17 The atlas must be available for downloading
4.18 on the Internet free of charge. This
4.19 appropriation is available until June 30,
4.20 2015, by which time the project must be
4.21 completed and final products delivered.

4.22 **(f) Golden Eagle Survey**

4.23 \$45,000 the first year and \$45,000 the
4.24 second year are from the trust fund to the
4.25 commissioner of natural resources for an
4.26 agreement with the National Eagle Center to
4.27 increase the understanding of golden eagles
4.28 in Minnesota through surveys and education.

4.29 This appropriation is available until June
4.30 30, 2014, by which time the project must be
4.31 completed and final products delivered.

4.32 **(g) Determining Causes of Mortality in**
4.33 **Moose Populations**

4.34 \$300,000 the first year and \$300,000 the
4.35 second year are from the trust fund to

5.1 the commissioner of natural resources to
5.2 determine specific causes of moose mortality
5.3 and population decline in Minnesota and
5.4 to develop specific management actions to
5.5 prevent further population decline. This
5.6 appropriation is available until June 30,
5.7 2014, by which time the project must be
5.8 completed and final products delivered.

5.9 **(h) Canada Lynx Recovery Options**

5.10 \$25,000 the first year and \$25,000 the second
5.11 year are from the trust fund to the Board of
5.12 Regents of the University of Minnesota for
5.13 the Natural Resources Research Institute to
5.14 assess Canada lynx recovery options.

5.15 **(i) Conserving Prairie Plant Diversity and**
5.16 **Evaluating Local Adaptation**

5.17 \$262,000 the first year and \$263,000 the
5.18 second year are from the trust fund to
5.19 the Board of Regents of the University
5.20 of Minnesota to research and develop a
5.21 scientific basis for identifying adapted seed
5.22 sources for restoring prairie ecosystems and
5.23 to conserve the genetic diversity of plants
5.24 of the Minnesota tallgrass prairie. This
5.25 appropriation is available until June 30,
5.26 2014, by which time the project must be
5.27 completed and final products delivered.

5.28 **(j) Prairie Management for Wildlife and**
5.29 **Bioenergy - Phase II**

5.30 \$475,000 the first year and \$475,000 the
5.31 second year are from the trust fund to the
5.32 Board of Regents of the University of
5.33 Minnesota to research and evaluate methods
5.34 of managing diverse working prairies for
5.35 wildlife and renewable bioenergy production.

6.1 This appropriation is available until June
6.2 30, 2014, by which time the project must be
6.3 completed and final products delivered.

6.4 **(k) Evaluation of Biomass Harvesting**
6.5 **Impacts on Minnesota's Forests**

6.6 \$175,000 the first year and \$175,000 the
6.7 second year are from the trust fund to the
6.8 Board of Regents of the University of
6.9 Minnesota to assess the impacts biomass
6.10 harvests for energy have on soil nutrients,
6.11 native forest vegetation, invasive species
6.12 spread, and long-term tree productivity within
6.13 Minnesota's forests. This appropriation is
6.14 available until June 30, 2014, by which time
6.15 the project must be completed and final
6.16 products delivered.

6.17 **(l) Change and Resilience in Boreal Forests**
6.18 **in Northern Minnesota**

6.19 \$100,000 the first year and \$100,000 the
6.20 second year are from the trust fund to the
6.21 Board of Regents of the University of
6.22 Minnesota to assess the potential response
6.23 of northern Minnesota's boreal forests to
6.24 observed and predicted changes in climate
6.25 conditions and develop related management
6.26 guidelines and adaptation strategies. This
6.27 appropriation is available until June 30,
6.28 2014, by which time the project must be
6.29 completed and final products delivered.

6.30 **(m) Information System for Wildlife and**
6.31 **Aquatic Management Areas**

6.32 \$250,000 the first year and \$250,000 the
6.33 second year are from the trust fund to the
6.34 commissioner of natural resources to develop
6.35 an information system to facilitate improved

7.1 management of wildlife and fish habitat and
7.2 facilities. This appropriation is available
7.3 until June 30, 2014, by which time the
7.4 project must be completed and final products
7.5 delivered.

7.6 **(n) Strengthening Natural Resource**
7.7 **Management with LiDAR Training**

7.8 \$90,000 the first year and \$90,000 the second
7.9 year are from the trust fund to the Board of
7.10 Regents of the University of Minnesota to
7.11 provide workshops and Web-based training
7.12 and information on the use of LiDAR
7.13 elevation data in planning for and managing
7.14 natural resources.

7.15 **(o) Measuring Conservation Practice**
7.16 **Outcomes**

7.17 \$170,000 the first year and \$170,000 the
7.18 second year are from the trust fund to
7.19 the Board of Water and Soil Resources
7.20 to improve measurement of impacts of
7.21 conservation practices through refinement
7.22 of existing and development of new
7.23 pollution estimators and by providing local
7.24 government training.

7.25 **(p) Conservation-Based Approach for**
7.26 **Assessing Public Drainage Benefits**

7.27 \$75,000 the first year and \$75,000 the second
7.28 year are from the trust fund to the Board
7.29 of Water and Soil Resources to develop an
7.30 alternative framework to assess drainage
7.31 benefits on public systems to enhance water
7.32 conservation. This appropriation is available
7.33 until June 30, 2014, by which time the
7.34 project must be completed and final products
7.35 delivered.

8.1 (q) Mississippi River Central Minnesota
8.2 Conservation Planning
8.3 \$87,000 the first year and \$88,000 the
8.4 second year are from the trust fund to the
8.5 commissioner of natural resources for an
8.6 agreement with Stearns County Soil and
8.7 Water Conservation District to develop
8.8 and adopt river protection strategies in
8.9 cooperation with local jurisdictions in
8.10 the communities of the 26 miles of the
8.11 Mississippi River between Benton and
8.12 Stearns Counties. This appropriation must
8.13 be matched by \$175,000 of nonstate cash or
8.14 qualifying in-kind funds.

8.15 (r) Saint Croix Basin Conservation
8.16 Planning and Protection
8.17 \$100,000 the first year and \$100,000 the
8.18 second year are from the trust fund to
8.19 the commissioner of natural resources for
8.20 an agreement with the St. Croix River
8.21 Association to develop an interagency plan
8.22 to identify and prioritize critical areas for
8.23 project implementation to improve watershed
8.24 health. This appropriation must be matched
8.25 by \$200,000 of nonstate cash or qualifying
8.26 in-kind funds. Up to \$10,000 may be retained
8.27 by the Department of Natural Resources at
8.28 the request of the St. Croix River Association
8.29 to provide technical and mapping assistance.
8.30 This appropriation is available until June
8.31 30, 2014, by which time the project must be
8.32 completed and final products delivered.

8.33 (s) Brainerd Lakes Community-Based
8.34 Conservation and Recreation Planning

9.1 \$135,000 the first year and \$135,000 the
 9.2 second year are from the trust fund to the
 9.3 commissioner of natural resources for an
 9.4 agreement with Crow Wing County to
 9.5 develop and implement community-based
 9.6 conservation and recreational planning to
 9.7 protect natural resources. This appropriation
 9.8 is contingent on the commitment of
 9.9 Crow Wing County to pursue adoption of
 9.10 ordinances developed to protect the natural
 9.11 resources and provide a \$270,000 nonstate
 9.12 match of cash or qualifying in-kind funds.

9.13 Subd. 4. Land, Habitat, and Recreation 16,236,000 13,649,000

9.14 Summary by Fund

9.15 <u>Environment and</u>		
9.16 <u>natural resources</u>		
9.17 <u>trust fund</u>	<u>15,486,000</u>	<u>13,649,000</u>
9.18 <u>State land and</u>		
9.19 <u>water conservation</u>		
9.20 <u>account (LAWCON)</u>	<u>750,000</u>	<u>-0-</u>

9.21 (a) Lake Vermilion State Park

9.22 Development

9.23 \$2,421,000 the first year and \$579,000 the
 9.24 second year are from the trust fund to the
 9.25 commissioner of natural resources for initial
 9.26 phases of development of Lake Vermilion
 9.27 State Park. A master plan must be completed
 9.28 and a specific list of proposed projects
 9.29 and project elements must be provided to
 9.30 the Legislative-Citizen Commission on
 9.31 Minnesota Resources before any expenditure
 9.32 of money appropriated in this paragraph.

9.33 (b) State Parks and Trails Land

9.34 Acquisition

9.35 \$1,500,000 the first year and \$1,500,000 the
 9.36 second year are from the trust fund to the

10.1 commissioner of natural resources to acquire
10.2 state trails and critical parcels within the
10.3 statutory boundaries of state parks. State
10.4 park land acquired with this appropriation
10.5 must be sufficiently improved to meet at
10.6 least minimum management standards, as
10.7 determined by the commissioner of natural
10.8 resources. A list of proposed acquisitions
10.9 must be provided as part of the required work
10.10 program. This appropriation is available
10.11 until June 30, 2014, by which time the
10.12 project must be completed and final products
10.13 delivered.

10.14 **(c) Metropolitan Regional Park System**

10.15 **Acquisition**

10.16 \$1,125,000 the first year and \$1,125,000
10.17 the second year are from the trust fund to
10.18 the Metropolitan Council for grants for the
10.19 acquisition of lands within the approved park
10.20 unit boundaries of the metropolitan regional
10.21 park system. This appropriation may not
10.22 be used for the purchase of residential
10.23 structures. A list of proposed fee title and
10.24 easement acquisitions must be provided as
10.25 part of the required work program. This
10.26 appropriation must be matched by at least
10.27 40 percent of nonstate money and must be
10.28 committed by December 31, 2011, or the
10.29 appropriation cancels. This appropriation
10.30 is available until June 30, 2014, at which
10.31 time the project must be completed and final
10.32 products delivered, unless an earlier date is
10.33 specified in the work program.

10.34 **(d) Regional Park, Trail, and Connection**

10.35 **Acquisition and Development Grants**

11.1 \$1,000,000 the first year and \$1,000,000 the
 11.2 second year are from the trust fund to the
 11.3 commissioner of natural resources to provide
 11.4 matching grants to local units of government
 11.5 for acquisition and development of regional
 11.6 parks, regional trails, and trail connections.

11.7 The local match required for a grant to
 11.8 acquire a regional park or regional outdoor
 11.9 recreation area is two dollars of nonstate
 11.10 money for each three dollars of state money.

11.11 This appropriation is available until June
 11.12 30, 2014, by which time the project must be
 11.13 completed and final products delivered.

11.14 **(e) Scientific and Natural Area Acquisition**
 11.15 **and Restoration**

11.16 \$1,640,000 the first year and \$1,640,000
 11.17 the second year are from the trust fund
 11.18 to the commissioner of natural resources
 11.19 to acquire lands with high-quality native
 11.20 plant communities and rare features to be
 11.21 established as scientific and natural areas
 11.22 as provided in Minnesota Statutes, section
 11.23 86A.05, subdivision 5, restore parts of
 11.24 scientific and natural areas, and provide
 11.25 technical assistance and outreach. A list
 11.26 of proposed acquisitions must be provided
 11.27 as part of the required work program.

11.28 Land acquired with this appropriation
 11.29 must be sufficiently improved to meet at
 11.30 least minimum management standards, as
 11.31 determined by the commissioner of natural
 11.32 resources. This appropriation is available
 11.33 until June 30, 2014, by which time the
 11.34 project must be completed and final products
 11.35 delivered.

- 12.1 (f) LaSalle Lake Scientific and Natural
12.2 Area Acquisition
12.3 \$1,000,000 the first year and \$1,000,000 the
12.4 second year are from the trust fund to the
12.5 commissioner of natural resources for an
12.6 agreement with The Trust for Public Land
12.7 to acquire approximately 190 acres to be
12.8 designated as a scientific and natural area
12.9 as provided in Minnesota Statutes, section
12.10 86A.05, subdivision 5, on LaSalle Lake
12.11 adjacent to the upper Mississippi River. If
12.12 this acquisition is not completed by July 15,
12.13 2012, then the appropriation is available to
12.14 the Department of Natural Resources for
12.15 other scientific and natural area acquisitions
12.16 on the priority list. Up to \$10,000 may
12.17 be retained by the Department of Natural
12.18 Resources at the request of The Trust for
12.19 Public Land for transaction costs, associated
12.20 professional services, and restoration needs.
- 12.21 (g) Minnesota River Valley Green
12.22 Corridor Scientific and Natural Area
12.23 Acquisition
12.24 \$1,000,000 the first year and \$1,000,000
12.25 the second year are from the trust fund
12.26 to the commissioner of natural resources
12.27 for an agreement with the Redwood Area
12.28 Communities Foundation to acquire lands
12.29 with high-quality native plant communities
12.30 and rare features to be established as scientific
12.31 and natural areas as provided in Minnesota
12.32 Statutes, section 86A.05, subdivision 5. A list
12.33 of proposed acquisitions must be provided
12.34 as part of the required work program.
12.35 Land acquired with this appropriation

13.1 must be sufficiently improved to meet at
 13.2 least minimum management standards, as
 13.3 determined by the commissioner of natural
 13.4 resources. Up to \$54,000 may be retained by
 13.5 the Department of Natural Resources at the
 13.6 request of the Redwood Area Communities
 13.7 Foundation for transaction costs, associated
 13.8 professional services, and restoration needs.
 13.9 This appropriation is available until June
 13.10 30, 2014, by which time the project must be
 13.11 completed and final products delivered.

13.12 **(h) Native Prairie Stewardship and Native**
 13.13 **Prairie Bank Acquisition**

13.14 \$500,000 the first year and \$500,000 the
 13.15 second year are from the trust fund to the
 13.16 commissioner of natural resources to acquire
 13.17 native prairie bank easements, prepare
 13.18 baseline property assessments, restore and
 13.19 enhance native prairie sites, and provide
 13.20 technical assistance to landowners. This
 13.21 appropriation is available until June 30,
 13.22 2014, by which time the project must be
 13.23 completed and final products delivered.

13.24 **(i) Metropolitan Conservation Corridors**
 13.25 **(MeCC) - Phase VI**

13.26 \$1,737,000 the first year and \$1,738,000
 13.27 the second year are from the trust fund
 13.28 to the commissioner of natural resources
 13.29 for the acceleration of agency programs
 13.30 and cooperative agreements. Of this
 13.31 appropriation, \$150,000 the first year
 13.32 and \$150,000 the second year are to the
 13.33 commissioner of natural resources for
 13.34 agency programs and \$3,175,000 is for the
 13.35 agreements as follows: \$100,000 the first

14.1 year and \$100,000 the second year with
14.2 Friends of the Mississippi River; \$517,000
14.3 the first year and \$518,000 the second year
14.4 with Dakota County; \$300,000 the first year
14.5 and \$300,000 the second year with Great
14.6 River Greening; \$220,000 the first year and
14.7 \$220,000 the second year with Minnesota
14.8 Land Trust; \$200,000 the first year and
14.9 \$200,000 the second year with Minnesota
14.10 Valley National Wildlife Refuge Trust, Inc.;
14.11 and \$250,000 the first year and \$250,000
14.12 the second year with The Trust for Public
14.13 Land for planning, restoring, and protecting
14.14 priority natural areas in the metropolitan area,
14.15 as defined under Minnesota Statutes, section
14.16 473.121, subdivision 2, and portions of the
14.17 surrounding counties, through contracted
14.18 services, technical assistance, conservation
14.19 easements, and fee title acquisition. Land
14.20 acquired with this appropriation must
14.21 be sufficiently improved to meet at least
14.22 minimum management standards, as
14.23 determined by the commissioner of natural
14.24 resources. Expenditures are limited to the
14.25 identified project corridor areas as defined
14.26 in the work program. This appropriation
14.27 may not be used for the purchase of
14.28 habitable residential structures, unless
14.29 expressly approved in the work program. All
14.30 conservation easements must be perpetual
14.31 and have a natural resource management
14.32 plan. Any land acquired in fee title by the
14.33 commissioner of natural resources with
14.34 money from this appropriation must be
14.35 designated as an outdoor recreation unit
14.36 under Minnesota Statutes, section 86A.07.

15.1 The commissioner may similarly designate
15.2 any lands acquired in less than fee title. A
15.3 list of proposed restorations and fee title
15.4 and easement acquisitions must be provided
15.5 as part of the required work program. An
15.6 entity that acquires a conservation easement
15.7 with appropriations from the trust fund
15.8 must have a long-term stewardship plan
15.9 for the easement and a fund established for
15.10 monitoring and enforcing the agreement.
15.11 Money appropriated from the trust fund for
15.12 easement acquisition may be used to establish
15.13 a monitoring, management, and enforcement
15.14 fund as approved in the work program. An
15.15 annual financial report is required for any
15.16 monitoring, management, and enforcement
15.17 fund established, including expenditures
15.18 from the fund. This appropriation is available
15.19 until June 30, 2014, by which time the
15.20 project must be completed and final products
15.21 delivered.

15.22 **(j) Habitat Conservation Partnership**
15.23 **(HCP) - Phase VII**
15.24 \$1,737,000 the first year and \$1,738,000
15.25 the second year are from the trust fund
15.26 to the commissioner of natural resources
15.27 for the acceleration of agency programs
15.28 and cooperative agreements. Of this
15.29 appropriation, \$125,000 the first year
15.30 and \$125,000 the second year are to the
15.31 commissioner of natural resources for
15.32 agency programs and \$3,225,000 is for
15.33 agreements as follows: \$637,000 the first
15.34 year and \$638,000 the second year with
15.35 Ducks Unlimited, Inc.; \$38,000 the first year
15.36 and \$37,000 the second year with Friends

16.1 of Detroit Lakes Wetland Management
16.2 District; \$25,000 the first year and \$25,000
16.3 the second year with Leech Lake Band of
16.4 Ojibwe; \$225,000 the first year and \$225,000
16.5 the second year with Minnesota Land Trust;
16.6 \$200,000 the first year and \$200,000 the
16.7 second year with Minnesota Valley National
16.8 Wildlife Refuge Trust, Inc.; \$242,000 the
16.9 first year and \$243,000 the second year
16.10 with Pheasants Forever, Inc.; and \$245,000
16.11 the first year and \$245,000 the second year
16.12 with The Trust for Public Land to plan,
16.13 restore, and acquire fragmented landscape
16.14 corridors that connect areas of quality habitat
16.15 to sustain fish, wildlife, and plants. The
16.16 United States Department of Agriculture,
16.17 Natural Resources Conservation Service,
16.18 is an authorized cooperating partner in the
16.19 appropriation. Expenditures are limited to
16.20 the project corridor areas as defined in the
16.21 work program. Land acquired with this
16.22 appropriation must be sufficiently improved
16.23 to meet at least minimum habitat and facility
16.24 management standards, as determined by
16.25 the commissioner of natural resources.
16.26 This appropriation may not be used for the
16.27 purchase of habitable residential structures,
16.28 unless expressly approved in the work
16.29 program. All conservation easements must
16.30 be perpetual and have a natural resource
16.31 management plan. Any land acquired in fee
16.32 title by the commissioner of natural resources
16.33 with money from this appropriation must
16.34 be designated as an outdoor recreation unit
16.35 under Minnesota Statutes, section 86A.07.
16.36 The commissioner may similarly designate

17.1 any lands acquired in less than fee title. A
17.2 list of proposed restorations and fee title
17.3 and easement acquisitions must be provided
17.4 as part of the required work program. An
17.5 entity who acquires a conservation easement
17.6 with appropriations from the trust fund
17.7 must have a long-term stewardship plan
17.8 for the easement and a fund established for
17.9 monitoring and enforcing the agreement.
17.10 Money appropriated from the trust fund for
17.11 easement acquisition may be used to establish
17.12 a monitoring, management, and enforcement
17.13 fund as approved in the work program. An
17.14 annual financial report is required for any
17.15 monitoring, management, and enforcement
17.16 fund established, including expenditures
17.17 from the fund. This appropriation is available
17.18 until June 30, 2014, by which time the
17.19 project must be completed and final products
17.20 delivered.

