**M.L. 2011-12 Projects Completed in 2015-2016**
**MN Laws 2011, 1st Special Session, Chapter 2, Article 3, Section 2 (beginning July 1, 2011)**

**MN Laws 2012, Chp. 264, Article 4, Section 3 (beginning July 1, 2012)**

For Minnesota's FY 2012-13 biennium (July 1, 2011 - June 30, 2013), approximately $25.3 million was 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 2011-12 Request for Proposal (RFP) due April 9, 2010, 241 proposals requesting a total of approximately $163.8 million were received. After full consideration of all proposals received through a competitive, multi-step process, on 07/14/10 the LCCMR selected 92 projects to be included in 87 appropriation recommendations to the 2011 Minnesota Legislature. The 2011 Legislature adopted 61 of the recommendations, including 52 without any changes and 9 at a decreased or increased dollar amount; dropped 26 of the recommendations; and added 8 additional appropriations for a total of 69 total appropriations. All 69 appropriations were signed into law (M.L. 2011, 1st Special Session, Chapter 2, Article 3) by the Governor on 07/20/11. The 2012 Legislature altered the 2011 appropriations to reduce the amounts appropriated to two projects in 2011 and add one new project in 2012 (M.L. 2012, Chp. 264, Art.4, Sec. 3).

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.

When available, we have provided links to web sites related to the project. The sites linked to this page are not created, maintained, or endorsed by the LCCMR office or the Minnesota Legislature.

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**Subd. 03 Natural Resource Data and Information**

03b County Geologic Atlases for Sustainable Water Management

03d Updating National Wetland Inventory for Minnesota - Phase III

03f Determining Causes of Mortality in Moose Populations - **RESEARCH**

03j Information System for Wildlife and Aquatic Management Areas

**Subd. 04 Land, Habitat, and Recreation**

04b State Parks and Trails Land Acquisition

04g Minnesota River Valley Green Corridor Scientific and Natural Area Acquisition

04i Metropolitan Conservation Corridors (MeCC) - Phase VI

04q Restoration Strategies for Ditched Peatland and Scientific and Natural Areas - **RESEARCH**

**Subd. 06 Aquatic and Terrestrial Invasive Species**

06a Improved Detection of Harmful Microbes in Ballast Water - **RESEARCH**

06c Evaluation of Switchgrass as Biofuel Crop - **RESEARCH**

**Subd. 08 Environmental Education**

08b Minnesota Junior Master Naturalist Program

**Subd. 09 Emerging Issues**

09a Minnesota Conservation Apprentice Academy

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**MN Laws 2011, 1st Special Session, Chapter 2, Article 3, Section 2**

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**Subd. 03 Natural Resource Data and Information**

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**County Geologic Atlases for Sustainable Water Management**
Subd. 03b $1,800,000 TF

**Part 1 ($1,200,000)**
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**Part 2 ($600,000)**
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**Appropriation Language**
$900,000 the first year and $900,000 the second year are from the trust fund to accelerate the production of county geologic atlases to provide information essential to sustainable management of ground water resources by defining aquifer boundaries and the connection of aquifers to the land surface and surface water resources. Of this appropriation, $600,000 each year is to the Board of Regents of the University of Minnesota for the Geologic Survey and $300,000 each year is to the commissioner of natural resources. This appropriation is available until June 30, 2015, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
The Minnesota County Geologic Atlas program is an ongoing effort begun in 1982 that is being conducted jointly by the University of Minnesota's Minnesota Geological Survey and the Minnesota Department of Natural Resources (DNR). The program collects information on the geology of Minnesota to create maps and reports depicting the characteristics and pollution sensitivity of Minnesota's ground-water resources and their interaction with surface waters. The information from County Geologic Atlases is used in planning and environmental protection efforts at all levels of government, by

businesses, and by homeowners to ensure sound and sustainable planning, management, and protection of water resources used for drinking, agriculture, industry, and more. This appropriation will:

- Support completion of geologic atlases for Carlton, McLeod, Carver, Benton, and Chisago counties.
- Support ongoing work on geologic atlases for Anoka, Blue Earth, Clay, Nicollet, Renville, Sibley, and Wright counties;
- Initiate geologic atlases for three or more additional counties;
- Make collected data available in a digital format.

**PART 1 - MINNESOTA GEOLOGICAL SURVEY**

**OVERALL PROJECT OUTCOME AND RESULTS**

The Minnesota Geological Survey maps sediment and rock because these materials control where water can enter the subsurface (recharge), where and how much water can reside in the ground (aquifers), where the water re-emerges (discharge), and at what rates this movement occurs. This information is essential to managing the quality of our water and the quantity that can be sustainably pumped. This project substantially completed geologic atlases for Meeker, Redwood, and Brown counties, and contributed to atlas work in Anoka and Wright counties. Information about the geology is gleaned from the records of domestic wells, and from drilling conducted for this project. In Meeker County we used 3,600 wells and 6 cores, in Redwood we used 1,900 wells and 10 cores, and in Brown County we used 1,700 wells and 8 cores, and soil borings and geophysical surveys. From the data we created maps of the geology immediately beneath the soil; the aquifers within the glacial sediment; and the shape, elevation, and rock types of the bedrock surface. These maps and data support monitoring, wellhead protection, water appropriation, clean-ups, and supply management.

