Susan Thornton
LCCMR, Director
http://www.lccmr.leg.mn

RFP Funding Priorities and Selection Criteria, 2008-2010

2010 RFP Funding Priorities

Targeted Issue Areas

Projects were sought that provide multiple ecological and other public benefits and are consistent with the LCCMR Six-Year Strategic Plan and the Statewide Conservation and Preservation Plan.

Proposals were requested in the following seven areas:
A. Water Resources
B. Renewable Energy Related to Climate Change
C. Habitat Restoration, Enhancement, and Acquisition
D. Invasive Species
E. Natural Resource Conservation Planning and Implementation
F. Environmental Education
G. 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 reduce 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 protect, restore, and enhance 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 invasibility (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 are 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 result in increased community involvement and leadership on environmental issues. Preference was given toward efforts that develop understanding of climate change or that involve outdoor classroom settings.

G. Creative Ideas
Projects were 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.

LCCMR's 2010 Environment and Natural Resources Trust Fund Allocation Recommendations to the 2010 Minnesota Legislature

In response to the 2010 proposal process, 240 proposals requesting a total of approximately $163.8 million were received. Approximately $26 million is available for 2010 funding from the Environment and Natural Resources Trust Fund. After full consideration of all proposals received, on 10/14/09 the Legislative-Citizen Commission on Minnesota Resources (LCCMR) made final allocation recommendations for 48 projects. These recommendations ranged from full funding for the full project and dollar amount requested to partial funding for specific project elements and partial dollar amounts requested. Project managers of proposals recommeneded for funding will be contacted individually rearding the parameters of their project's allocation recommendation.

Funding Priority Category	$ Recommended ($26,029,000)	Percentage of Total Recommendation
A. Water Resources (11 Appropriations)	$5,685,000	21.84%
B. Renewable Energy Related to Climate Change (5 Appropriations)	$3,364,000	12.92%
C. Habitat Restoration, Enhancement, and Acquisition (8 Appropriations)	$10,180,000	39.11%
D. Invasive Species (4 Appropriations)	$1,470,000	5.65%
E. Natural Resource conservation Planning and Implementation (4 Appropriati	$950,000	3.65%
F. Environmental Education (11 Appropriations)	$2,640,000	10.14%
G. Creative Ideas (5 Appropriations)	$1,740,000	6.68%
TOTAL $ RECOMMENDATION	**$26,029,000**	

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	Project #	Project Title	Organization	Project Manager	$ Recommended ($26,029,000)	Region of Impact
1	**A. Water Resources (11 projects/subtotal = $5,685,000)**					
2	003-A1	MGS County Geologic Atlases and Related Hydrogeologic Research	MN Geological Survey	Setterholm, Dale	$1,130,000	Statewide
3	009-A2	Dioxins Derived from Antibacterials in Minnesota Lakes	U of MN	Arnold, William	$264,000	Statewide
4	010-A2	Estrogenic and Pharmaceutical Septic System Discharge to Lakes	U.S. Geological Survey	Kiesling, Richard	$594,000	Statewide
5	011-A2	Fate and Ecological Impacts of Industrial Phytoestrogens	U of MN	Novak, Paige	$340,000	Statewide
6	012-A2	Understanding Sources of Aquatic Contaminants of Emerging Concern	U of MN	Swackhamer, Deborah	$640,000	Statewide
7	019-A3	Updating the Minnesota Wetlands Inventory: Phase 2	DNR	Kloiber, Steve	$1,100,000	Metro, NE, SE
8	020-A3	Sustainable, Cost-Effective Approaches to Management of Shallow Lakes	DNR	Hanson, Mark	$262,000	Statewide
9	024-A3	Assessing the Cumulative Impacts to Near-Shore, In-Water Habitat	U of MN	Vondracek, Bruce	$300,000	Statewide
10	026-A3	Predicting and Mitigating Vulnerability of Trout Streams	U of MN	Ferrington, Leonard	$300,000	SE
11	028-A3	Mineland Sulfate Release in Saint Louis River Basin	DNR	Berndt, Michael	$270,000	NE
12	035-A3	Mapleton Area Agricultural/Urban Runoff Water Quality Treatment Analysis	Blue Earth County Drainage Authority	Austinson, Craig	$485,000	SE
13				**Water Resources Subtotal =**	**$5,685,000**	
14	**B. Renewable Energy Related to Climate Change (5 projects/subtotal = $3,364,000)**					
15	048-B1	Sustainable Biofuels: Impacts of Climate Change and Management	U of MN	Tilman, David	$221,000	Central, Metro, NW, SW
16	064-B2	Linking Habitat Restoration to Bioenergy and Local Economies	DNR	Spears, Barb	$600,000	Central, Metro, SE
17	074-B3	Algae for Fuels Pilot Project	U of MN	Ruan, Roger	$900,000	Statewide