17.21 **(k) Natural and Scenic Area Acquisition**
17.22 **Grants**
17.23 \$500,000 the first year and \$500,000 the
17.24 second year are from the trust fund to the
17.25 commissioner of natural resources to provide
17.26 matching grants to local governments for
17.27 acquisition of natural and scenic areas, as
17.28 provided in Minnesota Statutes, section
17.29 85.019, subdivision 4a. This appropriation
17.30 is available until June 30, 2014, by which
17.31 time the project must be completed and final
17.32 products delivered.

17.33 **(l) Acceleration of Minnesota Conservation**
17.34 **Assistance**

18.1 \$250,000 the first year and \$250,000 the
18.2 second year are from the trust fund to the
18.3 Board of Water and Soil Resources to provide
18.4 grants to soil and water conservation districts
18.5 to provide technical assistance to secure
18.6 enrollment and retention of private lands in
18.7 federal and state programs for conservation.

18.8 **(m) Conservation Easement Stewardship**
18.9 **and Enforcement Program - Phase II**

18.10 \$250,000 the first year and \$250,000 the
18.11 second year are from the trust fund to
18.12 the commissioner of natural resources to
18.13 accelerate the implementation of the Phase
18.14 I Conservation Easement Stewardship Plan
18.15 being developed with an appropriation
18.16 from Laws 2008, chapter 367, section 2,
18.17 subdivision 5, paragraph (h).

18.18 **(n) Gulf Oil Spill Impacts on Minnesota's**
18.19 **Migratory Bird Species**

18.20 \$125,000 the first year and \$125,000
18.21 the second year are from the trust fund
18.22 to commissioner of natural resources in
18.23 cooperation with and for agreements with
18.24 the United States Geological Survey, the
18.25 University of Minnesota, and North Dakota
18.26 State University to assess the impact of the
18.27 Gulf oil spill on migratory populations of
18.28 common loons and American white pelicans
18.29 in Minnesota and share the information
18.30 with the public and for other related efforts.
18.31 Expenses for management of contracted
18.32 services incurred for this appropriation shall
18.33 be paid from subdivision 9, paragraph (b).
18.34 This appropriation is available until June

19.1 30, 2014, by which time the project must be
19.2 completed and final products delivered.

19.3 **(o) Recovery of At-Risk Native Prairie**
19.4 **Species**

19.5 \$73,000 the first year and \$74,000 the second
19.6 year are from the trust fund to the Board of
19.7 Water and Soil Resources for an agreement
19.8 with the Martin County Soil and Water
19.9 Conservation District to collect, propagate,
19.10 and plant declining, at-risk native species
19.11 on protected habitat and to enhance private
19.12 market sources for local ecotype native seed.

19.13 This appropriation is available until June
19.14 30, 2014, by which time the project must be
19.15 completed and final products delivered.

19.16 **(p) Controlling Encroachment of Woody**
19.17 **Vegetation in Grasslands**

19.18 \$100,000 the first year and \$100,000 the
19.19 second year are from the trust fund to
19.20 the commissioner of natural resources to
19.21 evaluate treatments and identify the most
19.22 effective methods for controlling woody
19.23 vegetation in prairies and grasslands. This
19.24 appropriation is available until June 30,
19.25 2014, by which time the project must be
19.26 completed and final products delivered.

19.27 **(q) Understanding Threats, Genetic**
19.28 **Diversity, and Conservation Options for**
19.29 **Wild Rice**

19.30 \$97,000 the first year and \$98,000 the second
19.31 year are from the trust fund to the Board
19.32 of Regents of the University of Minnesota
19.33 to research the genetic diversity of wild
19.34 rice population throughout Minnesota for
19.35 use in related conservation and restoration

20.1 efforts. This appropriation is contingent upon
20.2 demonstration of review and cooperation
20.3 with the Native American tribal nations
20.4 in Minnesota. Equipment purchased with
20.5 this appropriation must be available for
20.6 future publicly funded projects at no charge
20.7 except for typical operating expenses. This
20.8 appropriation is available until June 30,
20.9 2014, by which time the project must be
20.10 completed and final products delivered.

20.11 **(r) Southeast Minnesota Stream**

20.12 **Restoration**

20.13 \$125,000 the first year and \$125,000 the
20.14 second year are from the trust fund to the
20.15 commissioner of natural resources for an
20.16 agreement with Trout Unlimited to restore at
20.17 least four miles of riparian corridor for trout
20.18 and nongame species in southeast Minnesota
20.19 and increase local capacities to implement
20.20 stream restoration through training and
20.21 technical assistance. This appropriation is
20.22 available until June 30, 2014, by which time
20.23 the project must be completed and final
20.24 products delivered.

20.25 **(s) Restoration Strategies for Ditched**

20.26 **Peatland Scientific and Natural Areas**

20.27 \$100,000 the first year and \$100,000 the
20.28 second year are from the trust fund to the
20.29 commissioner of natural resources to evaluate
20.30 the hydrology and habitat of the Winter Road
20.31 Lake peatland watershed protection area to
20.32 determine the effects of ditch abandonment
20.33 and examine the potential for restoration
20.34 of patterned peatlands. This appropriation
20.35 is available until June 30, 2014, by which

21.1 time the project must be completed and final
21.2 products delivered.

21.3 **(t) Northeast Minnesota White Cedar**

21.4 **Plant Community Restoration**

21.5 \$125,000 for the first year and \$125,000
21.6 the second year are from the trust fund to
21.7 the Board of Water and Soil Resources to
21.8 assess the decline of northern white cedar
21.9 plant communities in northeast Minnesota,
21.10 prioritize cedar sites for restoration, and
21.11 provide cedar restoration training to local
21.12 units of government.

21.13 **(u) Restoring North Shore Forests**

21.14 \$31,000 the first year and \$32,000 the
21.15 second year are from the trust fund to
21.16 the commissioner of natural resources for
21.17 an agreement with Sugarloaf: The North
21.18 Shore Stewardship Association to provide
21.19 forest stewardship plans, training, and tree
21.20 planting assistance for Lake Superior coastal
21.21 landowners with property sizes less than 20
21.22 acres who are not eligible for other state
21.23 stewardship programs. This appropriation
21.24 is available until June 30, 2014, by which
21.25 time the project must be completed and final
21.26 products delivered.

21.27 **(v) Assessment of Tree Retention Forestry**
21.28 **Harvest Guidelines**

21.29 \$50,000 the first year and \$50,000 the second
21.30 year are from the trust fund to the Board
21.31 of Regents of the University of Minnesota
21.32 for the Natural Resources Research Institute
21.33 to evaluate the effect of Minnesota's forest
21.34 management guidelines for tree retention
21.35 on wildlife populations. This appropriation

22.1 is available until June 30, 2014, by which
 22.2 time the project must be completed and final
 22.3 products delivered.

22.4 **(w) Land and Water Conservation Account**

22.5 **(LAWCON) Federal Reimbursement**

22.6 \$750,000 is from the state land and water
 22.7 conservation account (LAWCON) in the
 22.8 natural resources fund to the commissioner of
 22.9 natural resources for priorities established by
 22.10 the commissioner for eligible state projects
 22.11 and administrative and planning activities
 22.12 consistent with Minnesota Statutes, section
 22.13 116P.14, and the federal Land and Water
 22.14 Conservation Fund Act. This appropriation
 22.15 is available until June 30, 2014, by which
 22.16 time the project must be completed and final
 22.17 products delivered.

22.18 <u>Subd. 5. Water Resources</u>	<u>1,675,000</u>	<u>1,677,000</u>
----------------------------------------------	------------------	------------------

22.19 **(a) Groundwater Sustainability**

22.20 **Assessment in I-94 Growth Corridor**

22.21 \$225,000 the first year and \$225,000 the
 22.22 second year are from the trust fund to the
 22.23 commissioner of administration for the
 22.24 Environmental Quality Board to assess
 22.25 groundwater sustainability in the I-94 growth
 22.26 corridor between the Twin Cities and Saint
 22.27 Cloud and engage local communities in
 22.28 understanding groundwater and how it is
 22.29 impacted by land and water usage. This
 22.30 appropriation is available until June 30,
 22.31 2014, by which time the project must be
 22.32 completed and final products delivered.

22.33 **(b) Lake Superior Water Quality**

22.34 **Monitoring**

23.1 \$250,000 the first year and \$250,000 the
23.2 second year are from the trust fund to the
23.3 Board of Regents of the University of
23.4 Minnesota for the Large Lakes Observatory
23.5 for research of Lake Superior waters to
23.6 assess ecosystem health and water quality
23.7 in response to environmental stresses. This
23.8 appropriation is available until June 30,
23.9 2014, by which time the project must be
23.10 completed and final products delivered.

23.11 **(c) Assessment of Changes in Minnesota's**
23.12 **Wilderness Lakes**

23.13 \$150,000 the first year and \$150,000 the
23.14 second year are from the trust fund to the
23.15 Science Museum of Minnesota, St. Croix
23.16 Watershed Research Station, to assess
23.17 recent ecological changes to remote lakes
23.18 and determine which types of remote
23.19 lakes are most at risk from observed and
23.20 predicted changes in climate conditions.
23.21 This appropriation is available until June
23.22 30, 2014, by which time the project must be
23.23 completed and final products delivered.

23.24 **(d) Itasca County Sensitive Lakeshore**
23.25 **Identification**

23.26 \$80,000 the first year and \$80,000 the
23.27 second year are from the trust fund to the
23.28 commissioner of natural resources for an
23.29 agreement with Itasca County Soil and Water
23.30 Conservation District to identify sensitive
23.31 lakeshore and restorable shoreline in Itasca
23.32 County. Up to \$130,000 may be retained by
23.33 the Department of Natural Resources at the
23.34 request of Itasca County to provide technical
23.35 assistance.

24.1 (e) Trout Stream Springshed Mapping in

24.2 Southeast Minnesota - Phase III

24.3 \$250,000 the first year and \$250,000 the
24.4 second year are from the trust fund to
24.5 continue to identify and delineate water
24.6 supply areas and springsheds for springs
24.7 servng as cold water sources for trout
24.8 streams and to assess the impacts from
24.9 development and water appropriations. Of
24.10 this appropriation, \$140,000 each year is to
24.11 the Board of Regents of the University of
24.12 Minnesota and \$110,000 each year is to the
24.13 commissioner of natural resources.

24.14 (f) Mississippi River Water Quality

24.15 Assessment

24.16 \$278,000 the first year and \$279,000 the
24.17 second year are from the trust fund to the
24.18 Board of Regents of the University of
24.19 Minnesota to assess water quality in the
24.20 Mississippi River using DNA sequencing
24.21 approaches and chemical analyses. The
24.22 assessments shall be incorporated into
24.23 a Web-based educational tool for use
24.24 in classrooms and public exhibits. This
24.25 appropriation is available until June 30,
24.26 2014, by which time the project must be
24.27 completed and final products delivered.

24.28 (g) Zumbro River Watershed Restoration

24.29 Prioritization

24.30 \$75,000 the first year and \$75,000 the
24.31 second year are from the trust fund to the
24.32 commissioner of natural resources for an
24.33 agreement with the Zumbro Watershed
24.34 Partnership, Inc. to identify sources of
24.35 erosion and runoff in the Zumbro River

- 25.1 Watershed in order to prioritize restoration
25.2 and protection projects.
- 25.3 **(h) Assessment of Minnesota River**
25.4 **Antibiotic Concentrations**
- 25.5 \$95,000 the first year and \$95,000 the
25.6 second year are from the trust fund to the
25.7 commissioner of natural resources for an
25.8 agreement with Saint Thomas University
25.9 in cooperation with Gustavus Adolphus
25.10 College and the University of Minnesota
25.11 to measure antibiotic concentrations and
25.12 antibiotic resistance levels at sites on the
25.13 Minnesota River.
- 25.14 **(i) Determination of Phosphorus**
25.15 **Reduction from Perpetual Easements**
- 25.16 \$62,000 the first year and \$63,000 the second
25.17 year are from the trust fund to the Board of
25.18 Water and Soil Resources in cooperation
25.19 with the United States Geologic Survey
25.20 to evaluate the effectiveness of perpetual
25.21 easements in reducing phosphorus transport
25.22 into streams.
- 25.23 **(j) Wastewater Phosphorus Filtration**
25.24 **Using Recycled By-Products**
- 25.25 \$85,000 the first year and \$85,000 the second
25.26 year are from the trust fund to the Board of
25.27 Regents of the University of Minnesota for
25.28 the Natural Resources Research Institute to
25.29 evaluate the use of recycled iron by-products
25.30 and waste products for wastewater filtration
25.31 to remove phosphorus from surface water.
- 25.32 **(k) Community-Based Reduction of Water**
25.33 **Contaminants**

26.1 \$125,000 the first year and \$125,000 the
 26.2 second year are from the trust fund to the
 26.3 commissioner of natural resources for an
 26.4 agreement with the Institute for Agriculture
 26.5 and Trade Policy to assist in helping local
 26.6 governments in the identification and
 26.7 implementation of green practices within
 26.8 communities to reduce estrogenic chemical
 26.9 water pollution.

26.10 **Subd. 6. Aquatic and Terrestrial Invasive**
 26.11 **Species**

605,000

605,000

26.12 **(a) Improved Detection of Harmful**
 26.13 **Microbes in Ballast Water**

26.14 \$125,000 the first year and \$125,000 the
 26.15 second year are from the trust fund to the
 26.16 Board of Regents of the University of
 26.17 Minnesota for the University of Minnesota
 26.18 Duluth to identify and analyze potentially
 26.19 harmful bacteria transported into Lake
 26.20 Superior through ship ballast water
 26.21 discharge. This appropriation is available
 26.22 until June 30, 2014, by which time the
 26.23 project must be completed and final products
 26.24 delivered.

26.25 **(b) Emerald Ash Borer Biocontrol**
 26.26 **Research and Implementation**

26.27 \$250,000 the first year and \$250,000 the
 26.28 second year are from the trust fund to the
 26.29 commissioner of agriculture to assess a
 26.30 biocontrol method for suppressing emerald
 26.31 ash borers by testing bioagent winter survival
 26.32 potential, developing release and monitoring
 26.33 methods, and piloting implementation
 26.34 of emerald ash borer biocontrol. This
 26.35 appropriation is available until June 30,

27.1 2014, by which time the project must be
27.2 completed and final products delivered.

27.3 **(c) Emerald Ash Borer Landscape**

27.4 **Management Impacts**

27.5 \$170,000 the first year and \$170,000 the
27.6 second year are from the trust fund to the
27.7 Board of Regents of the University of
27.8 Minnesota to research impacts of insecticides
27.9 used for managing emerald ash borers on
27.10 other insects and birds. This appropriation
27.11 is available until June 30, 2014, by which
27.12 time the project must be completed and final
27.13 products delivered.

27.14 **(d) Evaluation of Switchgrass as Biofuel**

27.15 **Crop**

27.16 \$60,000 the first year and \$60,000 the second
27.17 year are from the trust fund to the Minnesota
27.18 State Colleges and Universities System for
27.19 Central Lakes College in cooperation with
27.20 the University of Minnesota to determine
27.21 the invasion risk of selectively bred
27.22 native grasses for biofuel production and
27.23 develop strategies to minimize the invasion
27.24 potential and impacts on biodiversity. This
27.25 appropriation is available until June 30,
27.26 2014, by which time the project must be
27.27 completed and final products delivered.

27.28 **Subd. 7. Renewable Energy and Air Quality** 925,000 925,000

27.29 **(a) Peatland Carbon Sequestration**

27.30 \$200,000 the first year and \$200,000 the
27.31 second year are from the trust fund to
27.32 the commissioner of natural resources in
27.33 cooperation with the University of Minnesota
27.34 to measure carbon uptake and methane

28.1 release in healthy and altered peatlands
 28.2 and develop strategies for landscape-level
 28.3 peatland restoration and carbon sequestration
 28.4 implementation. This appropriation is
 28.5 available until June 30, 2014, by which time
 28.6 the project must be completed and final
 28.7 products delivered.

28.8 **(b) Addressing Ozone Pollution in**
 28.9 **Minnesota**

28.10 \$125,000 the first year and \$125,000 the
 28.11 second year are from the trust fund to the
 28.12 Board of Regents of the University of
 28.13 Minnesota to research ozone pollution and
 28.14 exposure in Minnesota and examine the
 28.15 effectiveness and environmental equality of
 28.16 potential control options.

28.17 **(c) Optimizing Biogas Role in Meeting**
 28.18 **Minnesota's Energy Goals**

28.19 \$150,000 the first year and \$150,000 the
 28.20 second year are from the trust fund to the
 28.21 commissioner of natural resources for an
 28.22 agreement with the Great Plains Institute
 28.23 to evaluate market, technical, and policy
 28.24 barriers to broader adoption of biogas in
 28.25 meeting Minnesota's energy needs and
 28.26 develop recommendations for overcoming
 28.27 those barriers.

28.28 **(d) Supporting Community-Driven**
 28.29 **Sustainable Bioenergy Projects**

28.30 \$75,000 the first year and \$75,000 the
 28.31 second year are from the trust fund to
 28.32 the commissioner of natural resources
 28.33 for an agreement with Dovetail Partners,
 28.34 Inc. in cooperation with the University of
 28.35 Minnesota to assess feasibility, impacts,

29.1 and management needs of community-scale
 29.2 forest bioenergy systems through pilot
 29.3 studies in Ely and Cook County and to
 29.4 disseminate findings to inform related efforts
 29.5 in other communities.

29.6 **(e) Low Environmental Impact**

29.7 **Sustainable Neighborhoods**

29.8 \$125,000 the first year and \$125,000 the
 29.9 second year are from the trust fund to
 29.10 the Board of Regents of the University
 29.11 of Minnesota to assess the feasibility and
 29.12 conduct preliminary design for a replicable,
 29.13 cost-effective neighborhood-scale district
 29.14 system for energy, water, recycling, and
 29.15 waste that optimizes conservation and
 29.16 efficiency.

29.17 **(f) Conservation Corps Training and**

29.18 **Low-Income Solar Home-Heating**

29.19 **Installation**

29.20 \$250,000 the first year and \$250,000 the
 29.21 second year are from the trust fund to
 29.22 the commissioner of natural resources for
 29.23 an agreement with Conservation Corps
 29.24 Minnesota in cooperation with the Rural
 29.25 Renewable Energy Alliance to train corps
 29.26 members for renewable energy jobs and
 29.27 provide installation of solar heating systems
 29.28 for low-income families. An energy budget
 29.29 and cost savings calculation must be provided
 29.30 and, to the extent possible, the solar panel
 29.31 fabrication must be done in Minnesota.