In large portions of Brown and Redwood counties the glacial materials are relatively thin, and most of the bedrock types present do not provide much water. This makes the mapping of glacial sand bodies, which are potential aquifers, very important. Our maps will guide wise use and protection of these water supplies. In Meeker County, the glacial deposits can be very thick, and the bedrock includes some formations that can serve as aquifers. This is a more diverse and complicated ground water distribution. In all three counties the database of well construction records we have compiled is an excellent indicator of which aquifers the population is currently relying on.

**PROJECT RESULTS USE AND DISSEMINATION**

County geologic atlases are distributed in print and digital formats. The digital format allows us to include all the data that support the maps and the ability to change the maps or create new ones. The products are available from the MGS web site (http://www.mngs.umn.edu/index.html). We also conduct post-project workshops in the map area to familiarize users with the products and their applications. The products are also distributed to libraries.

**Project completed:** 6/30/2015

**FINAL REPORT**

**PART 2 - MN DNR**

**OVERALL PROJECT OUTCOME AND RESULTS**

Geologic atlases provide information essential to sustainable management of groundwater resources.

Atlases define aquifer boundaries, the connection of aquifers to the land surface, and the connection of aquifers to surface water resources. They facilitate and enhance the operations of natural resource management and regulation by state and local government units.

County Geologic Atlases are specifically identified as essential data in the Statewide Conservation Plan, and in the efforts of the Environmental Quality Board, DNR Waters, and the Water Resources Center at the University of Minnesota to design a sustainable water management process. County geologic atlases facilitate management activities to identify sustainable water use and to protect water quality.

This project continued the acceleration of County Geologic Atlases, Part B by DNR initiated under M.L. 2009 that provided ENRTF funding through June 30, 2012. This work plan provided support for ongoing Part B atlases in Carlton, Benton, McLeod, Carver, and Chisago counties and to initiate seven new Part B atlases over the project period including Blue Earth, Nicollet, Sibley, Anoka, Clay, Renville, and Wright counties. The Carlton, Benton, McLeod, Carver, and Chisago county geologic atlases, Part B were completed, printed, and distributed; local training workshops were held for all completed atlases. Blue Earth, Nicollet, Sibley, Anoka, Clay, Renville, and Wright county Part B geologic atlases were all initiated. Project staff also assisted the initiation of the Part B Sherburne county geologic atlas.

All initiated projects completed initial analysis and groundwater sample collection with only carbon-14 sample collection and analysis remaining for the Renville atlas project. Well owners received reports of the chemical analysis of samples from their well. The format for new atlas reports was redesigned to a USGS-style science report format that will allow an expansion of the information presented in the report. All future atlas reports beginning with Blue Earth will use the new report format. The Blue Earth report is in final draft in the new format with reports for the Nicollet and Sibley atlases in development. Technical analysis and map development for other projects is underway.

The County Geologic Atlas series of reports is a long-term joint effort by the Minnesota Geological Survey and DNR to complete County Geologic Atlases for all counties in the state. Initiated Part B atlas projects mentioned above will be completed with additional existing ENRTF funding. Future Part B atlases are planned for Part A atlases that have been completed by the MGS, including Morrison, Houston, the Winona revision, and Meeker. Ten additional Part A county geologic atlases are currently underway by the MGS.

**PROJECT RESULTS USE AND DISSEMINATION**

The Carlton, Benton, McLeod, Carver, and Chisago county geologic atlases, Part B were completed and printed in paper format and distributed to county, libraries, state agencies, and other organizations. Printed reports are available for sale at the MGS. PDF versions of all printed reports were posted to the DNR web site at http://www.dnr.state.mn.us/waters/groundwater_section/mapping/status.html. Through DNR gov.delivery subscription, (sign up on DNR home page http://www.dnr.state.mn.us/index.html) interested persons may self-subscribe to be notified of completed projects and other DNR county geologic atlas news. Project data of completed reports, including water chemistry data and GIS data were also posted to the DNR web site. Following publication of each Part B report, a local workshop was held to introduce the report content and train users in its application. At the completion of each report, the report author prepares an article of atlas highlights for the Minnesota Ground Water Association newsletter. The membership of the MGWA includes many professional hydrogeology colleagues who use the atlas reports.

**Project completed:** 6/30/2015

**FINAL REPORT**

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**Updating National Wetland Inventory for Minnesota - Phase III**
Subd. 03d $1,500,000 TF

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**Appropriation Language**
$1,500,000 the second year 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 30,2015, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
The National Wetland Inventory, a program initiated in the 1970s, is an important tool used at all levels of government and by private industry, non-profit organizations, and private landowners for wetland regulation and management, land management and conservation planning, environmental impact assessment, and natural resource inventories. The data behind the National Wetlands Inventory for Minnesota is now considerably out-of-date and a multi-phase, multi-agency collaborative effort coordinated by the Minnesota Department of Natural Resources is underway to update the data for the whole state. This appropriation is being used to conduct the third phase of this effort, which involves updating wetland maps for 30 counties in southern Minnesota and acquiring additional data needed to update wetland maps for an additional 22 counties in central Minnesota during a future phase of the inventory.