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18	075-B3	Residential Environmental Learning Centers (RELCs) Sustainable Energy Project	The MN Coalition of RELCs	Deden, Joe	$1,500,000	Statewide
19	240-B1	Life Cycle Analysis of Options for Minnesota's Energy Needs	U of MN	Pollak, Melisa	$143,000	Statewide
20				**Renewable Energy Related to Climate Change Subtotal =**	**$3,364,000**	
21	**C. Habitat Restoration, Enhancement, and Acquisition (8 projects/subtotal = $10,180,000)**					
22	082-C	Ecological Restoration Training Cooperative	U of MN	Galatowitsch, Susan	$550,000	Statewide
23	087-C	SNA & Native Prairie Restoration, Enhancement & Acquisition	DNR	Booth, Margaret (Peggy)	$1,750,000	Statewide
24	090-C	State Parks and Trails Land Acquisition	DNR	Peterson, Larry Linnell, Stan	$2,200,000	Statewide
25	092-C	Reconnecting Minnesotas Fragmented Prairie Landscapes	The Nature Conservancy	Chaplin, Steve	$380,000	Central, Metro, SE, SW
26	095-C	Protection of Granite Rock Outcrop Ecosystem	Renville SWCD	Kalahar, Thomas	$1,800,000	Central, SW
27	097-C	Conserving Sensitive and Priority Shorelands in Cass County	Cass County Environmental Services Department	Sumption, John	$300,000	Central
28	101-C	Minnesotas Habitat Conservation Partnership	Pheasants Forever (on behalf of all partners)	Holland, Matt	$1,400,000	Statewide
29	102-C	Metropolitan Conservation Corridors Phase 5 Supplemental	DNR	Sames, Wayne	$1,800,000	Central, Metro, SE
30				**Habitat Protection and Restoration Subtotal =**	**$10,180,000**	
31	**D. Invasive Species (4 projects/subtotal = $1,470,000)**					
32	111-D	Biological Control of European Buckthorn and Garlic Mustard	DNR	Skinner, Luke	$300,000	Statewide
33	112-D	Healthy Forests to Resist Invasion	U of MN	Reich, Peter	$359,000	Central, Metro, NE, SE
34	113-D	Bioacoustic Traps for Management of the Round Goby	U of MN - Duluth	Mensinger, Allen	$175,000	Statewide

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35	239-D	Ecological and Hydrological Impacts of Emerald Ash Borer	U of MN	D'Amato, Anthony	$636,000	Statewide
36				**Invasive Species Subtotal =**	**$1,470,000**	
37	**E. Natural Resource Conservation Planning and Implementation (4 projects/subtotal = $950,000)**					
38	133-E1	"Green Acres" and Farmland Conservation in Minnesota	Farmers Legal Action Group, Inc. (FLAG)	Stokes, Susan E.	$100,000	Statewide
39	142-E2	Strategic Planning for Minnesota's Natural and Artificial Watersheds	U of MN	Mulla, David	$327,000	Statewide
40	143-E2	The Minnesota Breeding Bird Atlas	Audubon Minnesota	Martell, Mark	$372,000	Statewide
41	145-E2	An Integrated, Operational Bird Conservation Plan for Minnesota	Audubon Minnesota	Pfannmuller, Lee	$151,000	Statewide
42				**NR Conservation Planning & Implementation Subtotal =**	**$950,000**	
43	**F. Environmental Education (11 projects/subtotal = $2,640,000)**					
44	165-F	Urban Wilderness Canoe Adventures (UWCA)	Wilderness Inquiry	Lais, Greg	$557,000	Metro
45	166-F	Minnesota Conservation Apprenticeship Academy	Board of Water and Soil Resources	Woods, Steve	$368,000	Statewide
46	171-F	Minnesota's Changing Climate: Engaging Students through Adventure Learning	Will Steger Foundation	Rom, Nicole	$250,000	Statewide
47	176-F	Digital Photography Bridge to Nature, Teacher Training	DNR	Henderson, Carrol	$160,000	Statewide
48	179-F	Get Outside! Urban Woodland for City Kids	City of Saint Paul, Dept of Parks and Recreation	Ganje, Don	$218,000	Metro
49	180-F	Expanding and Strengthening Outdoor Classrooms at Minnesota Schools	DNR	Duffey, Laura	$300,000	Central, Metro, NE, SW, SE
50	185-F	Fishing: A Cross Cultural Gateway to Environmental Education	Association for the Advancement of Hmong Women in MN	Vang, Ly	$155,000	Metro
51	186-F	Minnesota WolfLink	International Wolf Center	Ortiz, Mary	$193,000	NE