29.32	<u>Subd. 8. Environmental Education</u>	<u>1,356,000</u>	<u>1,358,000</u>
-------	------------------------------------------------	------------------	------------------

29.33 **(a) Minnesota Schools Conserving Energy**
 29.34 **and Water**

30.1 \$412,000 the first year and \$413,000 the
30.2 second year are from the trust fund to the
30.3 commissioner of the Pollution Control
30.4 Agency for technical assistance and grants
30.5 to high school student-led teams to integrate
30.6 long-term energy and water conservation
30.7 savings into daily school operations,
30.8 create model school-utility partnerships,
30.9 and develop student leadership. This
30.10 appropriation is available until June 30,
30.11 2014, by which time the project must be
30.12 completed and final products delivered.

30.13 **(b) Youth-Led Renewable Energy and**
30.14 **Energy Conservation in West Central and**
30.15 **Southwest Minnesota**

30.16 \$123,000 the first year and \$123,000 the
30.17 second year are from the trust fund to
30.18 the commissioner of natural resources
30.19 for an agreement with Prairie Woods
30.20 Environmental Learning Center to initiate
30.21 youth-led renewable energy and conservation
30.22 projects in over thirty communities in west
30.23 central and southwest Minnesota.

30.24 **(c) Minnesota Junior Master Naturalist**
30.25 **Program**

30.26 \$182,000 the first year and \$183,000 the
30.27 second year are from the trust fund to the
30.28 Board of Regents of the University of
30.29 Minnesota to expand the junior naturalist
30.30 after-school programs. This appropriation
30.31 is available until June 30, 2014, by which
30.32 time the project must be completed and final
30.33 products delivered.

30.34 **(d) Experiential Environmental Education**
30.35 **for Urban Youth**

31.1 \$354,000 the first year and \$354,000 the
 31.2 second year are from the trust fund to
 31.3 the commissioner of natural resources for
 31.4 an agreement with Hennepin County in
 31.5 partnership with The City, Inc. to initiate new
 31.6 environmental education programs targeting
 31.7 inner-city youth that provide hands-on,
 31.8 experiential outdoor learning opportunities.
 31.9 This appropriation is available until June
 31.10 30, 2014, by which time the project must be
 31.11 completed and final products delivered.

31.12 **(e) Eagles Linking Students to Science and**
 31.13 **Nature**

31.14 \$85,000 the first year and \$85,000 the second
 31.15 year are from the trust fund to the Board
 31.16 of Regents of the University of Minnesota
 31.17 for The Raptor Center to engage students
 31.18 in exploring science and nature through
 31.19 curriculum built on real-life case studies of
 31.20 raptors treated at The Raptor Center and
 31.21 eagles tracked for post-release monitoring.

31.22 **(f) Cross-Cultural Cooperation in Fish**
 31.23 **and Wildlife Conservation**

31.24 \$200,000 the first year and \$200,000 the
 31.25 second year are from the trust fund to
 31.26 the commissioner of natural resources
 31.27 to collaborate with the Southeast Asian
 31.28 community on a tagging study and creel
 31.29 survey of white bass and to develop
 31.30 and implement cross-cultural training
 31.31 and workshops on hunting and fishing
 31.32 conservation regulations, ethics, and
 31.33 management. This appropriation is available
 31.34 until June 30, 2014, by which time the

32.1 project must be completed and final products
32.2 delivered.

32.3 Subd. 9. Administration and Contract
32.4 Management

701,000

701,000

32.5 (a) Legislative-Citizen Commission on
32.6 Minnesota Resources (LCCMR)

32.7 \$591,000 the first year and \$591,000 the
32.8 second year are from the trust fund to the
32.9 LCCMR for administration as provided
32.10 in Minnesota Statutes, section 116P.09,
32.11 subdivision 5.

32.12 (b) Contract Management

32.13 \$110,000 the first year and \$110,000 the
32.14 second year are from the trust fund to
32.15 the Legislative-Citizen Commission on
32.16 Minnesota Resources to contract with the
32.17 commissioner of natural resources for
32.18 expenses incurred for contract fiscal services
32.19 for the agreements specified in this section.

32.20 The contract management services must
32.21 be done on a reimbursement basis. This
32.22 appropriation is available until June 30,
32.23 2014, by which time the project must be
32.24 completed and final products delivered.

32.25 Subd. 10. Availability of Appropriations

32.26 Money appropriated in this section may
32.27 not be spent on activities unless they are
32.28 directly related to the specific appropriation
32.29 and are specified in the approved work
32.30 program. Money appropriated in this section
32.31 must not be spent on indirect costs or other
32.32 institutional overhead charges. Unless
32.33 otherwise provided, the amounts in this
32.34 section are available until June 30, 2013,
32.35 when projects must be completed and final

33.1 products delivered. For acquisition of real
33.2 property, the amounts in this section are
33.3 available until June 30, 2014, if a binding
33.4 contract is entered into by June 30, 2013,
33.5 and closed not later than June 30, 2014. If
33.6 a project receives a federal grant, the time
33.7 period of the appropriation is extended to
33.8 equal the federal grant period.

33.9 **Subd. 11. Data Availability Requirements**

33.10 Data collected by the projects funded under
33.11 this section must conform to guidelines and
33.12 standards adopted by the Office of Enterprise
33.13 Technology. Spatial data also must conform
33.14 to additional guidelines and standards
33.15 designed to support data coordination and
33.16 distribution that have been published by the
33.17 Minnesota Geospatial Information Office.

33.18 Descriptions of spatial data must be prepared
33.19 as specified in the state's geographic metadata
33.20 guideline and must be submitted to the
33.21 Minnesota Geospatial Information Office.

33.22 All data must be accessible and free to the
33.23 public unless made private under the Data
33.24 Practices Act, Minnesota Statutes, chapter
33.25 13.

33.26 To the extent practicable, summary data and
33.27 results of projects funded under this section
33.28 should be readily accessible on the Internet
33.29 and identified as an environment and natural
33.30 resources trust fund project.

33.31 **Subd. 12. Project Requirements**

33.32 (a) As a condition of accepting an
33.33 appropriation under this section, any agency
33.34 or entity receiving an appropriation or a
33.35 party to an agreement from an appropriation

34.1 must comply with paragraphs (b) to (l) and
34.2 Minnesota Statutes, chapter 116P, and must
34.3 submit a work program and semiannual
34.4 progress reports in the form determined
34.5 by the Legislative-Citizen Commission on
34.6 Minnesota Resources for any project funded
34.7 in whole or in part with funds from the
34.8 appropriation.

34.9 (b) To the extent possible, a person
34.10 conducting restoration with money
34.11 appropriated under this section must plant
34.12 vegetation only of ecotypes native to
34.13 Minnesota and preferably of the local
34.14 ecotype using a high diversity of species
34.15 originating as close to the restoration site as
34.16 possible and, when restoring prairies, protect
34.17 existing prairies from genetic contamination.
34.18 Use of seeds and plant materials beyond these
34.19 requirements must be expressly approved in
34.20 the work program.

34.21 (c) For all restorations conducted with money
34.22 appropriated under this section, a recipient
34.23 must prepare an ecological restoration
34.24 and management plan that, to the degree
34.25 practicable, is consistent with the highest
34.26 quality conservation and ecological goals for
34.27 the restoration site. Consideration should
34.28 be given to soil, geology, topography, and
34.29 other relevant factors that would provide
34.30 the best chance for long-term success of the
34.31 restoration projects. The plan must include
34.32 the proposed timetable for implementing
34.33 the restoration, including site preparation,
34.34 establishment of diverse plant species,
34.35 maintenance, and additional enhancement to
34.36 establish the restoration; identify long-term

35.1 maintenance and management needs of
35.2 the restoration and how the maintenance,
35.3 management, and enhancement will be
35.4 financed; and take advantage of the best
35.5 available science and include innovative
35.6 techniques to achieve the best restoration.

35.7 (d) Any entity receiving an appropriation in
35.8 this section for restoration activities must
35.9 provide an initial restoration evaluation
35.10 at the completion of the appropriation
35.11 and an evaluation three years beyond the
35.12 completion of the expenditure. Restorations
35.13 must be evaluated relative to the stated
35.14 goals and standards in the restoration plan,
35.15 current science, and, when applicable, the
35.16 Board of Water and Soil Resources' native
35.17 vegetation establishment and enhancement
35.18 guidelines. The evaluation shall determine
35.19 whether the restorations are meeting planned
35.20 goals, identify any problems with the
35.21 implementation of the restorations, and,
35.22 if necessary, give recommendations on
35.23 improving restorations. The evaluation shall
35.24 be focused on improving future restorations.

35.25 (e) Except as otherwise provided in this
35.26 section, all restoration and enhancement
35.27 projects funded with money appropriated in
35.28 this section must be on land permanently
35.29 protected by a conservation easement or
35.30 public ownership or in public waters as
35.31 defined in Minnesota Statutes, section
35.32 103G.005, subdivision 15.

35.33 (f) A recipient of money from an
35.34 appropriation under this section must
35.35 give consideration to contracting with

36.1 Conservation Corps Minnesota or its
36.2 successor for contract restoration and
36.3 enhancement services.

36.4 (g) All conservation easements acquired with
36.5 money appropriated under this section must:

36.6 (1) be perpetual;

36.7 (2) specify the parties to an easement in the
36.8 easement;

36.9 (3) specify all of the provisions of an
36.10 agreement that are perpetual;

36.11 (4) be sent to the Office of the
36.12 Legislative-Citizen Commission on
36.13 Minnesota Resources in an electronic format;

36.14 (5) include a long-term monitoring and
36.15 enforcement plan and funding for monitoring
36.16 and enforcing the easement agreement; and

36.17 (6) include requirements in the easement
36.18 document to address specific water quality
36.19 protection activities such as keeping water
36.20 on the landscape, reducing nutrient and
36.21 contaminant loading, protecting groundwater,
36.22 and not permitting artificial hydrological
36.23 modifications.

36.24 (h) For any acquisition of land or interest in
36.25 land, a recipient of money appropriated under
36.26 this section must give priority to high quality
36.27 natural resources or conservation lands that
36.28 provide natural buffers to water resources.

36.29 (i) For new lands acquired with money
36.30 appropriated under this section, a recipient
36.31 must prepare a restoration and management
36.32 plan in compliance with paragraph
36.33 (c), including sufficient funding for
36.34 implementation unless the work program

37.1 addresses why a portion of the money is
37.2 not necessary to achieve a high quality
37.3 restoration.

37.4 (j) To the extent an appropriation is used to
37.5 acquire an interest in real property, a recipient
37.6 of an appropriation under this section must
37.7 provide to the Legislative-Citizen
37.8 Commission on Minnesota Resources and
37.9 the commissioner of management and budget
37.10 an analysis of increased operations and
37.11 maintenance costs likely to be incurred by
37.12 public entities as a result of the acquisition
37.13 and how these costs are to be paid.

37.14 (k) To ensure public accountability for the
37.15 use of public funds, a recipient of money
37.16 appropriated under this section must provide
37.17 to the Legislative-Citizen Commission on
37.18 Minnesota Resources documentation of the
37.19 selection process used to identify parcels
37.20 acquired and provide documentation of all
37.21 related transaction costs, including but not
37.22 limited to appraisals, legal fees, recording
37.23 fees, commissions, other similar costs,
37.24 and donations. This information must be
37.25 provided for all parties involved in the
37.26 transaction. The recipient must also report
37.27 to the Legislative-Citizen Commission on
37.28 Minnesota Resources any difference between
37.29 the acquisition amount paid to the seller
37.30 and the state-certified or state-reviewed
37.31 appraisal, if a state-certified or state-reviewed
37.32 appraisal was conducted. Acquisition data
37.33 such as appraisals may remain private
37.34 during negotiations but must ultimately
37.35 be made public according to Minnesota
37.36 Statutes, chapter 13. The Legislative-Citizen

38.1 Commission on Minnesota Resources shall
38.2 review the requirement in this paragraph
38.3 and provide a recommendation on whether
38.4 to continue or modify the requirement in
38.5 future years. The commission may waive
38.6 the application of this paragraph for specific
38.7 projects.

38.8 (1) A recipient of an appropriation from
38.9 the trust fund under this section must
38.10 acknowledge financial support from the
38.11 Minnesota environment and natural resources
38.12 trust fund in project publications, signage,
38.13 and other public communications and
38.14 outreach related to work completed using the
38.15 appropriation. Acknowledgment may occur,
38.16 as appropriate, through use of the trust fund
38.17 logo or inclusion of language attributing
38.18 support from the trust fund.

38.19 **Subd. 13. Payment Conditions and Capital**
38.20 **Equipment Expenditures**

38.21 All agreements, grants, or contracts referred
38.22 to in this section must be administered on
38.23 a reimbursement basis unless otherwise
38.24 provided in this section. Notwithstanding
38.25 Minnesota Statutes, section 16A.41,
38.26 expenditures made on or after July 1,
38.27 2011, or the date the work program is
38.28 approved, whichever is later, are eligible for
38.29 reimbursement unless otherwise provided
38.30 in this section. Periodic payment must
38.31 be made upon receiving documentation
38.32 that the deliverable items articulated in
38.33 the approved work program have been
38.34 achieved, including partial achievements
38.35 as evidenced by approved progress reports.
38.36 Reasonable amounts may be advanced to

39.1 projects to accommodate cash flow needs or
 39.2 match federal money. The advances must
 39.3 be approved as part of the work program.
 39.4 No expenditures for capital equipment are
 39.5 allowed unless expressly authorized in the
 39.6 project work program.

39.7 **Subd. 14. Purchase of Recycled and Recyclable**
 39.8 **Materials**

39.9 A political subdivision, public or private
 39.10 corporation, or other entity that receives an
 39.11 appropriation under this section must use the
 39.12 appropriation in compliance with Minnesota
 39.13 Statutes, section 16B.121, regarding
 39.14 purchase of recycled, repairable, and durable
 39.15 materials; and Minnesota Statutes, section
 39.16 16B.122, regarding purchase and use of
 39.17 paper stock and printing.

39.18 **Subd. 15. Energy Conservation and**
 39.19 **Sustainable Building Guidelines**

39.20 A recipient to whom an appropriation is made
 39.21 under this section for a capital improvement
 39.22 project must ensure that the project complies
 39.23 with the applicable energy conservation and
 39.24 sustainable building guidelines and standards
 39.25 contained in law, including Minnesota
 39.26 Statutes, sections 16B.325, 216C.19, and
 39.27 216C.20, and rules adopted under those
 39.28 sections. The recipient may use the energy
 39.29 planning, advocacy, and State Energy Office
 39.30 units of the Department of Commerce to
 39.31 obtain information and technical assistance
 39.32 on energy conservation and alternative
 39.33 energy development relating to the planning
 39.34 and construction of the capital improvement
 39.35 project.

39.36 **Subd. 16. Accessibility**

40.1 Structural and nonstructural facilities must
40.2 meet the design standards in the Americans
40.3 with Disabilities Act (ADA) accessibility
40.4 guidelines.

40.5 **Subd. 17. Carryforward**

40.6 (a) The availability of the appropriation for
40.7 the following projects is extended to June
40.8 30, 2012:

40.9 (1) Laws 2008, chapter 367, section
40.10 2, subdivision 4, paragraph (f), Native
40.11 Shoreland Buffer Incentives Program;

40.12 (2) Laws 2009, chapter 143, section 2,
40.13 subdivision 4, paragraph (a), State Park
40.14 Acquisition;

40.15 (3) Laws 2009, chapter 143, section 2,
40.16 subdivision 4, paragraph (b), State Trail
40.17 Acquisition; and

40.18 (4) Laws 2009, chapter 143, section 2,
40.19 subdivision 8, paragraph (a), Contract
40.20 Management.

40.21 (b) The availability of the appropriation for
40.22 the following project is extended to June
40.23 30, 2013: Laws 2010, chapter 362, section
40.24 2, subdivision 8, paragraph (f), Expanding
40.25 Outdoor Classrooms at Minnesota Schools.

VI. Revenues and Distributions

“the source and amount of all revenues collected and distributed by the commission, including all administrative and other expenses;”

Dollars Available from the Environment and Natural Resources Trust Fund
Total \$'s Available for Current Recommendations: up to \$50,656,000

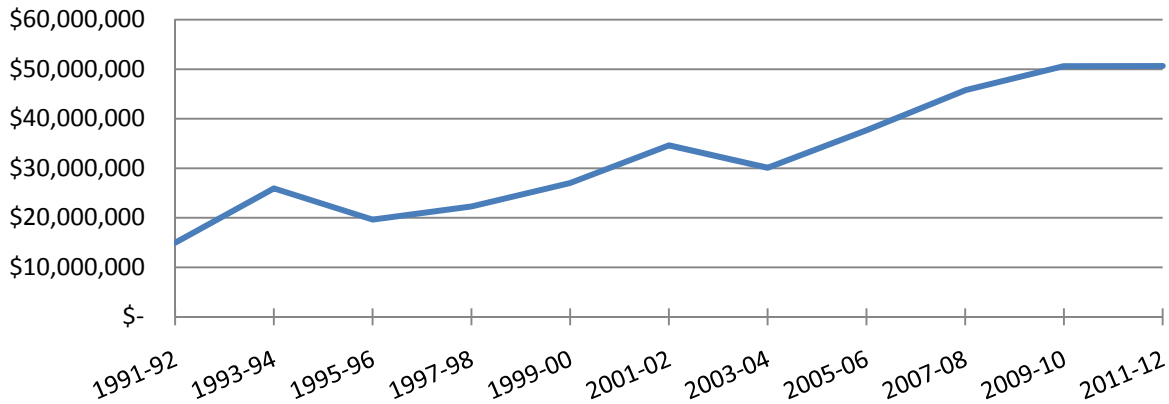
Basis

The Minnesota Constitution provides that up to 5.5% of the market value of the Environment and Natural Resources Trust Fund can be utilized for projects each year. This 5.5% value is determined for both years of each fiscal biennium based on the market value of the Trust Fund on June 30 one year prior to the start of the next fiscal biennium. Thus the dollars available for appropriation during fiscal years 2012 (beginning July 1, 2011) and 2013 (beginning July 1, 2012) was determined on June 30, 2010.

Value of the Environment and Natural Resources Trust Fund on June 30, 2010 =	\$460,515,847.35
5.5% of value on June 30, 2010 =	\$25,328,371.60
\$ Amount to be used for FY 2012-2013 LCCMR recommendations (rounded down to nearest thousandth) =	\$25,328,000/year
Total \$'s available for recommendation during fiscal 2012-2013 biennium =	\$50,656,000

History

**ENRTF \$'s Appropriated/Available*
per Biennial Appropriation Calendar Years**



Biennial Appropriation Calendar Years	\$'s Appropriated/Available*
1991-92	\$ 14,960,000
1993-94	\$ 25,946,000
1995-96	\$ 19,649,000
1997-98	\$ 22,270,000
1999-00	\$ 27,001,000
2001-02	\$ 34,620,000
2003-04	\$ 30,100,000
2005-06	\$ 37,657,000
2007-08	\$ 45,732,000
2009-10	\$ 50,636,000
2011-12	\$ 50,656,000
TOTAL	\$ 359,227,000

*\$ amount for all bienniums except 2011-12 reflects the actual dollar amounts appropriated; dollars available for that biennium was higher in some cases. \$ amount for 2011-12 reflects that dollars available to be appropriated.