**OVERALL PROJECT OUTCOME AND RESULTS**
Updating the National Wetland Inventory (NWI) is a key component of the State's strategy to ensure healthy wetlands and clean water for Minnesota. This effort is a multi-agency collaborative under leadership of the Minnesota Department of Natural Resources. These data are intended to replace the original 1980s NWI data. The NWI data provide a baseline for assessing the effectiveness of wetland policies and management actions. These data are used at all levels of government, as well as by private industry and non-profit organizations for wetland regulation and management, land use, conservation planning, environmental impact assessment, and natural resource inventories. The update project is being conducted in phases with data released for each region as it is finalized.

In this third phase of the overall effort, we updated wetland inventory maps for 36 counties in southern Minnesota (23,856 square miles). The overall accuracy for wetland identification is 94%. We also acquired aerial imagery data for 39,625 square miles in central and northwestern Minnesota needed for the next phases of the update.

The updated NWI data was created in accordance with federal wetland mapping guidance. This update used spring aerial imagery acquired in 2011 and lidar elevation data as well as other ancillary data.

Quality assurance of the data included visual inspection, automated checks for attribute validity and consistency, as well as a formal accuracy assessment based on an independent field data. Further details on the methods employed can be found in the technical procedures document for this project located on the project website (http://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html).

**PROJECT RESULTS USE AND DISSEMINATION<**
All wetland map data and aerial imagery are available free of charge to the public. The data have been made available through the Minnesota Geospatial Commons (https://gisdata.mn.gov/) as well as through an online wetland viewer (http://www.dnr.state.mn.us/eco/wetlands/map.html). A copy of the data has also been provided to the US Fish and Wildlife Service for inclusion in the national wetland database.

Use of the NWI data is being promoted through a variety of channels. The DNR is giving presentation about the updated NWI data at both the Minnesota Water Resources Conference and the Minnesota GIS/LIS Conference. The DNR and MnGeo are co-presenting at the Minnesota GIS/LIS Conference regarding the availability of the spring aerial imagery. A short news article was developed for the Minnesota Geospatial Commons news feed and posted in May 2015. A broader press release has also been drafted for an expected September release. Finally, a peer-reviewed journal article was published in the journal Wetlands based on the work from the previous NWI project phase.

**Project completed:** 6/30/2015

**FINAL REPORT**

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**Determining Causes of Mortality in Moose Populations**
Subd. 03f $600,000 TF

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**RESEARCH**

**Appropriation Language**
$300,000 the first year and $300,000 the second year are from the trust fund to the commissioner of natural resources to determine specific causes of moose mortality and population decline in Minnesota and to develop specific management actions to prevent further population decline. This appropriation is available until June 30, 2015, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
Moose, one of Minnesota's prized wildlife species, are dying at much higher rates in Minnesota than elsewhere in North America. Recently observed increases in mortality rates amongst some moose in northeastern Minnesota have led to concern that the population there may be starting a decline like that seen in the northwestern part of the state, where moose populations fell from over 4,000 to fewer

than 100 in less than 20 years. Additionally the specific causes of increased mortality amongst individual moose, such as potential nutritional factors, remain unknown. Scientists at the Minnesota Department of Natural Resources are using this appropriation to investigate the actual cause of death in recovered individual moose and determine what other factors may also be contributing. Once these causes of death and contributing factors are identified, it may be possible to implement management actions to address the overall population decline and help maintain healthy populations of moose in the state.

**OVERALL PROJECT OUTCOME AND RESULTS**

Minnesota's moose (*Alces alces*) are dying at rates much higher than elsewhere in North America. Recent aerial surveys indicate the northeastern population has declined 50% since 2006. Previous research in MN reported a 21% average non-hunting mortality rate, much higher than the 8-12% reported for moose elsewhere in North America. In 2013, the Minnesota DNR launched a new study to determining cause-specific mortality by deploying Iridium GPS collars on moose in northeastern MN and investigated mortalities within 24 hours of death to identify proximate cause of mortality and to examine the influence of potential contributing factors. In the first 2.5 years of this multi-year study, 156 moose have been radiocollared and annual mortality rates were 19% and 12% in 2013 and 2014, respectively; 9% of collared moose have died in the first half of 2015. Overall, 41 moose have died and causes of mortality were health-related (61%), which included bacterial infections, winter ticks, brainworm, accident, multiple chronic health issues, and other undetermined health causes, and predator-related (39%), which included confirmed and likely wolf-kills. Predisposing health issues (e.g. brainworm, pneumonia, previous injury) likely contributed to at least 6 of the wolf-killed moose. Response times from initial mortality notification (e.g. text message or email) to a team in the field at the death site were <24 hours in 23 cases (59%), between 24 and 48 hours in 10 cases (26%), and >48 hours in 6 cases (15%). Mortality implant transmitters (MITs) were deployed in 61 moose to detect instantaneous death as well as internal body temperature. Preliminary analyses of data from MITs recovered from moose that have died in Minnesota (n = 8) indicated prolonged elevated temperatures (>102 degrees F) for 10-30% of readings during the summer months. This study has documented key mortality factors to improve our understanding of the moose decline in northeastern Minnesota.