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52	190-F	Innovative Model for Environmental and Outdoor Education in Grades 7-12	DNR	Bylander, C.B.	$300,000	Statewide
53	194-F	Minnesota River Experts: An educational field trip online	MN State University - Mankato	Musser, Kimberly	$124,000	Central, Metro, SE, SW
54	200-F	Project Get Outdoors Toolkit Activities	Project Get Outdoors, Inc.	Grover, Sara	$15,000	SE
55				**Environmental Education Subtotal =**	**$2,640,000**	
56	**G. Creative Ideas (5 proposals/subtotal = $1,740,000)**					
57	215-G	Making Ecosystem Services Pay in Agricultural Watersheds	Land Stewardship Project	VanDerPol, Terry	$247,000	Central
58	216-G	Science and Innovation from the Soudan Underground Mine State Park	U of MN	Gralnick, Jeffrey	$545,000	Statewide
59	217-G	Identifying Critical Habitats for Moose in Northeastern Minnesota	UMD, NRRI	Moen, Ron	$507,000	NE
60	220-G	Quantifying Carbon Burial in Healthy Minnesota Wetlands	U of MN	Cotner, James	$144,000	Statewide
61	221-G	Mitigating Pollinator Decline in Minnesota	U of MN	Krischik, Vera	$297,000	Statewide
62				**Creative Ideas Subtotal =**	**$1,740,000**	
63				**OVERALL TOTAL =**	**$26,029,000**	

LCCMR ID: 019-A3, Updating the Minnesota Wetlands Inventory
MN Department of Natural Resources (DNR), $1,100,000

This is the second phase of a multi-phase project to update the National Wetlands Inventory (NWI) for the state of Minnesota. The overall goal of this project is to improve wetland protection and management in Minnesota by updating wetland inventory maps for the state. The NWI provides critical baseline data that inform many wetland management actions and policies. The NWI data need to be updated because the original data are either severely out-of-date or in some instances they were not very accurately mapped in the first place.

The current project phase will: 1) update maps for 13 counties in east-central Minnesota surrounding the greater Twin Cities metropolitan area (figure 1); 2) evaluate imagery sources and mapping technologies to identify the most cost-effective, reliable inventory procedures for the agricultural regions of the state; and 3) acquire any additional primary data (digital aerial photography) required to update wetland inventory maps for southern Minnesota, which will be the next phase of the overall project. The wetland inventory maps for the current phase will be updated using contemporary aerial photography as well as available high resolution elevation data. Subsequent phases of the statewide wetland inventory update will follow the acquisition of high-resolution elevation data acquired through the Minnesota LiDAR acquisition project. Updated maps and imagery will be made available to the public through the Internet.

LCCMR ID: 020-A3, Sustainable, Cost-Effective Approaches to Management of Shallow Lakes
MN Department of Natural Resources (DNR), $262,000

Minnesota's shallow lakes provide numerous valuable ecosystem services and habitat for native species along with direct human benefits including clean water, recreational opportunities, and carbon sequestration. Unfortunately, water and habitat quality of Minnesota's shallow lakes have deteriorated dramatically during the past century. Conversion from native upland covers, widespread wetland drainage and surface-water consolidation to facilitate agricultural and urban/residential development have been implicated as major causes for these changes. We propose to study approximately 160 shallow lakes in six ecological regions of Minnesota to 1) identify major factors leading to deterioration, 2) evaluate results of specific lake restoration approaches, including cost-effectiveness of various combinations of lake management strategies, and 3) assess the impacts of increased surface water connectivity on fish invasions and resulting habitat quality. Our efforts will include extensive sampling of shallow lakes to identify direct and indirect causes of deterioration, evaluation of approximately eight lakes currently undergoing rehabilitation, and economic analyses to determine which restoration strategies are likely to produce the greatest improvements in water quality and other lake characteristics per unit cost. Ultimately, our results will allow municipalities, state, county, and local governments, and private organizations to identify cost-effective approaches for maintaining and restoring ecological integrity of shallow lakes throughout Minnesota. Special attention will be directed towards development of regionally-specific recommendations for sustainable lake management.

LCCMR ID: 024-A3, Assessing the Cumulative Impacts to Near-Shore, In-Water Habitat
University of Minnesota (U of MN), $300,000

Human structures related to shoreline development, such as docks, boatlifts, and other structures, and disturbance from recreational activity may have a cumulative impact on aquatic ecosystems. Near-shore areas (less than 4 meters deep) often contain most of the vegetation and are generally the spawning area for fish. Few studies have addressed the effects of incremental changes on lake ecosystems despite ongoing concerns about the rate and extent of near-shore, in-water habitat alterations, and expansion of in-lake structures. The lack of scientific knowledge on the cumulative effects of human activities on aquatic habitat, water quality, and fish populations has hindered regulatory authorities and lake managers who need better information to guide landowners toward lower impact practices. To address this lack of information, we will assess the extent of near-shore vegetation, fish, and macroinvertebrates along a gradient of shoreline development and develop a framework to assess cumulative impacts on whole lake systems. We will use aerial photos and existing DNR data to measure whole lake disturbances of ~100 lakes in the Northern Lakes and Forests Ecoregion. We will also conduct assessments of a subset of lakes (~30) at the individual lot scale, to quantify impacts to vegetation, fish, and macroinvertebrates along a gradient of shoreline development and shoreline types. We will use our research develop a model to predict the cumulative impact of development on aquatic ecosystems, providing a tool to guide lake managers toward sustainable near-shore, in-water development.