Appropriations from Revenue Sources

Appropriation Year	Environment and Natural Resources Trust Fund	Future Resources Fund	Oil Overcharge Money	Land & Water Conservation (LAWCON)	Great Lakes Protection Account	Totals
LEGISLATIVE COMMISSION ON MINNESOTA RESOURCES (LCMR) - Biennial funding cycle						
1991						
Ch 254 Art. 1 Sec. 14	14,960,000	16,534,000	3,500,000		0	34,994,000
1993						
Ch 174 Sec. 14	24,600,000	14,662,000	2,012,000		0	41,274,000
1994						
Ch 632 Art. 2 Sec. 6	1,346,000	1,404,000	0		0	2,750,000
1995						
Ch 229 Sec. 19, 20, 21	17,844,000	15,083,000	2,055,000		130,000	35,112,000
1st. Sp.Ses., Ch. 2, Sec. 5	175,000					175,000
1996						
Ch 407 Sec. 8	1,630,000	3,258,000	0		0	4,888,000
1997						
Ch 216 Sec. 15	22,270,000	14,668,000	150,000		120,000	37,208,000
Ch 246, Sec. 32		150,000				150,000
1999 *	(1)					
Ch 231, Sec. 16	26,010,000	16,040,000	0		200,000	42,250,000
Ch 231, Sec. 17	991,000					991,000
2001	(2)					
1st. Sp.Ses., Ch. 2, Sec. 14	34,620,000	15,385,000	180,000		87,000	50,272,000
2002						
Ch. 220, Art. 8, Sec. 1 & 8	316,000	0	0		0	316,000
2003	(3)					
Ch. 128, Art. 1, Sec. 9	30,100,000	17,870,000 (3)	519,000	2,000,000 (4)	56,000	50,545,000
		0				32,675,000
2005	(5)					
1st. Sp.Ses., Ch. 1, Art. 2, Sec. 11	33,560,000	0	0	1,600,000 (4)	0	35,160,000
2006						
Ch. 243, Sec. 19 & 20	4,097,000	0	0	0	28,000	4,125,000
LEGISLATIVE-CITIZEN COMMISSION ON MINNESOTA RESOURCES (LCCMR) - Annual funding cycle						
2007						
Ch. 30, Sec. 2	22,866,000	0	0	500,000 (4)	0	23,366,000
2008						
Ch.367, Sec. 2	22,866,000	0	0	0	86,000	22,952,000
2009						
Ch.143, Sec. 2	(6)	25,622,000	0	400,000	66,000	26,088,000
2010						
Ch.362, Sec. 2	(7)	25,622,000	0	0	0	25,622,000
		309,495,000	115,054,000	8,416,000	4,500,000	773,000
						368,658,000

NOTE: Does not reflect vetoes below.

(1) 1999 Veto
 350,000 TF
 200,000 TF
1,200,000 FRF
 1,750,000

(2) 2001 Veto
 275,000 FRF
455,000 TF
 730,000

(3) 2003 Future Resource Fund was redirected to the General Fund, not to be recommended by the LCMR per ML 2003, Ch. 128, Art. 1, Sec. 146 & Sec. 155.

(4) Previous to 2003, the LAWCON money was included in the Future Resource Fund appropriation for purposes of this chart.

(5) Note: Does reflect the vetoes

2005 Veto
 4,098,000 TF
28,000 GLPA
 4,126,000

(6) 2009 Veto
 275,000 TF
143,000 TF
 418,000

(7) 2010 Veto
 143,000 TF

Appropriations for LCMR and LCCMR Administrative Expenses

Statutory reference MS 116P

The amounts shown here are part of the total appropriation

	Appropriation Year	Environment & Natural Resources		Future	Biennium Total
		Trust Fund	Carryforward	Resources Fund	
LCMR	1991	0		850,000	850,000
LCMR	1993	270,000		425,000	695,000
LCMR	1995	394,000		308,000	702,000
LCMR	1997	472,000		304,000	776,000
LCMR	1999	567,000		333,000	900,000
LCMR	2001	738,000		389,000	1,127,000
LCMR	2003	672,000	172,000 **	0 *	844,000
LCMR	2005 (annual)	449,000		0	449,000 ***
LCCMR	2006 (annual)	550,000	63,000 ****	0	613,000
LCCMR	2007 (biennial)	1,278,000		0	1,278,000
LCCMR	2009 (biennial)	1,254,000		0	1,254,000
LCCMR	2011 Proposed (biennial)	1,182,000		0	1,182,000
	Total	7,826,000	235,000	2,609,000	10,670,000

NOTES:

- 1991-2003 reflects a biennial appropriation
- 2005 and 2006 are annual appropriations
- The administrative budget from the Trust Fund is capped at 4% of the Trust Fund available each year, M.S. 116P, Subd. 5

* Future Resources Fund was redirected to the General Budget, not to be recommended by the LCMR per ML 2003, Ch. 128, Art. 1, Sec. 146 & Sec. 155.

** Carryforward from administrative budget appropriation 02-03 (Trust Fund)

*** This amount reflects only first year funding. The governor vetoed the second half of the biennium funding of the administrative budget (\$450,000).

**** Carryforward from 2005 administrative appropriation for LCMR and the "Citizen Advisory Committee for the Trust Fund"

VII. Assets & Liabilities

“a description of the assets and liabilities of the trust fund;”

The following documents are from the State Board of Investment 2010 and 2009 Annual Reports.

Historical Market Value of the Environment and Natural Resources Trust Fund

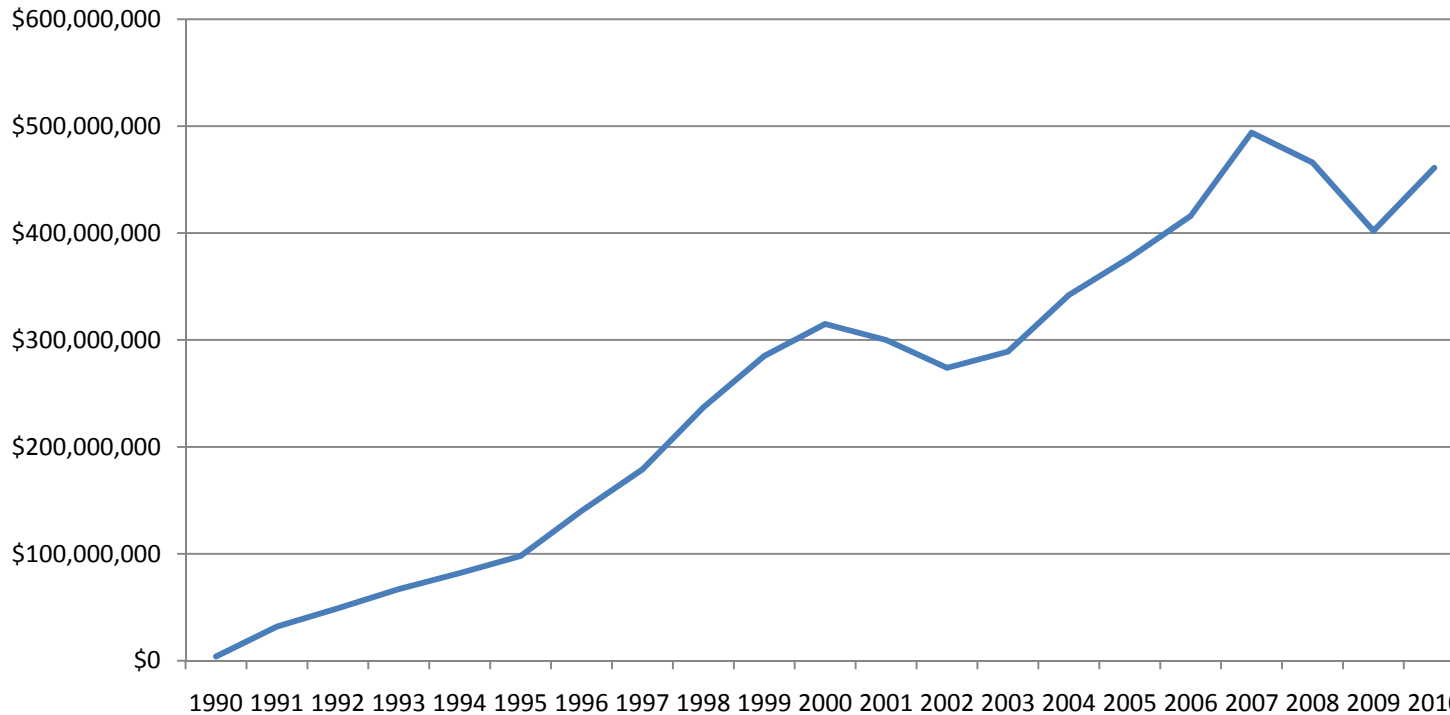
Background

The assets in the Environment and Natural Resources Trust Fund (ENRTF) originate from a combination of contributions and investment income. Forty percent of the net proceeds from the Minnesota State Lottery, or approximately 7 cents of every dollar spent on playing the lottery, are contributed to the ENRTF each year; this source of contribution is guaranteed by the Minnesota Constitution through December 31, 2024. The ENRTF may also receive contributions from other sources, such as private donations. Once deposited into the ENRTF, contributions become part of the principal balance and are invested in a combination of stocks and bonds by the State Board of Investment. The income generated from those investments is reinvested back into the Trust Fund.

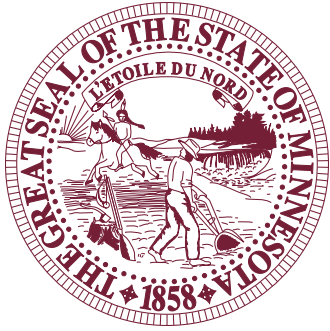
For FY 1992-1999, investment earnings of the ENRTF and up to 25% of the Minnesota Lottery’s annual contributions to the ENRTF were available for appropriation each year. A constitutional amendment in 1998 altered this rule so that beginning in FY 2000, through the present, up to 5.5% of the ENRTF’s market value (determined by the market value of the ENRTF on June 30 one year before the start of a biennium) is available for appropriation each year.

History

**Environment and Natural Resources Trust Fund
Market Value (Rounded) on June 30 of Each Year**



ENRTF Market Value (Rounded) on June 30 of each year	
1990	\$4,000,000
1991	\$32,000,000
1992	\$49,000,000
1993	\$67,000,000
1994	\$82,000,000
1995	\$98,000,000
1996	\$140,000,000
1997	\$179,000,000
1998	\$237,000,000
1999	\$285,000,000
2000	\$315,000,000
2001	\$300,000,000
2002	\$274,000,000
2003	\$289,000,000
2004	\$342,000,000
2005	\$377,000,000
2006	\$416,000,000
2007	\$494,000,000
2008	\$466,000,000
2009	\$402,000,000
2010	\$461,000,000



Minnesota State Board of Investment

20% Annual Report

**Minnesota
State Board
of Investment**

60 Empire Drive
Suite 355
St. Paul, MN 55103

Phone: 651-296-3328

Fax: 651-296-9572

E-mail: minn.sbi@state.mn.us

Website: www.sbi.state.mn.us

Environmental Trust Fund

The Environmental Trust Fund was established in 1988 by the Minnesota Legislature to provide a long-term, consistent and stable source of funding for activities that protect and enhance the environment. On June 30, 2010, the market value of the Fund was \$461 million.

By statute, the State Board of Investment invests the assets of the Environmental Trust Fund. The Legislature funds environmental projects from a portion of the market value of the Fund.

Investment Objective

The Environmental Trust Fund's investment objective is long-term growth in order to produce a growing level of spending within the constraints of maintaining adequate portfolio quality and liquidity.

Investment Constraints

A constitutional amendment passed in November 1998 continues the mandate that 40 percent of the net proceeds from the state lottery be credited to the Fund through 2025.

The amendment provides for spending 5.5 percent of the Fund's market value annually. The amendment eliminated accounting restrictions on capital gains and losses and the provision that the principal must remain inviolate.

Asset Allocation

After the constitutional amendment was adopted in November 1998, SBI staff worked with the Legislative Citizen Commission on Minnesota Resources to establish an asset allocation policy that is consistent with the Commission's goals for spending and growth of the Fund. The SBI uses a 70%

stock, 28% fixed income and 2% cash asset allocation for the Fund. The allocation positions the Fund for the best long-term growth potential while meeting the objective of the Fund to produce a growing level of spending.

Figure 35 presents the actual asset mix of the Fund at the end of fiscal year 2010. The current long term asset allocation targets for the Fund are:

Domestic Stocks	70%
Domestic Bonds	28
Cash	2

Investment Management

SBI staff internally manages all assets of the Environmental Trust Fund. Given the unique constraints of the Fund, management by SBI staff is considered to be the most cost effective at this time.

Stock Segment

The stock segment of the Fund is passively managed to track the performance of the S&P 500.

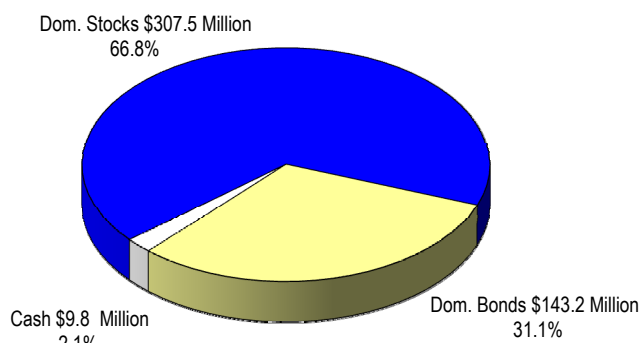
Bond Segment

The bond segment is actively managed to add incremental value through sector, security and yield curve decisions, and its performance is measured against the Barclays Capital Aggregate Bond Index.

Investment Performance

During the fiscal year, the *stock* segment underperformed its S&P 500 benchmark by 0.2 percentage point. By investing in all of the stocks in the benchmark at their index weighting, the segment attempts to track the benchmark return on a monthly and annual basis. The portfolio is periodically rebalanced to maintain an acceptable tracking error relative

Figure 35. Environmental Trust Fund Asset Mix as of June 30, 2010



Note: Percentages may differ slightly due to rounding of values.

Environmental Trust Fund

to the benchmark subject to keeping trading costs at a minimum.

The *bond* segment outperformed its benchmark by 0.2 percentage points during the fiscal year; primarily due to an overweight to the commercial mortgage backed securities sector.

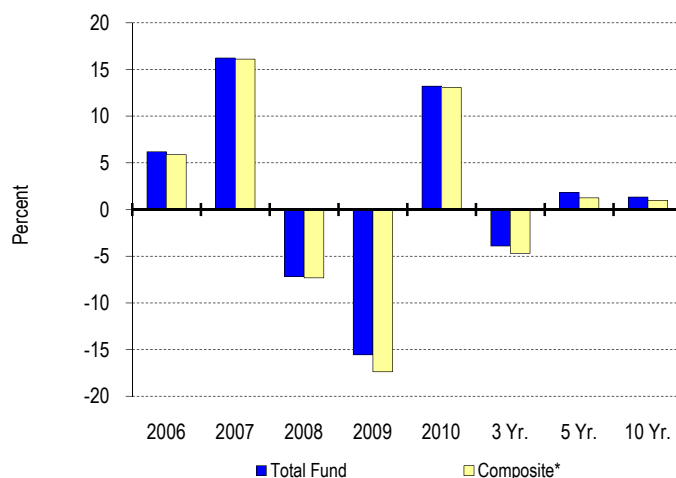
Overall, the Environmental Trust Fund provided a return of 13.2% for fiscal year 2010, outperforming its composite index by 0.1 percentage point. For the most recent three-year period, the Fund trailed its composite benchmark by 0.8 percentage point. The Fund experienced modest outperformance over the last five and ten years due to the incremental value added by both the stock and bond segments.

Performance results are presented in Figure 36.

Spendable income generated by the Fund over the last five fiscal years is shown below:

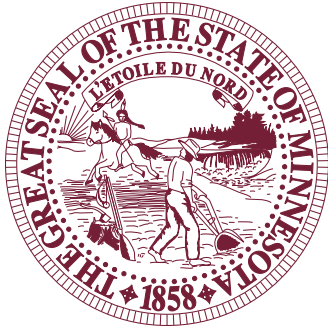
Fiscal Year	Millions
2006	\$19
2007	\$19
2008	\$23
2009	\$23
2010	\$26

Figure 36. Environmental Trust Fund Performance FY 2006-2010



	2006	2007	2008	2009	2010	3 Yr.	5 Yr.	10 Yr.
Total Fund	6.2%	16.2%	-7.2%	-15.6%	13.2%	-3.9%	1.8%	1.3%
Composite*	5.9	16.1	-7.3	-17.4	13.1	-4.7	1.3	1.0
Stock Segment	8.7	20.6	-13.1	-25.8	14.2	-9.7	-0.7	-1.5
S&P 500	8.6	20.6	-13.1	-26.2	14.4	-9.8	-0.8	-1.6
Bond Segment	0.5	6.2	7.0	8.3	9.7	8.3	6.3	7.0
Barclays Agg.	-0.8	6.1	7.1	6.0	9.5	7.5	5.5	6.5

* Weighted 70% S&P 500/ 28% Barclays Capital Aggregate/ and 2% 3 month T-Bill.



Minnesota State Board of Investment

2009 Annual Report

**Minnesota
State Board
of Investment**

60 Empire Drive
Suite 355
St. Paul, MN 55103

Phone: 651-296-3328

Fax: 651-296-9572

E-mail: minn.sbi@state.mn.us

Website: www.sbi.state.mn.us

Environmental Trust Fund

The Environmental Trust Fund was established in 1988 by the Minnesota Legislature to provide a long-term, consistent and stable source of funding for activities that protect and enhance the environment. On June 30, 2009, the market value of the Fund was \$402 million.

By statute, the State Board of Investment invests the assets of the Environmental Trust Fund. The Legislature funds environmental projects from a portion of the market value of the Fund.

Investment Objective

The Environmental Trust Fund's investment objective is long-term growth in order to produce a growing level of spending within the constraints of maintaining adequate portfolio quality and liquidity.

Investment Constraints

A constitutional amendment passed in November 1998 continues the mandate that 40 percent of the net proceeds from the state lottery be credited to the Fund through 2025.

The amendment provides for spending 5.5 percent of the Fund's market value annually. The amendment eliminated accounting restrictions on capital gains and losses and the provision that the principal must remain inviolate.

Asset Allocation

After the constitutional amendment was adopted in November 1998, SBI staff worked with the Legislative Citizen Commission on Minnesota Resources to establish an asset allocation policy that is consistent with the Commission's goals for spending and growth of the Fund. The SBI uses a 70% stock, 28%

fixed income and 2% cash asset allocation for the Fund. The allocation positions the Fund for the best long-term growth potential while meeting the objective of the Fund to produce a growing level of spending.

Figure 32 presents the actual asset mix of the Fund at the end of fiscal year 2008. The current long term asset allocation targets for the Fund are:

Domestic Stocks	70%
Domestic Bonds	28
Cash	2

Investment Management

SBI staff internally manages all assets of the Environmental Trust Fund. Given the unique constraints of the Fund, management by SBI staff is considered to be the most cost effective at this time.