**PROJECT RESULTS USE AND DISSEMINATION<**

The moose project has received an enormous amount of media coverage, including international, national, regional, and local outlets. Minnesota DNR staff have provided presentations about this research project to international and national scientific meetings, regional meetings, and to local stakeholder groups. Links to some the highlighted media coverage and reports can be found on the project's website: http://www.dnr.state.mn.us/moose/index.html. Further, report on this project was published in the 2013 Summaries of Research Findings:
http://www.dnr.state.mn.us/publications/wildlife/research2013.html.

With the continuation of ENTRF project funding for "Moose Decline and Air Temperatures in Northeastern Minnesota", M.L. 2014, Chp. 226, Sec. 2, Subd. 5m, outreach and dissemination of this project is on-going. Peer-reviewed publication of the findings of cause-specific mortality for adult moose in this study will be initated after the completion of the third full year of the project (December 2015). Other peer-reviewed publications have been initated, including a techniques paper documenting the methods used to respond to moose mortalities within 24 of death, and a collaborative analyses of serum chemistries from moose in Minnesota, New England states (Maine, New Hampshire, and New York), and western US (Colorado, Wyoming, and Montana).

**Project completed:** 6/30/2015

**FINAL REPORT**

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**Information System for Wildlife and Aquatic Management Areas**
Subd. 03j $500,000 TF

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**Appropriation Language**
$250,000 the first year and $250,000 the second year are from the trust fund to the commissioner of natural resources to develop an information system to facilitate improved management of wildlife and fish habitat and facilities. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
The Minnesota Department of Natural Resources (DNR) manages over 2,135 state Wildlife Management Areas (WMA) and Aquatic Management Areas (AMA) containing over 1.3 million acres. This appropriation is enabling the DNR to develop an information system that will better facilitate the management of the state's WMAs and AMAs by helping to identify needs; prioritize, plan, and carry out related activities; track and assess results of activities; and make the information available to resource management professionals and the public.

**OVERALL PROJECT OUTCOME AND RESULTS**
The DNR Division of Fish and Wildlife (FAW) needed a system to manage statewide information about Wildlife Management Areas (WMAs) and Aquatic Management Areas (AMAs). This project created a new information system for assessment of and projects on, facilities and habitat on these management areas. The system has a component for proposing and managing field projects. The system also handles information about public use and access to WMAs/AMAs, which will be presented on the DNR web site.

This system is called the Wildlife and Aquatic Habitat Management Application (WAHMA). WAHMA is now being used by staff within FAW. The WAHMA application can be broken down into three components:

- WAHMAGIS - GIS based data entry and management components for WMA/AMA information. This component can be further divided into separate applications:
    - WAHMAGIS-Desktop - a Windows PC based application that can be run from DNR offices, or over any Internet connection. All WAHMA data and project management tools can be used from the Desktop application. All data that has been captured is immediately available for every WMA and AMA in an organized interface.
    - WAHMAGIS-Mobile - a smaller field application that runs on rugged tablet computers. This application can be run over a Wi-Fi connection, a 4g phone connection, or completely disconnected. All existing data about facilities and habitat can be reviewed,

added or updated. Part of the project funding was used to purchase 53 field tablets, which were distributed to FAW field staff managing WMAs and AMAs.

- WAHMA-Work Planning - a web application used for proposing and managing projects. This component allows staff to propose and prioritize projects for funding and then manage the funded projects. Regional and Central Office staff review, prioritize and approve projects. FAW Program staff use the data to bundle appropriate projects for building funding proposals.
- WAHMA-Reporting - The principle report will be the Management Guidance Document, a summary for each WMA/AMA including unit description, goals, management plans and considerations.

**PROJECT RESULTS USE AND DISSEMINATION**

WAHMA provides a foundation and tools for FAW field staff to update and build out the inventory of facilities and habitat on WMAs/AMAs. As the data is entered and updated in the system, it can then be queried to identify unmet needs and set work priorities via the project management module of the system. WAHMA is also used to record information about public recreation, access, acquisition history, management goals and plans.

WAHMA broke new ground for a project proposal and approval system. Other DNR divisions expressed interest in using the same methods, so multiple demonstrations have been held within DNR. A technical presentation was done for MN.IT Services @ DNR staff. Field users have attended multiple training sessions. Presentations have been made at regional Wildlife meetings, at the bi-annual Wildlife School, and will be made at an upcoming Fisheries Academy.

WAHMA is primarily intended for use by FAW staff in managing lands, and in planning and accomplishing projects. Field staff will be the front line of gathering information, which will be used at all levels in FAW for unit planning and determining land management needs. WAHMA is also being used to manage more detailed recreation and management information for the public, which will be delivered with a public web site redesigned to present the additional maps and information. The GIS data from WAHMA will be available through DNR's internal data resource site, and to the public via the Minnesota Geospatial Commons.