LCCMR ID: 026-A3, Predicting and Mitigating Vulnerability of Trout Streams
University of Minnesota (U of MN), $300,000

Trout require streams with excellent water quality that are fed by groundwaters which keep streams cold in summer but ice-free in winter. The trout sport-fishing industry is vulnerable to global climate changes that can increase stream temperatures, alter the cold-adapted aquatic insects that form trout diets, and affect trout reproduction. Increasing air temperatures are predicted to dramatically change winter thermal conditions in trout streams. Our objectives are to: (1) investigate the role of stream bank vegetation and adjacent land use to minimize changes in stream temperatures in relation to climate change; (2) determine winter diets and growth of trout populations; and (3) determine kinds, abundances, and timing of growth patterns of cold-adapted insects that are essential in winter diets of trout. We will work on 36 trout streams in the Driftless Area, using GIS plus habitat surveys for objective (1); seining and standard diet analysis techniques objective (2); and rapid bioassessment protocols objective (3). The project will identify and rank the most vulnerable streams and cold-adapted insects that are most critical to trout diets and growth. Trout fishing annually provides more than $150 million dollars in direct expenditures to local economies in Minnesota and $654 million through the Driftless Region (Trout Unlimited, 2008). With re-circulating dollars this represents more than one-billion dollars of economic stimulus to local economies. Our results will enable us to identify streams and food species that are most vulnerable to increasing temperatures, and translate scientific results into management strategies to protect and conserve this valuable industry.

LCCMR ID: 035-A3, Mapleton Area Agricultural/Urban Runoff Water Quality Treatment Analysis
Blue Earth County Drainage Authority, $485,000

This project serves to provide a demonstration and model for future drainage projects across the state. The project focuses on Blue Earth County Ditch 57 which is part of the Le Sueur River Minor Watershed of the Minnesota River Basin. This watershed is comprised of agricultural land and the entire City of Mapleton. This is a community-based water quality and treatment demonstration project in which landowners, local government, and state agencies have developed a watershed approach to improving water quality and replacing outdated drainage systems. The project goals are to improve water quality, increase diversified habitat, provide a unique demonstration project, and develop a process for future projects. The project proposes to construct 6 water quality features throughout the 6,000 acre watershed. LCCMR funding is requested for assistance to construct 5 of the structures including two surge basins accumulating 44 acre-feet of storage for runoff, in-channel treatment consisting of a two-stage ditch and sediment trap, native grass buffer strips along 4.1 miles of open ditch, and a weir at the outlet of the ditch to reduce peak flow and divert runoff to US Fish and Wildlife property. Nine monitoring stations are also proposed. The project will be monitored for flow and water quality for 3 years. A technical memorandum will be developed stating the impact to water quality and how these features can be incorporated into other drainage projects. After presentations of the results this project could represent a fundamental shift in the way rural drainage systems impact the landscape.

LCCMR ID: 048-B1, Sustainable Biofuels: Impacts of Climate Change and Management
University of Minnesota (U of MN), $221,000

Perennial grassland ecosystems have the potential to provide Minnesota with locally grown energy sources that reduce greenhouse gas emissions, improve water quality, and provide other services. Perennial grassland crops seem likely to be fertilized and/or irrigated and to experience climate change in the coming decades. However the effects of these factors on the potential benefits of alternative biomass crops, including switchgrass and Miscanthus monocultures and diverse prairie plantings, are unstudied and unknown. Soils are the largest storehouse of carbon in Minnesota, and soil carbon sequestration may become a marketed item as part of a carbon cap and trade system. The net effects of warming, fertilization and irrigation on soil carbon storage, though, have not been tested. Similarly, we do not know how either the biomass yields of alternative crops or their susceptibility to invasion by exotic plant species might be impacted by these factors.

This project would use a Fertilization-Irrigation Experiment (consisting of 96 plots) and a Warming Experiment (consisting of 114 plots) to determine how irrigation, fertilization, and climate warming impact yields, carbon sequestration, plant biodiversity, water quality and susceptibility to invasion of grasslands of varying diversity (1, 4, 16 or 32 plant species). It would also monitor whether Miscanthus, an exotic perennial grass species, poses a threat as a pernicious invasive. Our results will be synthesized to find methods for optimizing biofuel production, carbon storage, and habitat restoration.

LCCMR ID: 082-C, Ecological Restoration Training Cooperative
University of Minnesota (U of MN), $550,000

Ecological restoration is increasingly relied on as a conservation strategy in Minnesota even though project failure rates remain high. Although Minnesota has many competent restorationists, the quality of work varies across the profession and lack of expertise contributes to project failures. Existing workshop-based programs aimed at the public focus on a narrow range of practices that are feasible for individual landowners to implement. Currently, professional restoration training is limited to what is gained on-the-job, often through trial-and-error. Our aim is to improve ecological restoration success in Minnesota by developing training opportunities for practicing restoration professionals. High-quality training opportunities need to reach a large number of professionals statewide. Our solution is to establish the Ecological Restoration Training Cooperative, to be based at the University of Minnesota, and coordinated as a partnership between state agencies and the University. A program of web-based, instructor-guided learning, combined with field sessions offered at multiple locations will be the first of its kind in the US for restoration. Over 700 Minnesota restoration professionals actively involved in planning, plant or seed production, installation, maintenance and monitoring, could benefit. As part of this project, the training cooperative will develop and offer five application-oriented courses accessible statewide through a combination of online and field-based instruction. These courses address the major aspects of restoration practice; the range of offerings can expand over time, in response to professional needs. Following basic courses, professionals can stay current through webinars, the "community of practice" online forum, and annual conferences that will be launched as part of this project.