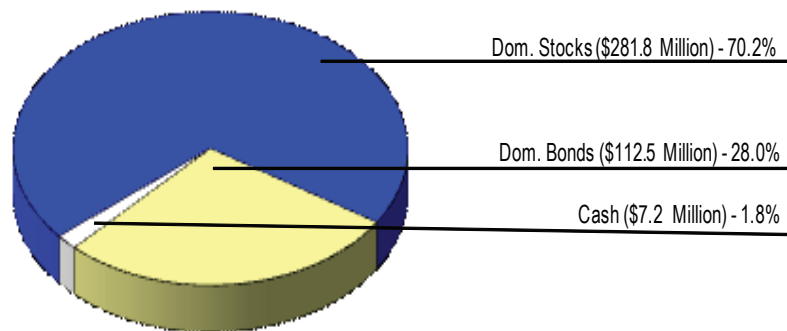
Stock Segment

The stock segment of the Fund is passively managed to track the performance of the S&P 500.

Bond Segment

The bond segment is actively managed to add incremental value through sector, security and yield curve decisions and its performance is measured against the Barclays Capital Aggregate Bond Index.

Figure 32. Environmental Trust Fund Asset Mix as of June 30, 2009



Note: Percentages may differ slightly due to rounding of values.

Environmental Trust Fund

Investment Performance

During the fiscal year, the *stock* segment outperformed its S&P 500 benchmark by 0.4 percentage point. By investing in all of the stocks in the benchmark at their index weighting, the segment attempts to track the benchmark return on a monthly and annual basis. The portfolio is periodically rebalanced to maintain an acceptable tracking error relative to the benchmark subject to keeping trading costs at a minimum.

The *bond* segment outperformed its benchmark by 2.3 percentage points during the fiscal year.

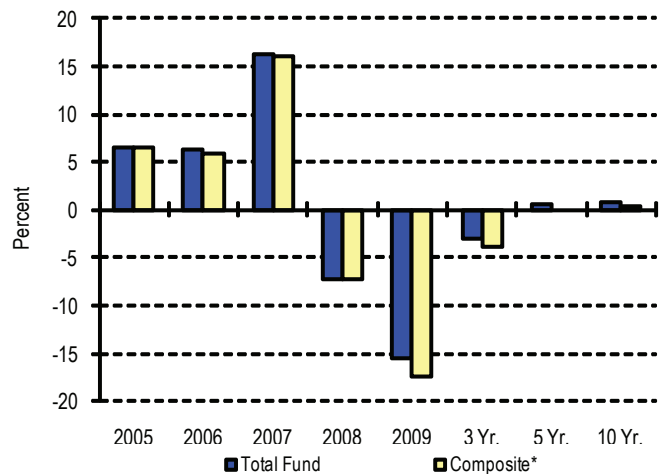
Overall, the Environmental Trust Fund provided a return of -15.6% for fiscal year 2009, outperforming its composite index by 1.8 percentage points. For the most recent three-year period, the Fund exceeded its composite benchmark by 0.7 percentage point. The Fund experienced modest outperformance over the last five and ten years due to the incremental value added by both the stock and bond segments.

Performance results are presented in Figure 33.

Spendable income generated by the Fund over the last five fiscal years is shown below:

Fiscal Year	Millions
2005	\$15
2006	\$19
2007	\$19
2008	\$22
2009	\$23

Figure 33. Environmental Trust Fund Performance FY 2005-2009



	2005	2006	2007	2008	2009	3 Yr.	5 Yr.	10 Yr.
Total Fund	6.5%	6.2%	16.2%	-7.2%	-15.6%	-3.1%	0.6%	0.7%
Composite*	6.5	5.9	16.1	-7.3	-17.4	-3.8	0.0	0.4
Stock Segment	6.3	8.7	20.6	-13.1	-25.8	-8.0	-2.1	-2.1
S&P 500	6.3	8.6	20.6	-13.1	-26.2	-8.2	-2.2	-2.2
Bond Segment	7.0	0.5	6.2	7.0	8.3	7.2	5.8	6.5
Barclays Agg.	6.8	-0.8	6.1	7.1	6.0	6.4	5.0	6.0

* Weighted 70% S&P 500/ 28% Barclays Capital Aggregate/ and 2% 3 month T-Bill.

VIII. Findings

“any findings or recommendations that are deemed proper to assist the legislature in formulating legislation;”

LCCMR action on July 13, 2010: A proposal submitted to the LCCMR titled: “New Generation in Water Supply Management – Pilot Studies” for \$986,500 from the Department of Natural Resources is recommended to the Governor and Legislature for funding from the Clean Water Fund.

Summary for “New Generation in Water Supply Management – Pilot Studies”:

This proposal will develop a new approach for sustainable water management planning across governmental jurisdictions and link users and citizens in water management decisions that are unique to their area.

The proposal is included in VIII. Findings.

**Environment and Natural Resources Trust Fund
2011-2012 Request for Proposals (RFP)**

LCCMR ID: 027-B

Project Title: New Generation in Water Supply Management-Pilot Studies

Category: B. Water Resources

Total Project Budget: \$ \$986,500

Proposed Project Time Period for the Funding Requested: 2 yrs, July 2011 - June 2013

Other Non-State Funds: \$ 0

Summary:

This proposal will develop a new approach for sustainable water management planning across governmental jurisdictions and link users and citizens in water management decisions that are unique to their area.

Name: Laurel Reeves

Sponsoring Organization: DNR

Address: 500 Lafayette Rd
Saint Paul MN 55155-4032

Telephone Number: 651-259-5692

Email laurel.reeves@state.mn.us

Web Address www.dnr.state.mn.us

Location

Region: NW, Central

Ecological Section: Red River Valley (251A), North Central Glaciated Plains (251B)

County Name: Clay, Kandiyohi, Pope, Stearns, Wilkin

City / Township:

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

MAIN PROPOSAL

PROJECT TITLE: NEW GENERATION IN WATER SUPPLY MANAGEMENT – PILOT STUDIES

I. PROJECT STATEMENT

In order to conserve and yet sustainably utilize our water supply resources, a new generation of water supply management strategies is needed. This proposal seeks to develop and implement new guidance for water management across governmental jurisdictions and natural hydrologic units. Traditional water management is based on political boundaries and location-specific uses. Future water management will likely be based on ground and surface watersheds and analysis of cumulative impacts. The natural management unit for groundwater is the aquifer, which may extend across political, ecological and surface watershed boundaries. Two pilot study areas, the Bonanza Valley and the Buffalo Aquifer, have been selected to develop these new strategies.

Objectives and results: The Bonanza Valley and the Buffalo Aquifer pilot studies will:

- a. research, monitor and evaluate ground and surface water interaction, potential vulnerabilities and sustainable use,
- b. research potential pumping induced movement of contaminants through complex confined, leaky aquifers,
- c. investigate the hydrologic properties of confining beds (aquitards) in relationship to confined, leaky and unconfined aquifers,
- d. assemble decision support tools to help with local planning,
- e. establish locally supported water management plans for each study area,
- f. design management guidance that will be easily applied to other places with similar problems.

The Bonanza Valley pilot study area is in Stearns, Pope and Kandiyohi Counties where water supply and quality issues have recently come to light but are not well understood. Community interest is growing but uncertain. This area is often considered to be water rich and, until recently, has supported agricultural irrigation without measured impact to other users or ecologic resources; however, several years of reduced precipitation and increased irrigation resulted in water use conflicts. Previous studies and ongoing work in this area include:

- county geologic atlases in Stearns and Pope Counties,
- United States Geological Survey (USGS) historical streamgage data, historical studies and hydrologic model,
- DNR groundwater level monitoring network in all three counties,
- DNR streamflow and groundwater level readings in 2008 to 2010, gathered to address water use conflicts.

The Buffalo Aquifer pilot study area includes portions of Clay and Wilkin Counties. Many communities and water users are involved and interested. Stakeholders want to balance water use from surface water and groundwater to maintain an adequate water supply for all users and the area's economic integrity during a prolonged drought similar to that of the 1930s. The City of Moorhead and Clay County are active partners in this project. Previous studies and ongoing work in this area include:

- county geologic atlas in progress for Clay County,
- regional hydrogeologic assessment of the southern Red River Valley,
- USGS historical streamgage data, historical studies and hydrologic model,
- Department of Natural Resources (DNR) groundwater level monitoring network in both counties,
- TMDL study in the Buffalo River Watershed.

Additional objectives and results of the Bonanza Valley and the Buffalo Aquifer pilot studies are to:

- g. better use of land and water vulnerability and sustainability information in decision making,
- h. develop more knowledgeable and engaged citizens,
- i. link studies and data to predict future impacts,
- j. provide more tools and products to guide land and water management plans,
- k. improve information sharing between partners and provide public web access to standardized data.

II. DESCRIPTION OF PROJECT RESULTS

Activity 1: Data collection and compilation for each pilot study area **Budget:** \$ 563,000
Compile and prepare for input into the hydrologic model the results of past and ongoing data collection. Perform geochemical and age-dating analyses. Gather additional streamflow and groundwater data.

Outcome**Completion Date**

- | | |
|-------------------------------------------------------------------------------------|--------------------|
| 1. Additional stations and wells installed, aquifer testing conducted. | April 30, 2012 |
| 2. Existing data compiled and transferred into a usable format for hydrologic model | September 30, 2011 |

Activity 2: Develop hydrologic models for each pilot study area**Budget:** \$ 254,000

The USGS will develop hydrologic models for each study area. These models will assist in identifying potential impacts of groundwater withdrawal on surface waters and ecologic systems. This result will include an uncertainty analysis of the model to identify areas of inadequate data and will define flows needed to sustain ecological needs. These findings will inform decisions about additional monitoring and testing and development of decision making management scenarios and options.

Outcome**Completion Date**

- | | |
|-------------------------------------------------------------------------------------|-------------------|
| 1. Data compiled in Activity 1 incorporated in models and model scenarios developed | December 31, 2011 |
| 2. Models for the Bonanza Valley and the Buffalo Aquifer pilot studies created | December 31, 2012 |
| 3. Project report on models | June 30, 2013 |

Activity 3: Civic engagement, creation of plans and guidance development**Budget:** \$169,500

The involvement of local governments and stakeholders is essential for the success of this project and will be accomplished through the engagement of community groups, public meetings and web based information. Technical expert review and input will be included in plan and guidance development. Water management plans for each study area will be developed. Transferable guidance for the design and creation of locally supported water supply management will be developed. The guidance will be usable for large and small scale watershed management, consider surface and groundwater, incorporate ecologic and economic considerations and conserve, yet sustainably utilize, our water resources. Recommendations will be made for improved cooperative water management strategies.

Outcome**Completion Date**

- | | |
|---------------------------------------------------------------------------------|----------------|
| 1. A minimum of two community meetings held in each study area | June 30, 2013 |
| 2. Technical experts' review incorporated into plans and guidance | March 31, 2013 |
| 3. Web-based community communication established and maintained | June 30, 2013 |
| 4. Water supply management plans for each pilot study area written | June 30, 2013 |
| 5. Guidance on how to design and implement watershed management plans developed | June 30, 2013 |

III. PROJECT STRATEGY**A. Project Team/Partners**

Funded team/partners - DNR, project lead and data gathering; USGS, modeling (contract); Freshwater Society and Water Resources Center University of Minnesota (contract), plan and guidance development and civic engagement;

In-kind team/partners, DNR, USGS, City of Moorhead;

Other partners (not receiving funds) - Clay County Board of Commissioners, Pope County Commissioners, - local government leaders; Department of Health, Department of Agriculture and Pollution Control Agency - water quality assessments; Minnesota Rural Water Assoc., Buffalo-Red River Watershed District, Stearns County Environmental Services, Stearns County Soil and Water Conservation District and Pope County Land & Resources Management – local involvement.

B. Timeline Requirements

This project will be conducted over a period of two years with anticipated report completion by June 30, 2013. Actual implementation of management plans will continue after project completion. The duration and extent of this aspect will be one of the components of the management plans.

C. Long-Term Strategy

In addition to gathering new data and investigating the relation of aquitards with ground and surface water interaction, this project will develop guidance for sustainable water management on a watershed basis. This guidance has potential application to 81 major surface watersheds and uncounted groundwater-sheds and other surface watersheds. Future requests for LCCMR funding in these areas are not anticipated but may be necessary because of the complexity of the issues.

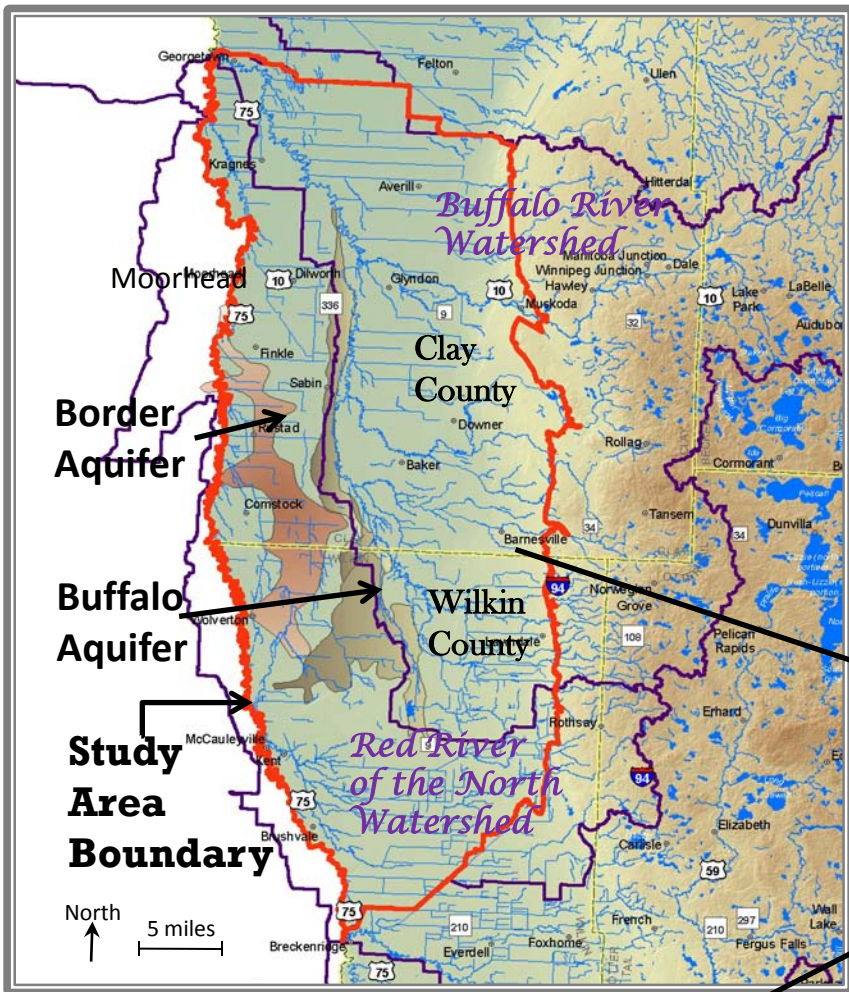
Project Budget

IV. TOTAL PROJECT REQUEST BUDGET (2 years)

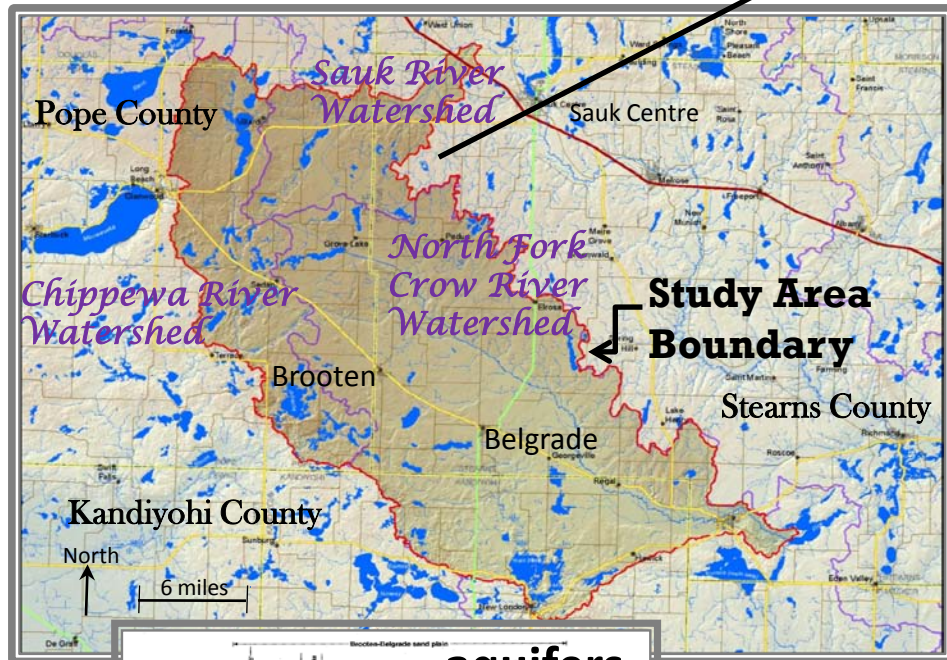
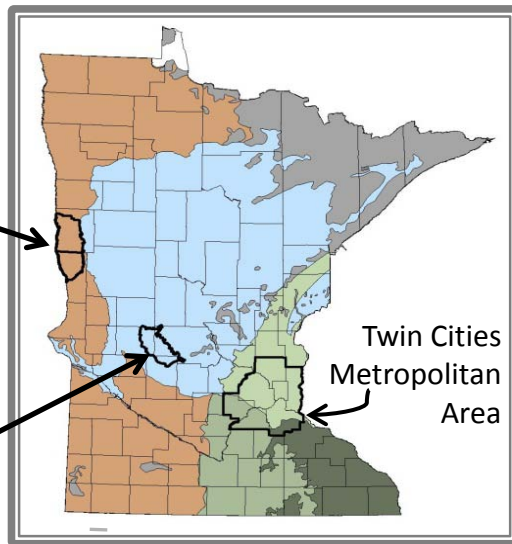
BUDGET ITEM	AMOUNT
Personnel:	
DNR Hydrologist 3, Project Manager (will be either unclassified or, if classified, backfilled with unclassified staff) - 1 FTE/year-July 2011 through June 2013 (salary+fringe)	\$ 184,000
DNR Hydrologist 1, data collection (will be either unclassified or, if classified, backfilled with unclassified hydrologist) - 1 FTE/yr - July 2011 through June 2013 (salary+fringe)	\$ 145,000
Contracts:	
United States Geological Survey: Hydrologist (Perry Jones) groundwater/surface water models for the Bonanza Valley and for the Buffalo Aquifer pilot study areas, calibration runs, scenario runs, uncertainty analyses, report - (salary+fringe and minor travel, field work and supplies. Does not include USGS "overhead" assessments that are indirectly related to the conduct of the project.)	\$ 254,000
Well driller TBD: well installation and documentation - 12 wells est. @ \$5,000/well and 12 @ \$3,000/well	\$ 96,000
The Freshwater Society and Water Resource Center University of Minnesota: workshops, community involvement, guidance development	\$ 30,000
Uof M, MDH, MDAgric. (existing interagency state contracts) geochemistry/age-dating - est. 12 wells/pilot area	\$ 25,000
Equipment/Tools/Supplies:	
Stream Gaging–data logger & pressure transducer, solar panel & regulator, protective enclosure, marine battery, raingage, telecommunications remote equipment, misc. hardware - est. 6 sites/pilot area @ \$12,000/site	\$ 144,000
Groundwater level monitoring-data loggers/pressure transducers/sensors 36 @ 750/well	\$ 27,000
Remote, real-time stations-surface gage + 2 wells - 3 sites Bonanza @\$15,000/site	\$ 45,000
Geochemical and age-dating - bottles, shipping, field supplies	\$ 1,000
Field laptop computer for specialized for data downloading	\$ 5,000
GIS computer specialized for map creation and data analysis	\$ 2,500
GPS receivers, protective safety and field gear, steel tapes and chalk	\$ 3,000
Travel: In-state - DNR travel for monitoring point installation, data collection, well installation, meeting attendance - Meals and lodging + mileage	\$ 25,000
TOTAL PROJECT BUDGET REQUEST TO LCCMR	\$ 986,500