**Project completed:** 6/30/2015

**FINAL REPORT**

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**Subd. 04 Land, Habitat, and Recreation**

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**State Parks and Trails Land Acquisition**
Subd. 04b $3,000,000 TF

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**Appropriation Language**
$1,500,000 the first year and $1,500,000 the second year are from the trust fund to the commissioner of natural resources to acquire state trails and critical parcels within the statutory boundaries of state parks. State park 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. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
Privately owned lands exist within the designated boundaries of state parks throughout Minnesota. Purchase of these lands from willing landowners for addition to the state park system makes them permanently available for public recreation and enjoyment and facilitates more efficient management. Additional benefits include preserving contiguous wildlife corridors, facilitating preservation and restoration of native plant communities and cultural resources, reducing impacts of future development, and providing riparian buffers along wetlands, creeks, and lakes. The Minnesota Department of Natural Resources is using this appropriation to partially fund the acquisition of approximately 120 acres, which includes:

- 64 acres for 6.5 miles of the Brown's Creek Segment of the Willard Munger State Trail in Washington County
- 75 acres for Mille Lacs Kathio State Park in Mille Lacs County
- 3 acres for Crow Wing State Park in Cass County
- 48 acres for Tettegouche State Park in Lake County
- 20 acres for Nerstrand Big Woods State Park in Rice County

**OVERALL PROJECT OUTCOME AND RESULTS**
Environment and Natural Resources Trust Fund funding resulted in the Department of Natural Resources acquiring approximately 332 acres of land within the statutory boundaries of six Minnesota State Parks and one statutorily designated State Trail:<

- Partially fund acquisition of approximately 64 acres, 6 miles, of the Brown's Creek Segment of the Willard Munger State Trail. This segment connects the existing State Trail to Stillwater and protects a critical section of the Brown's Creek trout stream.
- Acquired approximately 75 acres within Mille Lacs Kathio State Park located in Mille Lacs County. This parcel is located within the Historic Landmark District and contains significant cultural resources and 2/3rds of the lakeshore surrounding Warren Lake.
- Acquired approximately 10 acres within Crow Wing State Park located in Cass County. This parcel contains approximately 700 feet the Crow Wing River at high risk for development, protects shoreline and provides hiking and river access.
- Acquired approximately 3 acres within Lake Vermilion-Soudan Underground Mine State Park in St. Louis County. This property is an entire island located in Cable Bay and protects the riparian resources and viewshed from Minnesota's newest state park.
- Acquired approximately 104 acres within Banning State Park in Pine County. This property preserves the natural setting of the Kettle River and connects the north and south sections of the state park. The master plan was recently updated to include a new rock climbing recreational opportunity on portions of this parcel.
- Acquired approximately 61 acres within Whitewater State Park that preserves oak woodland and small outcrop communities scattered along the cliff features with critical wildlife habitat for prairie and savanna species.

- Partially fund approximately 15 acres within Jay Cooke State Park's Oak Trail. Historical accounts have a portion of a trail passing through Gill Creek, which early European voyagers and Native Americans used this route.

Any restoration needs will be determined in accordance with each state park and/or state trail master plan. Any additional operations, maintenance and/or restoration costs required to manage the additional land will be determined and taken into consideration during the next budget planning cycle. Additional costs are not anticipated to be a significant amount of increase, and will be absorb with existing staffing and within pre-existing Division restoration plans. The State Parks and Trails resource management staff is responsible for the restoration and management of the natural/undeveloped areas not planned for facilities. For restoration efforts like converting an old field to a prairie, bonding and Legacy funds are eligible and used. Legacy monies and other sources, such as general fund and the State Parks working capital fund are used for long-term maintenance of the communities once the site has been restored.

**FINAL REPORT**

**Project completed:** 6/30/2015

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**Minnesota River Valley Green Corridor Scientific and Natural Area Acquisition**
Subd. 04g $2,000,000 TF

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**Appropriation Language**
$1,000,000 the first year and $1,000,000 the second year are from the trust fund to the commissioner of natural resources for an agreement with the Redwood Area Communities Foundation 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. 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. Up to $54,000 may be retained by the Department of Natural Resources at the request of the Redwood Area Communities Foundation for transaction costs, associated professional services, and restoration needs. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
Minnesota's Scientific and Natural Areas (SNA) Program is an effort to preserve and perpetuate the state's ecological diversity and ensure that no single rare feature is lost from any region of the state. This includes landforms, fossil remains, plant and animal communities, rare and endangered species, and other unique biotic or geological features. These sites play an important role in scientific study, public education, and outdoor recreation. The Redwood Area Communities Foundation is using this

appropriation to work in partnership with the Minnesota Department of Natural Resources to acquire approximately 420 acres of lands in the Minnesota River Valley containing some of the most ecologically sensitive plant communities, rare species, and other unique natural resources in the area. Acquired lands will be established as Scientific and Natural Areas.