LCCMR ID: 087-C, SNA & Native Prairie Restoration, Enhancement and Acquisition
MN Department of Natural Resources (DNR), $1,750,000

Sites of biodiversity significance would be permanently protected, their quality improved, and landowner and public support for their conservation increased by implementation of a suite of tools through the DNR Scientific and Natural Area (SNA) Program.

Seventy acres of high quality native prairie and other native plant communities of state significance would be acquired in fee as state Scientific and Natural Area (SNA) or as a Native Prairie Bank (NPB) conservation easement. Sites are MCBS priorities because they contain rare and endangered species, undisturbed plant communities, and key habitats for Species of Greatest Conservation Need. Conservation easement monitoring would be initiated on new NPB sites and on 13 NPBs previously acquired through LCMR funding.

Native habitat improvements (restoration, prescribed burning, and invasives treatment) would be implemented on about 3200 acres of SNAs, NPBs, and high priority private prairie lands that are threatened or degraded by human impacts, invasives, and/or lack of natural disturbance regimes. Interpretive signs-kiosks would be installed at about 4 SNAs and development work (signs, fences, site cleanup, etc.) completed at about 5 sites. Adaptive management plans would be completed for 9 sites. Habitat management at about 18 sites would be ecologically monitored to continuously improve methods.

Conservation by private landowners of native prairie would be achieved through prairie management consultation to at least 40 private landowners, delivery of 30 prairie stewardship plans, co-hosting 6 workshops/field days, distributing new education materials, and enrolling or certifying about 90 landowners in the Prairie Tax Exemption (PTE) Program.

LCCMR ID: 092-C, Reconnecting Minnesota's Fragmented Prairie Landscapes
The Nature Conservancy, $380,000

Less than 1% of Minnesota's original tallgrass prairie remains today and what is left are scattered remnants. Restoration of prairie ecosystems requires both protection and reconnection of remnants to create landscape areas of 10,000 to 50,000 acres.

In order to restore and sustain prairie landscapes, we must develop prairie-based economies that generate a sustainable income for local communities. Grazing, haying, and native seed production show great promise, but must be managed to also produce desired conservation results.

This project will work within three of the 38 prairie landscapes identified by the County Biological Survey. For each of the three areas, a prairie reconnection landscape plan will be developed in cooperation with local residents and conservation entities. Plans will designate priority lands for restoration, preservation, and economic development. Economic opportunities for different prairie-based ventures will be identified and explored for the market and resources unique to each landscape. Key issues associated with large scale prairie restoration will also be addressed such as appropriate techniques, seed mixes, and seed sources for each landscape.

In cooperation with the University of Minnesota, an economic analysis of innovative prairie-based ventures will be conducted focusing on removing obstacles to sustainable agriculture and exploring the feasibility of business opportunities such as grass-fed beef, grazing collaboratives, grass banks, native seed production, second-generation bioenergy, and carbon markets.

The project will facilitate direct conservation action across each specific landscape. By showcasing prairie-based agriculture, the project has the long-term potential of leveraging results across dozens of Minnesota's remaining prairie landscapes.

LCCMR ID: 095-C, Protection of Granite Rock Outcrop Ecosystem
Renville SWCD, $1,800,000

The Minnesota River Valley contains exposed ancient granite rock outcrops that provide unique landscape features, as well as habitat for specialized plant and animal communities rarely found elsewhere in Minnesota. Rock outcrops are threatened by mining, overgrazing and other development interests. Removal of the rock results in severe degradation and permanent loss of these unique landscape features. The narrow Minnesota River Corridor is easily susceptible to fragmentation. Past development activities and mining operations have already fragmented large areas of the fragile landscape. Demand for aggregate is growing as our population and infrastructure grow. Aggregate is in short supply in many areas, including metropolitan areas, because development has made it inaccessible. Interest in mining exposed granite rock outcrops in the Minnesota River Valley is high because the rock is readily available and there is no overburden to remove. This encourages the practice of horizontal mining, removing the easiest and most profitable rock, and moving on. Unlike gravel mining operations, there is no reclamation plan possible for replacing this unique landscape feature once it is removed. Rock outcrops are a component of the Minnesota River's riparian zone, and destruction of this unique habitat will degrade the water quality and wildlife habitat of the Minnesota River and its tributaries. This project will offer an economically viable option for landowners to preserve and enhance rock outcrops within a five county area of the Upper Minnesota River Valley. Perpetual conservation easements will protect 702.8 acres.