V. OTHER FUNDS

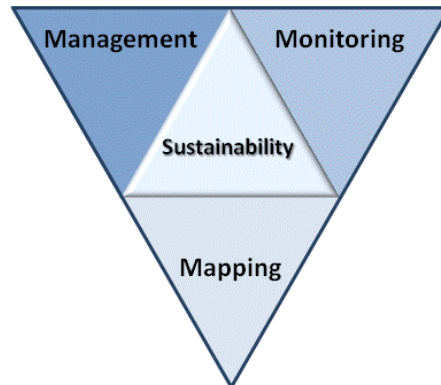
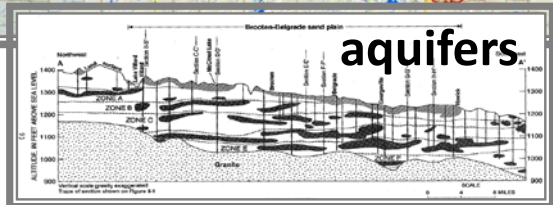
SOURCE OF FUNDS	AMOUNT	Status
In-kind Services During Project Period:		
DNR Area Hydrologists, local contacts - 1/8 FTE/year - July 2011 through June 2013	\$ 22,000	pending
DNR Hydrologist 3, modeler data prep - 1/8 FTE total - July 2011 through June 2013	\$ 15,000	pending
United States Geological Survey - 40% contribution toward models' development - federal contribution used to cover federal overhead costs as well as some direct project costs.	\$ 169,000	pending
City of Moorhead-monitoring levels and sampling, meetings, web development, scenario identification, plan development, public review and adoptions	\$ 65,600	secured
Minnesota DNR's In-kind Contribution: for shared services and governance	\$ 49,700	non-secured



Buffalo Aquifer Study Area



Bonanza Valley Study Area



LCCMR Proposal 2011

Title: New Generation in Water Supply Management – Pilot Studies

Project Manager Qualifications:

Laurel D. Reeves, P.G.

Professional Geologist License #30707

DNR Waters Hydrogeologist

Manager - Water Appropriation Permit program

Surface and ground water allocations

Water management planning

Water availability analyses

Manager - Ground Water Level Monitoring – 1990 to 2006

Plan, coordinate and manage ground water level data statewide

Plan, coordinate and manage an ongoing well and monitoring point maintenance, sealing and drilling program

Initiate studies, analyses and reports on water resource management issues

DNR Waters and MPCA hydrologist – 1981 to 1990

Water appropriation and protected waters permits and inventory

Solid waste and superfund permits and enforcement

Environmental review, public drainage project review, local water planning

Soil Exploration Co./Twin City Testing – geologist – 1970 - 1980

Publications:

Hydrogeologic Characterization of Six Sites in Southeastern Minnesota Using Borehole Flowmeters and Other Geophysical Logs, USGS Water-Resources Investigation Report 00-4142, 2000, co-authors

Minnesota's Water Supply: Natural Conditions and Human Impacts; 2000

Laurel D. Reeves & John Linc Stine, editors

Professional leadership:

President 2005 - Minnesota Ground Water Association.

Presentations:

Freeman Forum, LCCMR, LCMR, Minnesota Environmental Initiative, Citizens League, Minnesota Geological Survey, Univ. of Minn. WRC graduate seminar, American Institute of Hydrologists, American Water Works Assoc., Minn. Water Well Assoc., Minn. Ground Water Assoc., municipal water engineers, watershed districts, Ehler's Public Finance Seminar, Irrigator's Association, Minnesota Assoc. of Townships, Growing Greener Workshops, American Assoc. of Univ. Women, Minnesota Dept. of Health and U.S. Environmental Protection Agency managers, DNR Managers and staff.

Organization Description:

The Minnesota Department of Natural Resources (DNR)'s mission is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. The department consists of several divisions based on the state's natural resources, such as Fish and Wildlife, Forestry, Lands and Minerals, Parks and Trails, and Ecological Resources and Waters, as well as four regions and four support bureaus.

X. Environmental Spending Comparisons

“a comparison of the amounts spent by the state for environment and natural resources activities through the most recent fiscal year;”

The following document is from A Fiscal Review of the 2010 Legislative Session prepared by Minnesota State Senate Office of Senate Counsel, Research, and Fiscal Analysis.

A

Fiscal Review

of the

2010 Legislative Session

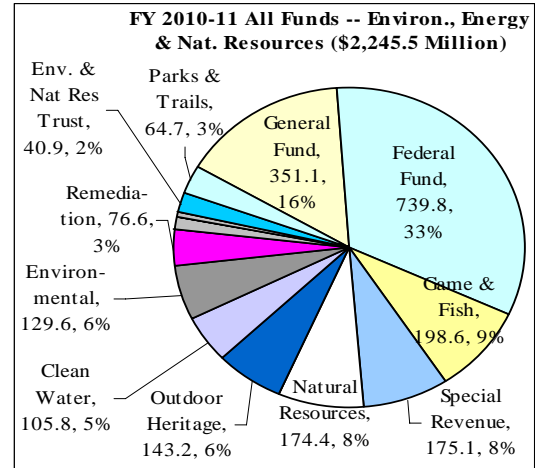
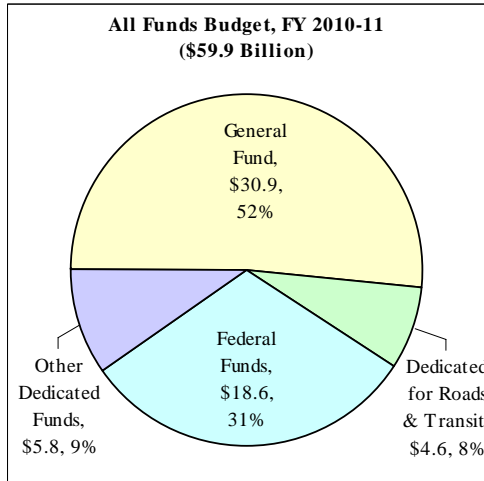
**Prepared by
Minnesota State Senate
Office of Senate Counsel, Research, and Fiscal Analysis
G-17 State Capitol
75 Rev. Dr. Martin Luther King, Jr. Blvd.
St. Paul, MN 55155-1606**

**Edited by
Matt Massman**

Table of Contents

REPORT PREFACE.....	1
STATE BUDGET SUMMARY.....	3
State Tax Revenues.....	13
Elementary and Secondary Education.....	22
Higher Education.....	30
Health and Human Services.....	34
Agriculture and Veterans Affairs.....	41
Environment, Energy, and Natural Resources.....	44
Economic Development and Housing.....	52
Public Safety.....	57
Judiciary.....	62
Transportation.....	66
State Government Finance.....	72
Tax Aids and Credits.....	78
Capital Investment.....	87
APPENDICES.....	93

ENVIRONMENT, ENERGY, AND NATURAL RESOURCES



Environment, Energy, and Natural Resources appropriations increase \$61 million; General Fund reduced.

The budget for Environment, Energy, and Natural Resource agencies and programs totals \$2.246 billion from all funds for FY 2010-2011, an increase of \$61.1 million relative to the February 2010 forecast. As captured in the legislative change column of Table 1, most appropriation increases occurred in the Environment and Natural Resources Trust Fund, which receives revenue from the Minnesota Lottery, and Outdoor Heritage Fund, which receives a portion of dedicated sales tax revenues. The increases reflect actions taken to appropriate the dedicated revenues for each of those funds for FY 2011. General Fund appropriations were reduced by \$17.0 million as part of the overall efforts to eliminate the General Fund deficit for FY 2010-2011.

Budget changes in 2010 were contained in a number of different bills:

- Chapter 215 – a General Fund budget balancing bill;
- Chapter 361 – the Environment and Energy Policy and Supplemental Funding Bill;
- Chapter 362 – the Legislative/Citizens Commission on MN Resources Bill; and
- First Special Session, Chapter 1 – the second General Fund budget balancing bill.

Chapter 390, which was the Omnibus Game and Fish Bill and Land Sales Bill also had some new spending and revenue initiatives, but was vetoed by the Governor.

Table 1
Biennial Spending by Agency & Fund--All Funds, FY 2010-11
(dollars in thousands)

	FY 2008-09 Spending	FY 2010-11 Adjusted Feb. Forecast	Legislative Changes	Current FY2010-11 Budget
Totals by Agency				
Pollution Control Agency	343,468	363,039	(5,877)	357,162
Minnesota Zoo	42,456	42,955	(462)	42,493
Department of Natural Resources	705,367	856,624	61,769	918,393
Metropolitan Council - Metro Parks	19,940	47,231	288	47,519
Minnesota Conservation Corps	1,980	1,890		1,890
Board of Water & Soil Resources	64,886	91,543	6,581	98,124
Science Museum of Minnesota	3,024	2,674		2,674
Legislative-Citizen Comm. MN Resources	1,512	1,254		1,254
Public Utilities Commission	14,185	17,055		17,055
Commerce Department	382,514	760,140	(1,200)	758,940
Total by Agency	1,579,332	2,184,405	61,099	2,245,504
Totals by Fund				
General Fund	442,930	368,096	(17,037)	351,059
General Fund Transfer Out	(4,550)			
Environmental Fund	130,360	129,071	535	129,606
Remediation Fund	78,144	76,593		76,593
Natural Resources Fund	165,214	173,629	760	174,389
Game & Fish Fund	188,997	198,208	395	198,603
Permanent School Fund	202	406		406
Petroleum Tank Release Cleanup Fund	21,297	32,554	(55)	32,499
Workers Compensation Special Fund	1,567	1,502		1,502
Special Revenue Fund	165,573	176,205	(1,100)	175,105
State Govt Special Revenue Fund	308	100		100
Gift Fund	10,841	11,185		11,185
Minnesota Future Resources Fund	131	131		131
Environment & Nat Res Trust Fund	33,776	23,424	17,454	40,878
Parks & Trails Fund		64,682		64,682
Outdoor Heritage Fund		84,827	58,339	143,166
Clean Water Fund		104,310	1,445	105,755
Federal Fund	344,542	739,482	363	739,845
Total by Fund	1,579,332	2,184,405	61,099	2,245,504

**General Fund
spending
reduced by
\$17 million.**

The net change for the Environment, Energy and Natural Resources General Fund budget was \$91.7 million, which included:

- \$17.0 million in appropriation reductions and cancellations, as summarized in Table 2;

Various fund transfers used to help balance General Fund.

- \$73.5 million in transfers from Nongeneral Funds into the General Fund; and
- \$1.2 million in increased General Fund revenues from various fee increases.

The Environment, Energy, and Natural Resources budget area makes up about 1.1 percent of the total General Fund budget. The \$17.0 million in spending reductions reflects a 4.6 percent reduction from the adjusted February forecast base budget for the FY 2010-2011 biennium of \$368.1 million for all of the agencies in this budget area. Table 2 summarizes the General Fund spending reductions enacted in 2010.

General Fund reductions were generally proportional across most program areas and agencies for which reductions were made. Selected programs administered by the Department of Natural Resources did not receive any reductions, including appropriations for forest firefighting, payment in lieu of taxes for public lands, and various treaty-related payments. In addition, three agencies funded by in this budget area also received no General Fund reductions, including the Science Museum, Minnesota Conservation Corps, and the Public Utilities Commission.

Table 2						
General Fund Spending Changes						
<i>(dollars in thousands)</i>						
	FY 2010	FY 2011	FY 2010-11	FY 2012	FY 2013	FY 2012-13
Forecasted Spending*	187,866	180,230	368,096	181,420	181,734	363,154
Pollution Control Agency (PCA)						
Water Resources	(364)	(971)	(1,335)	(930)	930)	(1,860)
Land		(30)	(30)	(30)	(30)	(60)
Environmental Assistance	(47)	(125)	(172)	(125)	(125)	(250)
Administrative Support	(60)	(128)	(188)	(128)	(128)	(256)
Subtotal, PCA Changes	(471)	(1,254)	(1,725)	(1,213)	(1,213)	(2,426)
Minnesota Zoo Reductions	(125)	(337)	(462)	(337)	(337)	(674)
Department of Natural Resources (DNR)						
Lands and Minerals	(198)	(418)	(616)	(364)	(364)	(728)
Water Management	(506)	(728)	(1,234)	(728)	(728)	(1,456)
Forest Management & Firefighting	(858)	(1,592)	(2,450)	(1,460)	(1,460)	(2,920)
Parks and Trails	(840)	(1,402)	(2,242)	(1,402)	(1,402)	(2,804)
Fish & Wildlife Management	(265)	(490)	(755)	(265)	(265)	(530)
Ecological Resources	(178)	(354)	(532)	(354)	(354)	(708)
Enforcement	(365)	(575)	(940)	(575)	(575)	(1,150)
Administration and Operations	(173)	(259)	(432)	(259)	(259)	(518)
Carryforward Cancellations	(335)		(335)			
Payments in Lieu of Taxes (Ch. 389)				122	122	244
Subtotal, DNR Changes	(3,718)	(5,818)	(9,536)	(5,285)	(5,285)	(10,570)
Metropolitan Council-Metro Parks	(86)	(326)	(412)	(240)	(240)	(480)
Board of Water & Soil Resources (BWSR)						
Operating Reductions	(102)	(230)	(332)	(230)	(230)	(460)
Grants to Local Governments	(489)	(1,133)	(1,622)	(1,133)	(1,133)	(2,266)
Carryforward Cancellations	(1,209)	(594)	(1,803)			
Subtotal, BWSR Changes	(1,800)	(1,957)	(3,757)	(1,363)	(1,363)	(2,726)
Commerce Department						
Administrative Services	(163)	(223)	(386)	(223)	(223)	(446)
Market Assurance	126	(308)	(182)	(346)	(346)	(692)
Office of Energy Security	(100)		(100)			
Carryforward Cancellations	(1,000)		(1,000)			
Mortgage Appraisal (Ch. 347)		523	523	377	388	765
Subtotal, Commerce Changes	(1,137)	(8)	(1,145)	(192)	(181)	(373)
Total Spending Changes	(7,337)	(9,700)	(17,037)	(8,630)	(8,619)	(17,249)
Total Spending	180,529	170,530	351,059	172,790	173,115	345,905

* Adjusted February 2010 state budget forecast (see Summary Chapter).

** Budget reductions are from Chapter 215 or Special Session Chapter 1, unless otherwise noted.

As summarized in Table 3, of the transfers from Nongeneral Funds, the largest transfer is \$48 million from the state's Closed Landfill Investment Fund. This fund was established in 2003 in order to set aside money for landfill cleanup costs starting in 2020. The \$48 million must be paid back to the fund, with interest, starting in fiscal year 2014. The other large transfer is \$14 million from the Workers Compensation Assigned Risk Plan, which is a fund established to help employers who

have been unable to secure coverage through the open market.

\$48 million transferred from Closed Landfill Investment Fund; funds to be repaid by 2018.

Table 3 General Fund Transfers & Revenue Changes <i>(dollars in thousands)</i>						
	<u>FY 2010</u>	<u>FY2011</u>	<u>FY2010-11</u>	<u>FY2012</u>	<u>FY2013</u>	<u>FY2012-13</u>
<u>Transfers from Other Funds</u>						
Pollution Control Agency						
Transfer from Closed Landfill Investment Fund		48,000	48,000			0
Transfer from Special Revenue Fund	328	462	790			0
Department of Natural Resources						
Transfer from Game & Fish Fund	900		900			0
Transfer from Special Revenue Fund	197	1,292	1,489	48	48	96
Board of Water & Soil Resources						
Transfer from Special Revenue Fund		310	310	310	310	620
Commerce Department						
Transfer from Petroleum Tank Release Fund	1,969	1,032	3,001			0
Transfer from Worker's Compensation Assigned Risk Plan		14,000	14,000			0
Transfer from Special Revenue Fund	3,024	1,993	5,017			0
Total Transfers-in	6,418	67,089	73,507	358	358	716
<u>Nontax Revenue Changes</u>						
Commerce Department						
Department Fees		489	489	89	89	178
Dept Health Plan Filings (Ch. 346)		50	50			0
Mortgage Appraisal (Ch. 347)		607	607	286	268	554
Department of Health Plan Filings		50	50			0
Total Nontax Revenues		1,196	1,196	375	357	732
Total Revenue Changes	6,418	68,285	74,703	733	715	1,448

* Revenues and transfers are from Chapter 215 or Special Session Chapter 1, unless otherwise noted.

While most agencies in this budget area saw a reduction in General Fund appropriations in both the 2009 and 2010 legislative sessions, agency spending is higher for most agencies when compared to the FY2008-2009 biennium. This is due mainly to an increase in funds from the federal economic stimulus package, as well as new appropriations from constitutionally dedicated funds (see tables 4 and 5).

Supplemental appropriations made from legacy funds.