**Project due to be completed:** 6/30/2016 [Extended in M.L. 2014, Chapter 226 and M.L. 2015, Chapter 76]

**Work Plan** (PDF)

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**Metropolitan Conservation Corridors (MeCC) - Phase VI**
Subd. 04i $3,475,000 TF

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**Appropriation Language**
$1,737,000 the first year and $1,738,000 the second year are from the trust fund to the commissioner of natural resources for the acceleration of agency programs and cooperative agreements. Of this appropriation, $150,000 the first year and $150,000 the second year are to the commissioner of natural resources for agency programs and $3,175,000 is for the agreements as follows: $100,000 the first year and $100,000 the second year with Friends of the Mississippi River; $517,000 the first year and $518,000 the second year with Dakota County; $200,000 the first year and $200,000 the second year with Great River Greening; $220,000 the first year and $220,000 the second year with Minnesota Land Trust; $300,000 the first year and $300,000 the second year with Minnesota Valley National Wildlife Refuge Trust, Inc.; and $250,000 the first year and $250,000 the second year with The Trust for Public Land for planning, restoring, and protecting priority natural areas in the metropolitan area, as defined under Minnesota Statutes, section 473.121, subdivision 2, and portions of the surrounding counties, through 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 habitable 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. An entity that acquires a conservation easement with appropriations from the trust fund must have a long-term stewardship plan for the easement and a fund established for monitoring and enforcing the agreement. Money appropriated from the trust fund for easement acquisition may be used to establish a monitoring, management, and enforcement fund as approved in the work program.

An annual financial report is required for any monitoring, management, and enforcement fund established, including expenditures from the fund. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

**Overall PROJECT OVERVIEW**

Though many parts of the Twin Cities metropolitan area are urbanized, there are also has large areas of natural lands that continue to serve as important habitat for fish, wildlife, and plant communities. However, pressure on these remaining lands continues to intensify as population and development pressures increase. This appropriation represents the sixth phase of an ongoing effort by a partnership of state and non-profit organizations, called the Metro Conservation Corridors (MeCC) partnership, to conduct strategic and coordinated land protection, restoration, and enhancement activities that build connections between remaining natural areas and ensures their benefits are available for future generations. This phase involves seven partners and is expected to result in the permanent protection of more than 600 acres and the restoration and enhancement of more than 750 acres.

**Individual Partner PROJECT OVERVIEWs**

- *1.1/1.2 - MeCC VI - Coordination, Mapping & Outreach & Mapping and Database Work - Minnesota Land Trust ($40,000)*
  The Minnesota Land Trust provides coordination, mapping, and data management for the Metropolitan Conservation Corridors partnership. Funds are being used to coordinate the partnership, guide strategic outreach and implementation efforts, manage project data, and provide reporting and mapping of accomplishments.
- *2.1 - MeCC VI - Restore and Enhance Significant Watershed Habitat - Friends of the Mississippi River ($200,000)*
  Friends of the Mississippi is using this appropriation to restore and enhance approximately 163 acres of permanently protected prairie and forest lands in Dakota, Washington, Ramsey, and Hennepin counties in order increase the amount of high quality habitat within designated conservation corridors. Specific activities will include updating management plans, soil preparation, prescribed burning, native vegetation installation, woody encroachment removal, and invasive species control.
- *2.3 - MeCC VI - Restoring Our Lands and Waters - Great River Greening ($400,000)*
  These funds will enable Great River Greening to restore approximately 121 acres of permanently protected forests, savanna, prairie, and wetland habitat and 0.18 miles of shoreland habitat while engaging hundreds of volunteers in the stewardship of the Metropolitan area's remaining natural areas. Specific activities include invasive species control, seeding/planting, prescribed burning, and other associated activities.
- *2.6/3.3 - MeCC VI - Priority Expansion and Restoration MN Valley NW Refuge - Minnesota Valley National Wildlife Refuge Trust Inc. ($600,000)*
  The Minnesota Valley National Wildlife Refuge Trust is using this appropriation to purchase a total of approximately 125 acres of land to expand the Minnesota Valley National Wildlife Refuge and to restore and enhance approximately 405 acres of oak savanna and remnant native prairie communities within the refuge. Many benefits are anticipated from this project, including improved habitat connectivity, protection of native species, improved water quality in the Minnesota River, and increased public access to natural lands for activities such as hiking, hunting, and fishing.
- *2.7/3.7 - MeCC VI - Dakota County Riparian and Lakeshore Protection - Dakota County ($1,035,000)*
  Through this appropriation Dakota County plans to permanently protect approximately 287

acres along rivers, including the Vermillion and Cannon Rivers, by securing conservation easements from willing landowners. For all acres protected, natural resource management plans will be prepared to ensure their long term stewardship. Additionally, restoration and enhancement activities are expected to occur on approximately 75 acres.