LCCMR ID: 097-C, Conserving Sensitive and Priority Shorelands in Cass County
Cass County Environmental Services Department, $300,000

Cass County's 500+ high quality lakes provide critical habitat for fish and wildlife and are the focal points for many Minnesotan's recreational enjoyment. They are also the economic engines that sustain local communities. The future quality of these water resources is threatened by increasing population growth and shoreland development. In 2008, the Leech Lake Area Watershed Foundation and Cass County conducted a mapping project of the County's 55 most developed lakes and found that approximately 38% of the shorelands are large, undeveloped or minimally developed, privately owned parcels that have "high conservation potential." Some of these same parcels have been identified by the MN DNR as sensitive shorelands highly vulnerable to development.

This project will target landowners on the identified sensitive shorelands and encourage them to donate conservation easements on their shoreland. It will provide those landowners a financial incentive of up to $15,000 for out-of-pocket costs to close the easements. Lake associations will be a key partner in securing the conservation easements. Permanent protection of 1,200-1,500 acres of riparian land, including 3-5 miles of sensitive and/or priority shorelands, will be achieved through the donation of 12-15 conservation easements. The majority of the donated easements will be in Cass County, though sensitive shoreland parcels in other North Central Counties will be considered. This project is a model for cost-effective, long-term protection of recreational opportunities, water quality, and critical land and aquatic habitats on the highest and most sensitive lakeshores in Cass County and throughout North Central Minnesota.

LCCMR ID: 101-C, Habitat Conservation Partnership Phase VII
Pheasants Forever, $1,400,000

II. PROJECT SUMMARY AND RESULTS: Sustained funding and effort by public/private partnerships is essential to protection and restoration efforts aimed at restoring landscape and/or natural resource function. Much of our prairie, wetlands, shorelines, and watersheds have been degraded over a roughly 150-year period, and we cannot restore the "remarkable place known as Minnesota," without a long-term view, ongoing funding, and focus from conservationists towards that goal. Minnesota's Habitat Conservation Partnership is a sustained effort (est. in 2000) designed to restore and protect working landscapes & restore landscape function through such a long-term effort.

We will restore, manage or protect 2,893 acres (1,653-acres restored/enhanced; 1,120-acres protected by perpetual easement; 120-acres protected in fee) within defined project areas, addressing many of the recommendations cited in the *Statewide Conservation and Preservation Plan* which states **"...habitat issues are arguably the most important issues facing the conservation and preservation of natural resources throughout Minnesota."** We address habitat issues by doing habitat restoration, habitat enhancement, and permanent habitat protection (easement & fee-title).

Eleven formal partners commit $2,520,000 (1.8:1 ratio) in other non-state resources towards achieving the 2,893-acre goal. Table 1 (attached) provides a summary of individual partner efforts to restore & protect land. The attached map describes project areas (identical to 2009 project areas) as depicts project locations since inception. Each individual partner outlined in Table 1 also has a detailed work plan outlining results and methods.

1. Project Coordination, Mapping, Data Management		
a) Project Coordination and Mapping[2]	Pheasants Forever	$ -
SUBTOTAL		$ -
2. Restoration & Management		
b) Partners for Wildlife	U.S. Fish & Wildlife Ser	$ -
c) Shallow Lake Enhancement	Ducks Unlimited (DU)	30,000
d) Shallow Lake Assessment and Management	DNR Wildlife	45,000
e) Shallow lakes, impoundments, wild rice & waterfowl	Leech Lake Reserv.	50,000
f) Campaign for Conservation - Restoration	The Nature Cons.	103,200
g) Wildlife Areas Management [1]	DNR Wildlife	-
h) Fisheries Habitat Restoration	DNR Fisheries	100,000
i) Bluffland Restoration	Nat'l Wild Turkey Fed	50,000
j) Prairie Management	DNR Ecological Serv.	63,000
k) Working Lands Partnership	Friends of Detroit Lakes	45,000
3. Conservation Easement Programs		
a) Shoreland Protection Program	Minnesota Land Trust	102,000
b) Shallow Lake Easements	Ducks Unlimited	$ 45,000
c) Wetlands Reserve Program	DU/USDA NRCS	350,000
4. Habitat Acquisition Programs		
b) Fisheries Land Acquisition	DNR Fisheries	$ 100,000
c) Critical Lands Protection Program	Trust for Public Land	200,000
d) Campaign for Conservation	The Nature Cons.	106,800
f) Professional Services	DNR Wildlife	10,000
TOTAL		**$ 1,400,000**

LCCMR ID: 102-C, Metropolitan Conservation Corridors Phase 5 Supplemental
MN Department of Natural Resources (DNR), $1,800,000

The Metro Conservation Corridors (MeCC) partnership is a collaboration of nine partners organized to accelerate protection and restoration of remaining high-quality natural lands in the greater Twin Cities area by strategically coordinating and focusing conservation efforts within a connected network of critical lands.

This phase is supplemental to Phase 5 of this project and is focused on unique opportunities that are not funded through prior phases. This supplemental phase includes only four of the nine partners.