Table 4			
Constitutional Dedicated Funding: by Fund, by Agency			
<i>(dollars in thousands)</i>			
Fund, Agency	2009 Session FY 2010-11	Legislative Changes	Current FY 2010-11 Budget
Outdoor Heritage Fund*			
<u>Department of Natural Resources</u>			
Prairie Acquisition & Restoration	14,213	18,093	32,306
Forests for the Future/Easements	36,000	5,603	41,603
Wetlands Acquisition & Restoration	11,478	10,010	21,488
Fish, Game & Wildlife Habitat	13,903	17,563	31,466
<u>Administration, Other</u>	<u>175</u>	<u>175</u>	<u>350</u>
Total for Department of Natural Resources	75,769	51,444	127,213
Wetlands Acquisition & Restoration	9,058	6,895	15,953
<u>Department of Agriculture</u>			
Forest Protection/Invasive Species	2,000		2,000
<u>Legislative Coordinating Commission</u>			
Administration, Web Site	705	600	1,305
Total Outdoor Heritage Fund	87,532	58,939	146,471
Clean Water Fund*			
<u>Pollution Control Agency</u>			
Nonpoint Source Protection & Preservation	3,250	200	3,450
Point Source Protection	4,669		4,669
Assessment, Monitoring & TMDL Development	34,492	600	35,092
Ground & Drinking Water Protection	7,250	5,000)	2,250
Education & Public Engagement	250		250
<u>Research & Tool Development</u>	<u>1,250</u>	<u>145</u>	<u>1,395</u>
Total for Pollution Control Agency	51,161	(4,055)	47,106
<u>Department of Natural Resources</u>			
Nonpoint Source Protection & Preservation	1,000		1,000
Assessment, Monitoring & TMDL Development	5,800		5,800
Ground & Drinking Water Protection	1,125	4,000	5,125
<u>Research & Tool Development</u>	<u>6,600</u>		<u>6,600</u>
Total for Department of Natural Resources	14,525	,000	18,525
<u>Metropolitan Council</u>			
Water Supply Planning	400	400	800
<u>Board of Water & Soil Resources</u>			
Nonpoint Source Protection & Preservation	36,224	800	37,024
<u>Wellhead Protection Areas</u>	<u>2,000</u>	<u>300</u>	<u>2,300</u>
Total for Board of Water & Soil Resources	38,224	1,100	39,324
<u>Department of Agriculture</u>			
AgBMP Loan Program	4,500		4,500
Assessment, Monitoring & TMDL Development	1,070		1,070
Ground & Drinking Water Protection	1,125		1,125
<u>Research & Tool Development</u>	<u>2,265</u>		<u>2,265</u>
Total for Department of Agriculture	8,960		8,960
<u>Public Facilities Authority</u>			
Wastewater and Point Source Grants & Loans	32,700		32,700
<u>Department of Health</u>			

Ground & Drinking Water Protection	3,750	3,750
<u>University of Minnesota</u>		
Research & Tool Development	1,055	1,055
<u>Legislative Coordinating Commission</u>		
Public Information Web Site	25	25
Total Clean Water Fund	150,800	152,245
Parks & Trails Fund*		
<u>Department of Natural Resources</u>		
State Parks, Recreation Areas, and Trails	27,781	27,781
Regional Parks and Trails Grants	7,770	7,770
Solar Project Grants	1,100	1,100
<u>Parks Framework & Inventory</u>	<u>250</u>	<u>250</u>
Total for Department of Natural Resources	36,901	36,901
<u>Metropolitan Council - Regional Parks</u>		
Metro Parks and Trails Grants	27,781	27,781
<u>University of Minnesota</u>		
Parks Framework & Inventory	400	400
<u>Legislative Coordinating Commission</u>		
Public Information Web Site	15	15
Total Parks & Trails Fund	65,097	65,097
Arts & Cultural Heritage Fund*		
<u>Arts Board</u>		
Arts & Arts Access Initiatives	33,550	33,550
Arts Education Collaborations	6,490	6,490
Arts in Cultural Heritage	2,160	2,160
<u>Fiscal Oversight & Accountability</u>	<u>1,100</u>	<u>1,100</u>
Total for Arts Board	43,300	43,300
<u>Historical Society</u>		
Statewide History Programs & Projects	7,750	7,750
Statewide Historic & Cultural Grants	6,750	6,750
Assistance to Local Historical Societies	5,000	5,000
<u>Exhibit on Regional, Local & Cultural Diversity</u>	<u>2,500</u>	<u>2,500</u>
Total for Historical Society	22,000	22,000
<u>Department of Administration: Fiscal Agent</u>		
Public Television	6,300	6,300
Minnesota Public Radio	2,650	2,650
Assoc. of MN Public Education Radio Stations	2,650	2,650
Minnesota Zoos	900	900
Minnesota Children's Museum	500	500
Duluth Children's Museum	500	500
<u>Science Museum of Minnesota</u>	<u>900</u>	<u>900</u>
Total for Dept. of Administration	14,400	14,400
<u>Minnesota Center for the Humanities</u>		
Program Development	600	600
Council on Asian Pacific Minnesotans	250	250
Council on Black Minnesotans	250	250
Indian Affairs Council	250	250
Chicano/Latino Affairs Council	250	250
<u>Civics Education</u>	<u>500</u>	<u>500</u>

Total for MN Center for the Humanities	2,100		2,100
<u>Perpich Center for Arts Education</u>			
Arts, Arts Education, and Arts Access	1,000		1,000
<u>Department of Education</u>			
Minnesota Regional Library Systems	8,500		8,500
<u>Indian Affairs Council</u>			
Dakota and Ojibwe Language Preservation	1,400		1,400
<u>Dakota and Ojibwe Immersion Programs</u>	<u>500</u>		<u>500</u>
Total for Indian Affairs Council	1,900		1,900
<u>Legislative Coordinating Commission</u>			
Public Information Web Site	20		20
Total Arts & Cultural Heritage Fund	93,220		93,220
Summary by Fund			
Outdoor Heritage Fund*	87,532	58,939	146,471
Clean Water Fund*	150,800	1,445	152,245
Parks & Trails Fund*	65,097		65,097
<u>Arts & Cultural Heritage Fund*</u>	<u>93,220</u>		<u>93,220</u>
Constitutional Dedicated Funds, Grand Total:	396,649	60,384	457,033
Note:* Funded with 3/8th percent increase in the sales tax			

Table 5	
Chapter 362: Legislative/Citizens Commission on Minnesota Resources Appropriations from the Environment & Natural Resources Trust Fund	
Category	Total Amount (see note)
Natural Resource Data and Information (11 projects)	\$4,920,000
Land, Habitat, and Recreation; including State Park Acquisitions and Rehabilitation (23 projects)	\$10,438,000
Water Resources (9 projects)	\$3,455,000
Aquatic and Terrestrial Invasive Species (4 projects)	\$1,470,000
Renewable Energy (5 projects funded, 1 line item veto)	\$3,221,000
Environmental Education (11 projects)	\$2,640,000
Overall Total:	\$26,144,000
Note: Total amount includes \$418,000 in FY2010 and \$25,479,000 in FY2011, and \$247,000 reallocated from previous years' appropriations.	

For questions regarding this Chapter or for more information on the fiscal aspects of Environment, Energy, and Natural Resources, please contact daniel.mueller@senate.mn

XI. Compliance Audit

*“a copy of the most recent
compliance audit.”*

The most recent compliance audit dated October 13, 2000 was included in the January 15, 2001 biennial report. The LCCMR has requested the legislative auditor to schedule a financial audit in the near future.

Appendix A

Funding Source Reference:

Environment and Natural Resources Trust Fund

MN Constitution – Amendment Article 11, Sec. 14
and M.S. 116P

Federal Land and Water Conservation Funds

(LAWCON) M.S. 116P.14

Oil Overcharge Money M.S. 4.071

Great Lakes Protection Account M.S. 116Q.02

Minnesota Constitution – Article XI, Section 14

Sec. 14. **ENVIRONMENT AND NATURAL RESOURCES FUND.** A permanent environment and natural resources trust fund is established in the state treasury. Loans may be made of up to five percent of the principal of the fund for water system improvements as provided by law. The assets of the fund shall be appropriated by law for the public purpose of protection, conservation, preservation, and enhancement of the state's air, water, land, fish, wildlife, and other natural resources. The amount appropriated each year of a biennium, commencing on July 1 in each odd-numbered year and ending on and including June 30 in the next odd-numbered year, may be up to 5-1/2 percent of the market value of the fund on June 30 one year before the start of the biennium. Not less than 40 percent of the net proceeds from any state-operated lottery must be credited to the fund until the year 2025. [Adopted, November 8, 1988; Amended, November 6, 1990; November 3, 1998]

Environmental Protection Funds

CHAPTER 116P

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

116P.01	FINDINGS.	116P.10	ROYALTIES, COPYRIGHTS, PATENTS, AND SALE OF PRODUCTS AND ASSETS.
116P.02	DEFINITIONS.	116P.11	AVAILABILITY OF FUNDS FOR DISBURSEMENT.
116P.03	TRUST FUND NOT TO SUPPLANT EXISTING FUNDING; APPROPRIATIONS.	116P.12	WATER SYSTEM IMPROVEMENT LOAN PROGRAM.
116P.04	TRUST FUND ACCOUNT.	116P.13	MINNESOTA FUTURE RESOURCES FUND.
116P.05	LEGISLATIVE-CITIZEN COMMISSION ON MINNESOTA RESOURCES.	116P.14	FEDERAL LAND AND WATER CONSERVATION FUNDS.
116P.06	INACTIVE.	116P.15	LAND ACQUISITION RESTRICTIONS.
116P.07	INFORMATION GATHERING.	116P.16	REAL PROPERTY INTEREST REPORT.
116P.08	TRUST FUND EXPENDITURES.	116P.17	ACQUISITION OF LANDS TO BE CONVEYED TO THE STATE; COMMISSIONER APPROVAL.
116P.09	ADMINISTRATION.		

116P.01 FINDINGS.

The legislature finds that all Minnesotans share the responsibility to ensure wise stewardship of the state's environment and natural resources for the benefit of current citizens and future generations. Proper management of the state's environment and natural resources includes and requires foresight, planning, and long-term activities that allow the state to preserve its high quality environment and provides for wise use of its natural resources. The legislature also finds that to undertake such activities properly, a long-term, consistent, and stable source of funding must be provided.

History: 1988 c 690 art 1 s 5

116P.02 DEFINITIONS.

Subdivision 1. **Applicability.** The definitions in this section apply to this chapter.

Subd. 2. [Repealed, 2006 c 243 s 22]

Subd. 3. **Board.** "Board" means the State Board of Investment.

Subd. 4. **Commission.** "Commission" means the Legislative-Citizen Commission on Minnesota Resources.

Subd. 5. **Natural resources.** "Natural resources" includes the outdoor recreation system under section 86A.04 and regional recreation open space systems as defined under section 473.351, subdivision 1.

Subd. 6. **Trust fund.** "Trust fund" means the Minnesota environment and natural resources trust fund established under Minnesota Constitution, article XI, section 14.

History: 1988 c 690 art 1 s 6; 1989 c 335 art 1 s 269; 2003 c 128 art 1 s 146; 2006 c 243 s 2

116P.03 TRUST FUND NOT TO SUPPLANT EXISTING FUNDING; APPROPRIATIONS.

(a) The trust fund may not be used as a substitute for traditional sources of funding environmental and natural resources activities, but the trust fund shall supplement the traditional sources, including those sources used to support the criteria in section 116P.08, subdivision 1.

The trust fund must be used primarily to support activities whose benefits become available only over an extended period of time.

(b) The commission must determine the amount of the state budget spent from traditional sources to fund environmental and natural resources activities before and after the trust fund is established and include a comparison of the amount in the report under section 116P.09, subdivision 7.

(c) For the fiscal year beginning July 1, 2007, and each year thereafter, the amount of the environment and natural resources trust fund that is available for appropriation under the terms of the Minnesota Constitution, article XI, section 14, shall be appropriated by law.

(d) The amount appropriated from the environment and natural resources trust fund may be spent only for the public purpose of protection, conservation, preservation, and enhancement of the state's air, water, land, fish, wildlife, and other natural resources. Recommendations made by the commission under this chapter must be consistent with the Minnesota Constitution, article XI, section 14; this chapter; and the strategic plan adopted under section 116P.08, subdivision 3, and must demonstrate a direct benefit to the state's environment and natural resources.

History: 1988 c 690 art 1 s 7; 2006 c 243 s 3

116P.04 TRUST FUND ACCOUNT.

Subdivision 1. **Establishment of account and investment.** A Minnesota environment and natural resources trust fund, under article XI, section 14, of the Minnesota Constitution, is established as an account in the state treasury. The commissioner of management and budget shall credit to the trust fund the amounts authorized under this section and section 116P.10. The State Board of Investment shall ensure that trust fund money is invested under section 11A.24. All money earned by the trust fund must be credited to the trust fund. The principal of the trust fund and any unexpended earnings must be invested and reinvested by the State Board of Investment.

Subd. 2. [Repealed, 1990 c 610 art 1 s 59]

Subd. 3. **Revenue.** Nothing in sections 116P.01 to 116P.12 limits the source of contributions to the trust fund.

Subd. 4. **Gifts and donations.** Gifts and donations, including land or interests in land, may be made to the trust fund. Noncash gifts and donations must be disposed of for cash as soon as the board prudently can maximize the value of the gift or donation. Gifts and donations of marketable securities may be held or be disposed of for cash at the option of the board. The cash receipts of gifts and donations of cash or capital assets and marketable securities disposed of for cash must be credited immediately to the principal of the trust fund. The value of marketable securities at the time the gift or donation is made must be credited to the principal of the trust fund and any earnings from the marketable securities are earnings of the trust fund.

Subd. 5. **Audits required.** The legislative auditor shall audit trust fund expenditures to ensure that the money is spent for the purposes for which the money was appropriated.

History: 1988 c 690 art 1 s 8; 1990 c 610 art 1 s 44; 1991 c 343 s 1; 2006 c 243 s 4; 2009 c 101 art 2 s 109

116P.05 LEGISLATIVE-CITIZEN COMMISSION ON MINNESOTA RESOURCES.

Subdivision 1. **Membership.** (a) A Legislative-Citizen Commission on Minnesota Resources of 17 members is created in the legislative branch, consisting of the chairs of the

house of representatives and senate committees on environment and natural resources finance or designees appointed for the terms of the chairs, four members of the senate appointed by the Subcommittee on Committees of the Committee on Rules and Administration, and four members of the house of representatives appointed by the speaker.

At least two members from the senate and two members from the house of representatives must be from the minority caucus. Members are entitled to reimbursement for per diem expenses plus travel expenses incurred in the services of the commission.

Seven citizens are members of the commission, five appointed by the governor, one appointed by the Senate Subcommittee on Committees of the Committee on Rules and Administration, and one appointed by the speaker of the house. The citizen members are selected and recommended to the appointing authorities according to subdivision 1a and must:

(1) have experience or expertise in the science, policy, or practice of the protection, conservation, preservation, and enhancement of the state's air, water, land, fish, wildlife, and other natural resources;

(2) have strong knowledge in the state's environment and natural resource issues around the state; and

(3) have demonstrated ability to work in a collaborative environment.

(b) Members shall develop procedures to elect a chair that rotates between legislative and citizen members. The chair shall preside and convene meetings as often as necessary to conduct duties prescribed by this chapter.

(c) Appointed legislative members shall serve on the commission for two-year terms, beginning in January of each odd-numbered year and continuing through the end of December of the next even-numbered year. Citizen and legislative members continue to serve until their successors are appointed.

(d) A citizen member may be removed by an appointing authority for cause. Vacancies occurring on the commission shall not affect the authority of the remaining members of the commission to carry out their duties, and vacancies shall be filled for the remainder of the term in the same manner under paragraph (a).

(e) Citizen members shall be initially appointed according to the following schedule of terms:

(1) two members appointed by the governor for a term ending the first Monday in January 2010;

(2) one member appointed by the senate Subcommittee on Committees of the Committee on Rules and Administration for a term ending the first Monday in January 2010 and one member appointed by the speaker of the house for a term ending the first Monday in January 2010;

(3) two members appointed by the governor for a term ending the first Monday in January 2009; and

(4) one member appointed by the governor for a term ending the first Monday in January 2008.

(f) Citizen members are entitled to per diem and reimbursement for expenses incurred in the services of the commission, as provided in section 15.059, subdivision 3.

(g) The governor's appointments are subject to the advice and consent of the senate.

Subd. 1a. **Citizen selection committee.** The governor shall appoint a Trust Fund Citizen Selection Committee of five members who come from different regions of the state and who have knowledge and experience of state environment and natural resource issues.

The duties of the Trust Fund Citizen Selection Committee shall be to:

- (1) identify citizen candidates to be members of the commission as part of the open appointments process under section 15.0597;
- (2) request and review citizen candidate applications to be members of the commission; and
- (3) interview the citizen candidates and recommend an adequate pool of candidates to be selected for commission membership by the governor, the senate, and the house of representatives.

Members are entitled to travel expenses incurred to fulfill their duties under this subdivision as provided in section 15.059, subdivision 6.

Subd. 2. **Duties.** (a) The commission shall recommend an annual or biennial legislative bill for appropriations from the environment and natural resources trust fund and shall adopt a strategic plan as provided in section 116P.08. Approval of the recommended legislative bill requires an affirmative vote of at least 12 members of the commission.

(b) The commission shall recommend expenditures to the legislature from the state land and water conservation account in the natural resources fund.

(c) It is a condition of acceptance of the appropriations made from the Minnesota environment and natural resources trust fund, and oil overcharge money under section 4.071, subdivision 2, that the agency or entity receiving the appropriation must submit a work program and semiannual progress reports in the form determined by the Legislative-Citizen Commission on Minnesota Resources, and comply with applicable reporting requirements under section 116P.16. None of the money provided may be spent unless the commission has approved the pertinent work program.

(d) The peer review panel created under section 116P.08 must also review, comment, and report to the commission on research proposals applying for an appropriation from the oil overcharge money under section 4.071, subdivision 2.

(e) The commission may adopt operating procedures to fulfill its duties under this chapter.

(f) As part of the operating procedures, the commission shall:

- (1) ensure that members' expectations are to participate in all meetings related to funding decision recommendations;
- (2) recommend adequate funding for increased citizen outreach and communications for trust fund expenditure planning;
- (3) allow administrative expenses as part of individual project expenditures based on need;
- (4) provide for project outcome evaluation;
- (5) keep the grant application, administration, and review process as simple as possible; and
- (6) define and emphasize the leveraging of additional sources of money that project proposers should consider when making trust fund proposals.

Subd. 3. **Sunset.** This section expires June 30, 2016, unless extended by law.

History: 1988 c 690 art 1 s 9; 1989 c 335 art 1 s 269; 1990 c 594 art 1 s 56; 1991 c 254 art 2 s 39; 1991 c 343 s 2; 1993 c 4 s 15; 1994 c 580 s 1; 1997 c 202 art 2 s 36; 2003 c 128 art 1 s 147; 1Sp2005 c 1 art 2 s 135; 2006 c 243 s 5; 2009 c 143 s 3

116P.06 [Repealed, 2006 c 243 s 22]

116P.07 INFORMATION GATHERING.

The commission may convene public forums or employ other methods to gather information for establishing priorities for funding.

History: 1988 c 690 art 1 s 11; 1991 c 254 art 2 s 41; 1991 c 343 s 4; 2002 c 225 s 2; 2006 c 243 s 6

116P.08 TRUST FUND EXPENDITURES.

Subdivision 1. **Expenditures.** Money in the trust fund may be spent only for:

- (1) the reinvest in Minnesota program as provided in section 84.95, subdivision 2;
- (2) research that contributes to increasing the effectiveness of protecting or managing the state's environment or natural resources;
- (3) collection and analysis of information that assists in developing the state's environmental and natural resources policies;
- (4) enhancement of public education, awareness, and understanding necessary for the protection, conservation, restoration, and enhancement of air, land, water, forests, fish, wildlife, and other natural resources;
- (5) capital projects for the preservation and protection of unique natural resources;
- (6) activities that preserve or enhance fish, wildlife, land, air, water, and other natural resources that otherwise may be substantially impaired or destroyed in any area of the state;
- (7) administrative and investment expenses incurred by the State Board of Investment in investing deposits to the trust fund; and
- (8) administrative expenses subject to the limits in section 116P.09.