- *3.1 - MeCC VI - TPL's Critical Land Protection Program - Trust for Public Land ($500,000)*
  The Trust for Public Land is using this appropriation to purchase approximately 30 acres of land and 0.3 miles of shoreline with high ecological value and then convey the land to state or local governments for long-term stewardship and protection. Lands being considered for permanent protection in this round of funding include areas around the Rum River and Rice Creek in Anoka County, Lindstrom Natural Area in Chisago County, Savage Fen Scientific and Natural Area and Pike Lake in Scott County, and St. Croix/Fraconia-Scandia Scientific and Natural Area in Washington County.
- *3.2 - MeCC VI - Protect Significant Habitat by Acquiring Conservation Easements - Minnesota Land Trust ($400,000)*
  With this appropriation, the Minnesota Land Trust plans to protect 150 acres of high quality forest, prairie, or wetland habitat by securing permanent conservation easements and dedicating funds for their perpetual monitoring, management, and enforcement. Lands being considered for permanent protection in this round of funding are located in Anoka, Carver, Goodhue, Hennepin, Isanti, Washington, and Wright counties.
- *3.5 - MeCC VI - Aquatic Management Area Acquisition - MN DNR ($300,000)*
  The Minnesota Department of Natural Resources is using this appropriation to purchase 35 acres, with 0.6 miles of shoreline, along the Vermillion River in Dakota County to be managed as Aquatic Management Areas. Priority will be given to lands that have a high risk of development, provide protection to shoreline and riparian zones, and allow access for anglers and habitat improvement projects.

**Project completed:** 6/30/2015

**ABSTRACTS AND FINAL REPORTS OF INDIVIDUAL PARTNER PROJECTS** (Click project # to go to listing for that project)

- **1.1/1.2** - MeCC VI - Coordination, Mapping & Outreach and Mapping & Database Work - Minnesota Land Trust ($40,000)
- **2.1** - MeCC VI - Restore and Enhance Significant Watershed Habitat - Friends of the Mississippi River ($200,000)
- **2.3** - MeCC VI - Restoring Our Lands and Waters - Great River Greening ($400,000)
- **2.6/3.3** - MeCC VI - Priority Expansion and Restoration MN Valley NW Refuge - Minnesota Valley National Wildlife Refuge Trust, Inc. ($600,000)
- **2.7/3.7** - MeCC VI - Dakota County Riparian and Lakeshore Protection - Dakota County ($1,035,000)
- **3.1** - MeCC VI - TPL's Critical Land Protection Program - Trust for Public Land ($500,000)
- **3.2** - MeCC VI - Protect Significant Habitat by Acquiring Conservation Easements - Minnesota Land Trust ($400,000)
- **3.5** - MeCC VI - Aquatic Management Area Acquisition - MN DNR ($300,000)

**1.1/1.2 FINAL REPORT - MeCC VI - Coordination, Mapping & Outreach and Mapping & Database Work - Minnesota Land Trust ($40,000)**

***Project Outcome and Results***

During the sixth phase of the Metro Corridors project, the Minnesota Land Trust worked with landowners throughout the Twin Cities metropolitan area to permanently protect important lands and Minnesota's remaining natural areas. Three perpetual conservation easements were completed that collectively protected 317 acres of land and more than 4,300 feet of shoreline, exceeding the grant obligations by 167 acres. Two easements were purchased, both as bargain sales; one easement was donated. All three projects were unique opportunities to protect high quality natural habitat and riparian areas. These projects include:

- Sunrise Lake (Chisago County): A 79-acre property of mixed hardwood and conifer forest, wetland, grassland and agricultural field in close proximity to Carlos Avery WMA.
- Tennyson Lake (Isanti County): A 158-acre property of wetlands, mixed hardwood and pine forest, open water, grasslands, and agricultural land, with 4,375 feet of undeveloped shoreline on Tennyson Lake and Spencer Brook.
- Rush River (Sibley County): A 79-acre property of open fields, wooded blufflands, sloping ravines, and lowland forest lying adjacent to the Minnesota River and Rush River County Park.

Baseline property reports were prepared for each easement, detailing the condition of the property for future monitoring and enforcement. LCCMR provided $55,000 in grant funds to the Land Trust's dedicated Stewardship and Enforcement Fund for this required perpetual obligation. $45,000 was for the three new projects under this phase of the Metro Corridors project, while $10,500 was for an easement project from the previous phase of the Metro Corridors project. The Land Trust will report to LCCMR annually on both the status of the Stewardship and Enforcement Fund and the easements acquired with funds through this grant.

Total appraised value for the two purchased easements was $267,000, with the grant providing $209,080; donated value of these bargain sales was $57,920. No appraisal was completed for the donated easement. The cost to the State of Minnesota to complete these projects was $801 per acre. Cumulatively, across all phases of the Metro Corridors program, the Land Trust has protected 3,989 acres of critical habitat and 80,000 feet of shoreline, at a cost to the State of $453 per acre. The Land Trust's work on this project demonstrates the continued cost effectiveness of using conservation easements to protect natural and scenic resources within developed and developing areas, as the cost to the State was well below the cost to purchase land in the Twin Cities region.