Specifically, the partners will achieve the following results:

Result 1: Restore or enhance 50 acres of habitat along the Minnesota River
Lands to be restored include wetland, oak savanna, grassland, and floodplain forest habitat along the Minnesota River within new units of the Minnesota Valley National Wildlife Refuge in LeSueur, Scott and/or Sibley counties. All restoration work will be permanently protected and managed by the U.S. Fish and Wildlife Service and will be open to the public. *(Friends of the Minnesota Valley)*

Result 2: Protect at least 174 acres of habitat through fee acquisition and conservation easement acquisition

Specifically, this result includes:

1. Fee title acquisition of 100 acres of significant habitat in the Minnesota River Valley within LeSueur, Scott and/or Sibley Counties. After restoration, lands will be donated to the U.S. Fish and Wildlife Service for management as part of the Minnesota Valley National Wildlife Refuge. *(Minnesota Valley National Wildlife Refuge Trust, Inc.*

2. Fee title acquisition of 34 acres of lakeshore, fen, wetlands and forested habitat in Scott and/or Chisago counties. Protection projects will enhance currently protected lands. *(The Trust for Public Land)*

3. Acquisition of 1-2 perpetual conservation easements, protecting 40-80 acres of high-quality forest and wetland habitats, that will prohibit land uses that harm habitat and other conservation values. *(Minnesota Land Trust)*

Minnesota Valley National Wildlife Refuge Trust, Inc.	$350,000
The Trust for Public Land	$915,000
Minnesota Land Trust	$485,000
Friends of Minnesota Valley	$50,000
TOTAL	**$1,800,000**

LCCMR ID: 112-D, Healthy Forests to Resist Invasion
University of Minnesota (U of MN), $359,000

In Minnesota, invasive plants cause considerable ecological and economic damage, and their control is difficult to achieve in a long-term cost-effective manner. Although not immune from invasion, healthy forests may be somewhat resistant to invasion; therefore management aimed at maintaining, restoring, or enhancing key forest characteristics might be a useful strategy for slowing forest invasion. This type of preemptive tool could help maintain diverse forest systems and might be cheaper and more effective in some instances than trying to remove invaders after they are present. Consequently, our goal is to better understand whether forest characteristics, especially those amenable to management, can be effective deterrents to plant invasion. We will establish 80 forest study sites and assess invasive plant species and a set of key indicators relevant to invasion, including disturbance history; degree of tree canopy cover; native plant diversity; levels of light and soil resources; and other. We will determine the links between forest attributes and plant invasion, attempt to discern cause and effect, and based on this information develop guidelines for forest management to resist invasion. These will be provided to resource managers and the public. Information learned in the study can aid in the development of land management prescriptions that incorporate the current invasive status of the plant community and the health and integrity of the ecosystem, which will serve as an indicator of vulnerability to invasion. This information is critical to maintaining a resilient forest system in the face of future climate change coupled with invasive species.

LCCMR ID: 239-D, Ecological and Hydrological Impacts of Emerald Ash Borer
University of Minnesota (U of MN), $636,000

The Emerald Ash Borer (EAB) has been decimating ash throughout the Great Lake States and is currently advancing into Minnesota, threatening the future of the ash forests that occur across much of the state. Of particular concern is the impact EAB will have on the ecology and functioning of black ash swamps, which cover over one million acres in Minnesota and represent the state's most common ash forest type. Black ash trees grow and thrive in swamps and occupy a unique wet niche where few other tree species grow. As a result, EAB impacts on black ash swamps will likely be extreme, resulting in dramatic changes in native plant communities and increasing the potential for invasion by exotic plant species.

This project will increase our understanding of the ecological and hydrological impacts of EAB through the establishment of a network of research sites in black ash forests in Minnesota. Treatments simulating EAB-induced ash mortality will be implemented at each site to characterize how the loss of ash from these systems will impact native plant communities, the spread of invasive species, and site hydrology. In addition, the survival and growth of a mixture of planted tree seedlings will be evaluated to determine what species might be able to mitigate the ecological impacts of the loss of black ash from these forests. Results from this project will allow for predictions into how EAB will affect northern Minnesota's forests and will inform management recommendations for mitigating impacts of this exotic insect.

LCCMR ID: 142-E2, Strategic Planning for Minnesota's Natural and Artificial Watersheds
University of Minnesota (U of MN), $327,000

Minnesota's natural and artificial watersheds are intimately linked. Water and pollutants from artificial watersheds often disturbs the hydrologic regime and impairs water quality in natural watersheds. This project aims to disconnect Minnesota's artificial and natural watersheds by using GIS techniques to identify locations that are suitable for installation of wetlands, riparian buffer strips and perennial vegetation. GIS datalayers collected will include high resolution elevation and aerial photos where available, hydrology, land use, and soils. Efficient computer algorithms for analysis of high resolution elevation data and aerial photos will be developed to identify locations in the artificial watersheds where they are hydrologically connected to the natural watersheds. GIS techniques will be used to process the collected datalayers and identify the optimum locations for wetlands, riparian buffer strips and perennial vegetation. Project deliverables will include data maps, improved software for terrain analysis and image analysis, GIS based maps and reports documenting artificial watersheds and GIS based maps and reports identifying optimal locations for the placement of wetlands and vegetated buffers to disconnect the artificial and natural watersheds. This project will lead to information that can be used to restore and maintain the integrity, purity and health of Minnesota's natural watersheds. Decoupling the artificial and natural watersheds is needed to reduce flooding and water quality impairments, expand wildlife habitat, increase supply of renewable energy, and reduce greenhouse gas emissions.