Subd. 2. **Exceptions.** Money from the trust fund may not be spent for:

- (1) purposes of environmental compensation and liability under chapter 115B and response actions under chapter 115C;
- (2) purposes of municipal water pollution control under the authority of chapters 115 and 116;
- (3) costs associated with the decommissioning of nuclear power plants;
- (4) hazardous waste disposal facilities;
- (5) solid waste disposal facilities; or
- (6) projects or purposes inconsistent with the strategic plan.

Subd. 3. **Strategic plan required.** (a) The commission shall adopt a strategic plan for making expenditures from the trust fund, including identifying the priority areas for funding for the next six years. The strategic plan must be reviewed every two years. The strategic plan must have clearly stated short- and long-term goals and strategies for trust fund expenditures, must

provide measurable outcomes for expenditures, and must determine areas of emphasis for funding.

(b) The commission shall consider the long-term strategic plans of agencies with environment and natural resource programs and responsibilities and plans of conservation and environmental organizations during the development and review of the strategic plan.

Subd. 4. **Legislative recommendations.** (a) Funding may be provided only for those projects that meet the categories established in subdivision 1.

(b) The commission must recommend an annual or biennial legislative bill to make appropriations from the trust fund for the purposes provided in subdivision 1. The recommendations must be submitted to the governor for inclusion in the biennial budget and supplemental budget submitted to the legislature.

(c) The commission may recommend regional block grants for a portion of trust fund expenditures to partner with existing regional organizations that have strong citizen involvement, to address unique local needs and capacity, and to leverage all available funding sources for projects.

(d) The commission may recommend the establishment of an emerging issues account in its legislative bill for funding emerging issues, which come up unexpectedly, but which still adhere to the commission's strategic plan, to be approved by the governor after initiation and recommendation by the commission.

(e) Money in the trust fund may not be spent except under an appropriation by law.

Subd. 5. **Public meetings.** (a) Meetings of the commission, committees or subcommittees of the commission, technical advisory committees, and peer review panels must be open to the public. The commission shall attempt to meet throughout various regions of the state during each biennium. For purposes of this subdivision, a meeting occurs when a quorum is present and action is taken regarding a matter within the jurisdiction of the commission, a committee or subcommittee of the commission, a technical advisory committee, or a peer review panel.

(b) For legislative members of the commission, enforcement of this subdivision is governed by section 3.055, subdivision 2. For nonlegislative members of the commission, enforcement of this subdivision is governed by section 13D.06, subdivisions 1 and 2.

Subd. 6. **Peer review.** (a) Research proposals must include a stated purpose directly connected to the trust fund's constitutional mandate, this chapter, and the adopted strategic plan under subdivision 3, a timeline, potential outcomes, and an explanation of the need for the research. All research proposals must be reviewed by a peer review panel before receiving an appropriation.

(b) In conducting research proposal reviews, the peer review panel shall:

(1) comment on the methodology proposed and whether it can be expected to yield appropriate and useful information and data;

(2) comment on the need for the research and about similar existing information available, if any; and

(3) report to the commission on clauses (1) and (2).

(c) The peer review panel also must review completed research proposals that have received an appropriation and comment and report upon whether the project reached the intended goals.

Subd. 7. **Peer review panel membership.** (a) The peer review panel must consist of at least

five members who are knowledgeable in general research methods in the areas of environment and natural resources. Not more than two members of the panel may be employees of state agencies in Minnesota.

(b) The commission shall select a chair every two years who shall be responsible for convening meetings of the panel as often as is necessary to fulfill its duties as prescribed in this section. Compensation of panel members is governed by section 15.059, subdivision 3.

History: 1988 c 690 art 1 s 12; 1989 c 335 art 1 s 178; 1991 c 254 art 2 s 42,43; 1991 c 343 s 5,6; 1994 c 580 s 2,3; 2001 c 7 s 31; 2004 c 284 art 2 s 14; 2006 c 243 s 7-10; 2007 c 30 s 3; 2009 c 143 s 4

116P.09 ADMINISTRATION.

Subdivision 1. **Administrative authority.** The commission may appoint legal and other personnel and consultants necessary to carry out functions and duties of the commission. Permanent employees shall be in the unclassified service. In addition, the commission may request staff assistance and data from any other agency of state government as needed for the execution of the responsibilities of the commission and an agency must promptly furnish it.

Subd. 2. **Liaison officers.** The commission shall request each department or agency head of all state agencies with a direct interest and responsibility in any phase of environment and natural resources to appoint, and the latter shall appoint for the agency, a liaison officer who shall work closely with the commission and its staff.

Subd. 3. **Appraisal and evaluation.** The commission shall obtain and appraise information available through private organizations and groups, utilizing to the fullest extent possible studies, data, and reports previously prepared or currently in progress by public agencies, private organizations, groups, and others, concerning future trends in the protection, conservation, preservation, and enhancement of the state's air, water, land, forests, fish, wildlife, native vegetation, and other natural resources. Any data compiled by the commission shall be made available to any standing or interim committee of the legislature upon the request of the chair of the respective committee.

Subd. 4. **Personnel.** Persons who are employed by a state agency to work on a project and are paid by an appropriation from the trust fund are in the unclassified civil service, and their continued employment is contingent upon the availability of money from the appropriation. When the appropriation has been spent, their positions must be canceled and the approved complement of the agency reduced accordingly. Part-time employment of persons for a project is authorized. The use of classified employees is authorized when approved as part of the work program required by section 116P.05, subdivision 2, paragraph (c).

Subd. 5. **Administrative expense.** The prorated expenses related to commission administration of the trust fund may not exceed an amount equal to four percent of the amount available for appropriation of the trust fund for the biennium.

Subd. 6. **Conflict of interest.** A commission member, a technical advisory committee member, a peer review panelist, or an employee of the commission may not participate in or vote on a decision of the commission, advisory committee, or peer review panel relating to an organization in which the member, panelist, or employee has either a direct or indirect personal financial interest. While serving on the commission, technical advisory committee, or peer review panel, or being an employee of the commission, a person shall avoid any potential conflict of

interest.

Subd. 7. **Report required.** The commission shall, by January 15 of each odd-numbered year, submit a report to the governor, the chairs of the house of representatives appropriations and senate finance committees, and the chairs of the house of representatives and senate committees on environment and natural resources. Copies of the report must be available to the public. The report must include:

- (1) a copy of the current strategic plan;
- (2) a description of each project receiving money from the trust fund during the preceding biennium;
- (3) a summary of any research project completed in the preceding biennium;
- (4) recommendations to implement successful projects and programs into a state agency's standard operations;
- (5) to the extent known by the commission, descriptions of the projects anticipated to be supported by the trust fund during the next biennium;
- (6) the source and amount of all revenues collected and distributed by the commission, including all administrative and other expenses;
- (7) a description of the assets and liabilities of the trust fund;
- (8) any findings or recommendations that are deemed proper to assist the legislature in formulating legislation;
- (9) a list of all gifts and donations with a value over \$1,000;
- (10) a comparison of the amounts spent by the state for environment and natural resources activities through the most recent fiscal year; and
- (11) a copy of the most recent compliance audit.

Subd. 8. **Technical advisory committees.** The commission shall make use of available public and private expertise on environment and natural resource issues by appointing necessary technical advisory committees to review funding proposals and evaluate project outcomes. Compensation for technical advisory committee members is governed by section 15.059, subdivision 6.

History: 1988 c 690 art 1 s 13; 1991 c 254 art 2 s 44-46; 1991 c 343 s 7-10; 1994 c 580 s 4; 2003 c 128 art 1 s 148-150; 2006 c 243 s 11-13

116P.10 ROYALTIES, COPYRIGHTS, PATENTS, AND SALE OF PRODUCTS AND ASSETS.

(a) This section applies to projects supported by the trust fund and the oil overcharge money referred to in section 4.071, subdivision 2, each of which is referred to in this section as a "fund."

(b) The fund owns and shall take title to the percentage of a royalty, copyright, or patent resulting from a project supported by the fund equal to the percentage of the project's total funding provided by the fund. Cash receipts resulting from a royalty, copyright, or patent, or the sale of the fund's rights to a royalty, copyright, or patent, must be credited immediately to the principal of the fund. Receipts from Minnesota future resources fund projects must be credited to the trust fund. The commission may include in its legislative bill a recommendation to relinquish the ownership or rights to a royalty, copyright, or patent resulting from a project supported by

the fund to the project's proposer when the amount of the original grant or loan, plus interest, has been repaid to the fund.

(c) If a project supported by the fund results in net income from the sale of products or assets developed or acquired by an appropriation from the fund, the appropriation must be repaid to the fund in an amount equal to the percentage of the project's total funding provided by the fund. The commission may include in its legislative bill a recommendation to relinquish the income if a plan is approved for reinvestment of the income in the project or when the amount of the original grant or loan, plus interest, has been repaid to the fund.

History: 1988 c 690 art 1 s 14; 1993 c 172 s 79; 2003 c 128 art 1 s 151; 2008 c 367 s 3; 2009 c 143 s 5

116P.11 AVAILABILITY OF FUNDS FOR DISBURSEMENT.

(a) The amount annually available from the trust fund for the legislative bill developed by the commission is as defined in the Minnesota Constitution, article XI, section 14.

(b) Any appropriated funds not encumbered in the biennium in which they are appropriated cancel and must be credited to the principal of the trust fund.

History: 1988 c 690 art 1 s 15; 1990 c 594 art 1 s 57; 1990 c 612 s 14; 1992 c 513 art 2 s 27; 1992 c 539 s 10; 1993 c 300 s 10; 1994 c 580 s 5; 1995 c 220 s 111; 2002 c 225 s 3; 2006 c 243 s 14

116P.12 WATER SYSTEM IMPROVEMENT LOAN PROGRAM.

Subdivision 1. **Loans authorized.** (a) If the principal of the trust fund equals or exceeds \$200,000,000, the commission may vote to set aside up to five percent of the principal of the trust fund for water system improvement loans. The purpose of water system improvement loans is to offer below market rate interest loans to local units of government for the purposes of water system improvements.

(b) The interest on a loan shall be calculated on the declining balance at a rate four percentage points below the secondary market yield of one-year United States Treasury bills calculated according to section 549.09, subdivision 1, paragraph (c).

(c) An eligible project must prove that existing federal or state loans or grants have not been adequate.

(d) Payments on the principal and interest of loans under this section must be credited to the trust fund.

(e) Repayment of loans made under this section must be completed within 20 years.

(f) The Minnesota Public Facilities Authority must report to the commission each year on the loan program under this section.

Subd. 2. **Application and administration.** (a) The commission must adopt a procedure for the issuance of the water system improvement loans by the Public Facilities Authority.

(b) The commission also must ensure that the loans are administered according to its fiduciary standards and requirements.

History: 1988 c 690 art 1 s 16

116P.13 MINNESOTA FUTURE RESOURCES FUND.

Subdivision 1. **Revenue sources.** The money in the Minnesota future resources fund consists of revenue credited under section 297F.10, subdivision 1, paragraph (b), clause (1).

Subd. 2. **Interest.** The interest attributable to the investment of the Minnesota future resources fund must be credited to the fund.

Subd. 3. **Revenue purposes.** Revenue in the Minnesota future resources fund may be spent for purposes of natural resources acceleration and outdoor recreation, including but not limited to the development, maintenance, and operation of the state outdoor recreation system under chapter 86A and regional recreation open space systems as defined under section 473.351, subdivision 1.

History: 1988 c 690 art 1 s 17; 1989 c 335 art 1 s 179; 1997 c 106 art 2 s 4

116P.14 FEDERAL LAND AND WATER CONSERVATION FUNDS.

Subdivision 1. **Designated agency.** The Department of Natural Resources is designated as the state agency to apply for, accept, receive, and disburse federal reimbursement funds and private funds, which are granted to the state of Minnesota from section 6 of the federal Land and Water Conservation Fund Act.

Subd. 2. **State land and water conservation account; creation.** A state land and water conservation account is created in the natural resources fund. All of the money made available to the state from funds granted under subdivision 1 shall be deposited in the state land and water conservation account.

Subd. 3. **Local share.** Fifty percent of all money made available to the state from funds granted under subdivision 1 shall be distributed for projects to be acquired, developed, and maintained by local units of government, providing that any project approved is consistent with a statewide or a county or regional recreational plan and compatible with the statewide recreational plan. All money received by the commissioner for local units of government is appropriated annually to carry out the purposes for which the funds are received.

Subd. 4. **State share.** Fifty percent of the money made available to the state from funds granted under subdivision 1 shall be used for state land acquisition and development for the state outdoor recreation system under chapter 86A and the administrative expenses necessary to maintain eligibility for the federal land and water conservation fund.

History: 1Sp2001 c 2 s 140; 2003 c 128 art 1 s 152,153

116P.15 LAND ACQUISITION RESTRICTIONS.

Subdivision 1. **Scope.** A recipient of an appropriation from the trust fund or the Minnesota future resources fund who acquires an interest in real property with the appropriation must comply with this section. If the recipient fails to comply with the terms of this section, ownership of the interest in real property transfers to the state. For the purposes of this section, "interest in real property" includes, but is not limited to, an easement or fee title to property.

Subd. 2. **Restrictions; modification procedure.** (a) An interest in real property acquired with an appropriation from the trust fund or the Minnesota future resources fund must be used in perpetuity or for the specific term of an easement interest for the purpose for which the appropriation was made.

(b) A recipient of funding who acquires an interest in real property subject to this section may not alter the intended use of the interest in real property or convey any interest in the real property acquired with the appropriation without the prior review and approval of the commission. The commission shall establish procedures to review requests from recipients to alter the use of or convey an interest in real property. These procedures shall allow for the replacement of the interest in real property with another interest in real property meeting the following criteria:

(1) the interest is at least equal in fair market value, as certified by the commissioner of natural resources, to the interest being replaced; and

(2) the interest is in a reasonably equivalent location, and has a reasonably equivalent usefulness compared to the interest being replaced.

(c) A recipient of funding who acquires an interest in real property under paragraph (a) must separately record a notice of funding restrictions in the appropriate local government office where the conveyance of the interest in real property is filed. The notice of funding agreement must contain:

(1) a legal description of the interest in real property covered by the funding agreement;

(2) a reference to the underlying funding agreement;

(3) a reference to this section; and

(4) the following statement:

"This interest in real property shall be administered in accordance with the terms, conditions, and purposes of the grant agreement or work program controlling the acquisition of the property. The interest in real property, or any portion of the interest in real property, shall not be sold, transferred, pledged, or otherwise disposed of or further encumbered without obtaining the prior written approval of the Legislative-Citizen Commission on Minnesota Resources or its successor. If the holder of the interest in real property fails to comply with the terms and conditions of the grant agreement or work program, ownership of the interest in real property shall transfer to this state."

History: *1Sp2001 c 2 s 141; 2002 c 225 s 4; 2006 c 243 s 21*

116P.16 REAL PROPERTY INTEREST REPORT.

By December 1 each year, a recipient of an appropriation from the trust fund, that is used for the acquisition of an interest in real property, must submit annual reports on the status of the real property to the Legislative-Citizen Commission on Minnesota Resources in a form determined by the commission. The responsibility for reporting under this section may be transferred by the recipient of the appropriation to another person who holds the interest in the real property. To complete the transfer of reporting responsibility, the recipient of the appropriation must:

(1) inform the person to whom the responsibility is transferred of that person's reporting responsibility;

(2) inform the person to whom the responsibility is transferred of the property restrictions under section 116P.15; and

(3) provide written notice to the commission of the transfer of reporting responsibility, including contact information for the person to whom the responsibility is transferred.

After the transfer, the person who holds the interest in the real property is responsible for reporting requirements under this section.

History: *1Sp2005 c 1 art 2 s 136; 2006 c 243 s 21*

**116P.17 ACQUISITION OF LANDS TO BE CONVEYED TO THE STATE;
COMMISSIONER APPROVAL.**

(a) A recipient of an appropriation from the trust fund who acquires an interest in real property must receive written approval from the commissioner of natural resources prior to the acquisition, if the interest:

- (1) is acquired in whole or in part with the appropriation; and
- (2) will be conveyed to the state for management by the commissioner.

(b) The commissioner shall approve acquisitions under this section only when the interest in real property:

- (1) is identified as a high priority by the commissioner; or
- (2) meets the objectives and criteria identified in the applicable acquisition plan for the intended management status of the property.

History: *2010 c 362 s 3*

116P.14 FEDERAL LAND AND WATER CONSERVATION FUNDS.

Subdivision 1. **Designated agency.** The Department of Natural Resources is designated as the state agency to apply for, accept, receive, and disburse federal reimbursement funds and private funds, which are granted to the state of Minnesota from section 6 of the federal Land and Water Conservation Fund Act.

Subd. 2. **State land and water conservation account; creation.** A state land and water conservation account is created in the natural resources fund. All of the money made available to the state from funds granted under subdivision 1 shall be deposited in the state land and water conservation account.

Subd. 3. **Local share.** Fifty percent of all money made available to the state from funds granted under subdivision 1 shall be distributed for projects to be acquired, developed, and maintained by local units of government, providing that any project approved is consistent with a statewide or a county or regional recreational plan and compatible with the statewide recreational plan. All money received by the commissioner for local units of government is appropriated annually to carry out the purposes for which the funds are received.

Subd. 4. **State share.** Fifty percent of the money made available to the state from funds granted under subdivision 1 shall be used for state land acquisition and development for the state outdoor recreation system under chapter 86A and the administrative expenses necessary to maintain eligibility for the federal land and water conservation fund.

History: *1Sp2001 c 2 s 140; 2003 c 128 art 1 s 152,153*

4.071 OIL OVERCHARGE MONEY.

Subdivision 1. **Appropriation required.** "Oil overcharge money" means money received by the state as a result of litigation or settlements of alleged violations of federal petroleum pricing regulations. Oil overcharge money may not be spent until it is specifically appropriated by law.

Subd. 2. **Minnesota resources projects.** The legislature intends to appropriate one-half of the oil overcharge money for projects that have been reviewed and recommended by the Legislative-Citizen Commission on Minnesota Resources. A work plan must be prepared for each proposed project for review by the commission. The commission must recommend specific projects to the legislature.

Subd. 3. [Repealed, 1998 c 273 s 15]

History: 1988 c 686 art 1 s 36; 1988 c 690 s 1; 1989 c 335 art 1 s 269; 1990 c 568 art 2 s 1; 1994 c 483 s 1; 2006 c 243 s 21

116Q.02 STATE RECEIPTS FROM THE FUND.

Subdivision 1. **Great Lakes protection account.** Any money received by the state from the Great Lakes protection fund, whether in the form of annual earnings or otherwise, must be deposited in the state treasury and credited to a special Great Lakes protection account. Money in the account must be spent only as specifically appropriated by law for protecting water quality in the Great Lakes. Approved purposes include, but are not limited to, supplementing in a stable and predictable manner state and federal commitments to Great Lakes water quality programs by providing grants to finance projects that advance the goals of the regional Great Lakes toxic substances control agreement and the binational Great Lakes water quality agreement.

Subd. 2. **LCCMR review.** The legislature intends not to appropriate money from the Great Lakes protection account until projects have been reviewed and recommended by the Legislative-Citizen Commission on Minnesota Resources. A work plan must be prepared for each project for review by the commission. The commission must recommend specific projects to the legislature.

History: 1990 c 594 art 1 s 59; 2006 c 243 s 21