LCCMR ID: 166-F, Minnesota Conservation Apprenticeship Academy
Board of Water and Soil Resources (BWSR), $368,000

Familiarizing future conservation leaders with Minnesota's various land-use practices, water and soil resources, plant and animal habitats, and landowner concerns is needed to maintain the capacity of local organizations to deliver conservation on the ground. Many of the conservation districts' most experienced conservation professionals and practitioners are nearing retirement age but due to budget constraints will not be replaced until they have left employment. Consequently, Minnesota is missing a great opportunity to transfer knowledge and experience to the next generation responsible for Minnesota's conservation.

While college graduates with conservation-related degrees are knowledgeable in technology, theory, and research methods, their practical, on-the-ground skills need development. Communicating with landowners and adjusting designs for field nuances are vital to the success of conservation projects and best learned from seasoned professionals. In turn, apprentices will bring knowledge of emerging technologies and other innovations to improve the quality and productivity of current conservation efforts. This allows for a cross-pollination of ideas and solutions for natural resource challenges.

This program will approach environmental-related departments at several universities beginning in the fall of 2010 to recruit current students for apprenticeship positions during the summers of 2011 and 2012. The Minnesota Conservation Corps (MCC) will be the employer of record, however 30 Soil and Water Conservation Districts will provide a workplace, mentor, and daily supervision. MCC will pay a monthly stipend and provide for AmeriCorps service credits and educational rewards.

LCCMR ID: 166-F, Minnesota Conservation Apprenticeship Academy
Board of Water and Soil Resources (BWSR), $368,000

Subd. 3e Restorable Wetlands Inventory
Ducks Unlimited, Inc., $300,000

$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.

Subd. 4e Minnesota's Habitat Conservation Partnership (HCP) - Phase VI
Pheasants Forever, Inc., $3,375,000

$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.

Subd. 4f Metro Conservation Corridors (MeCC) - Phase V
MN Department of Natural Resources (DNR), $3,375,000

$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 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.

Subd. 4g Statewide Ecological Ranking of Conservation Reserve Program (CRP) and Other Critical Lands
Board of Water and Soil Resources (BWSR), $107,000

$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.

Subd. 4i MN Farm Bill Assistance Project
Board of Water and Soil Resources (BWSR), $1,000,000

$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.

Subd. 5c Cooperative Habitat Research in Deep Lakes
MN Department of Natural Resources (DNR), $825,000

$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.

Subd. 5d Intensified Tile Drainage Evaluation
Science Museum of Minnesota, $300,000

$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.

Subd. 3m Accelerated Prairie Management, Survey, Acquisition and Evaluation
MN Department of Natural Resources (DNR), $1,250,000

Funds will be used by the Department of Natural Resources (DNR) to benefit the less than 1% of remaining prairie lands in the western and southern portions of the state. Specific work includes: 1) conducting a rapid assessment of the status of remaining native prairie sites in the state; 2) accelerating the Minnesota County Biological Survey (MCBS) in the prairie region of the state; 3) providing increased technical assistance to private prairie landowners; 4) accelerating management of public and private prairie lands; 5) monitoring and evaluating prairie condition and associated wildlife; and 6) acquiring approximately 150 acres of prairie natural areas, prairie bank easements, and buffers.

Subd. 3q Biofuel Production and Wildlife Conservation in Working Prairies
University of Minnesota (U of MN), $500,000

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.

Subd. 5c Land Retirement Effects on Minnesota River Basin Streams
U.S. Geological Survey, $275,000

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.

Subd. 5d Demonstrating Benefits of Conservation Grasslands on Water Quality
Science Museum of Minnesota, $374,000

Natural vegetation on lands adjacent to lakes, streams, and rivers provides important habitat and water quality benefits. The Science Museum of Minnesota will study the long-term benefits of lakeside grasslands to better understand the role such vegetation can play in helping reduce the pollutants that run into our lakes, streams, and rivers.

Subd. 5n Cedar Creek Groundwater Project using Prairie Biofuel Buffers
University of Minnesota (U of MN), $659,000

Biofuels-substitutes for petroleum-based fuel derived from vegetable crops-are currently largely derived from corn. However, native prairie plants have the potential to provide the raw material for high quality cellulosic biofuels, which require less water and agricultural chemicals. At the same time, these plants can provide wildlife habitat, capture pollutants before they enter groundwater, and help reduce greenhouse gas emissions. The University of Minnesota's Cedar Creek Natural History Area will study the ability of prairie plants to simultaneously achieve these various aims.