***PROJECT RESULTS USE AND DISSEMINATION***

The Land Trust continued to gain more experience with conservation easements, easement management, and issues unique to protecting land in a metropolitan area. This experience and information was shared with our partner organizations, other easement holders, local communities, and policy makers. The Land Trust also disseminated information about the specific land protection projects completed under this grant though our newsletter, annual report (4,200 pieces), web site, and press releases. Additionally, the MeCC Partnership maintains an interactive public web map that shows the locations of MeCC projects over time. This web map can be accessed at: www.dnr.state.mn.us/maps/MeCC/mapper.html

**Project completed:** 6/30/2015

**2.1 FINAL REPORT - MeCC VI - Restore and Enhance Significant Watershed Habitat - Friends of the Mississippi River ($200,000)**

***Project Outcome and Results***

High quality habitat within the Metro area is important for both resident and migratory species. The

Metro Conservation Corridors partnership is working to establish a system of habitat corridors that also provide open space and water quality benefits for the residents of the area. One goal of this project was to increase the amount of high quality habitat within designated conservation corridors. During this project, FMR installed 86 acres of prairie, besting the projected amount by 31 acres. This prairie restoration took place at the Emrick property, Gores Pool WMA, Heritage Village Park, Pine Bend Bluffs SNA, and Mississippi River Gorge sites. FMR conducted woodland restoration activities on 2 acres at Mounds Park and Heritage Village Park, falling short by 3 acres of the proposed goal. Uncommon flooding at Gores Pool WMA prevented woodland restoration at the site. Activities associated with this restoration included updating management plans, soil preparation, seed/plant installation, mowing, and weed control. These additional acres of natural communities will provide critical habitat for many species that rely on prairie and woodland, some of which are rare or in decline.

A second goal was to enhance the quality of existing habitat areas. We conducted enhancement activities, mostly exotic invasive plant control and burning, on 275.8 acres, exceeding the number of acres committed to in the work program by 172.8.

The third goal achieved was to develop a list of potential future restoration and acquisition projects within the corridors by reaching out to 27 landowners. This outreach has lead to meetings and site visits with landowners interested in learning more about the natural resources on their property. In other cases, the follow up contact is still taking place. This outreach centered around existing conservation areas, including Gores Pool Wildlife Management Area, Mississippi River riparian area, Sand Coulee SNA, Pine Bend Bluffs Natural Area & the Vermillion River.

***PROJECT RESULTS USE AND DISSEMINATION***
FMR organizes many tours and stewardship events at the sites where we conduct restoration activities. We share information about this project with the participants of these events. FMR also occasionally publishes articles in its paper and electronic newsletters regarding restoration projects that it is involved in.

**Project completed:** 6/30/2014

**2.3 FINAL REPORT - MeCC VI - Restoring Our Lands and Waters - Great River Greening ($400,000)**

***Project Outcome and Results***
Along with partners and volunteers, Greening undertook restoration projects to reduce habitat fragmentation, enhance habitat quality, reconnect habitat corridors, and build connections with local communities. Significantly exceeding all of our goals, we:

1. restored/enhanced 191 acres of upland habitat and an additional 192 acres with leveraged non-state funds for a total of 383 acres restored,
2. restored/enhanced 0.26 mile of shoreland habitat and an additional 0.20 mile using leveraged non-state funds for a total of 0.46 miles of restored shoreland,
3. engaged nearly 2,500 volunteers in meaningful parts of these projects, including 700 youth.

Habitats included prairie, oak savanna, woodland, wetland, riparian, and black ash swamp. Sites hosted a total of 14 documented rare species (7 vertebrates, 1 invertebrate, and 6 plant species) (Battle Creek Park, Hidden Valley Park, Katherine Abbott Park, Lake St. Croix Beach, Pilot Knob Hill, Spring Lake Park (Scott Co.), one easement property), and four native plant communities with biodiversity of statewide significance as rated by Minnesota County Biological Survey (Hidden Valley Park, Ike's Creek, Spring Lake Park (Scott Co.), Pond Dakota Mission).

We restored 18 sites using methods such as native species plantings, prescribed burns, and mechanical removal and treatment of invasive species. We restored and de-fragmented habitat along the valleys and banks of the Mississippi and Minnesota Rivers (Heritage Village Park, Battle Creek Park, Pilot Knob Hill, Pond Dakota Mission, Ike's Creek, Valley Park) as well as our Wild and Scenic Rivers (Cedar Creek Conservation Area, Martin's Meadows, five easement properties), and restored prairie/savanna at a site historically connected to Lost Valley Prairie SNA (Central Corridor). We also restored habitat at several ecological cores (Spring Lake Park (Scott Co.), Cedar Lake Farm, Katherine Abbott Park, Freeman Park).

Volunteers planted over 2,400 trees/shrubs and 27,000 forb/grass plugs, and received presentations from a Greening ecologist as part of their workday.

We leveraged a total of $441,000 non-state funds for these projects.

***PROJECT RESULTS USE AND DISSEMINATION***

Volunteer event descriptions acknowledging Trust Fund contributions and qualitative results were emailed to Greening's e-subscribers in July 2011, Feb 2012, July 2012, February 2013, July 2013, and spring 2014 in advance of our spring and fall volunteer event seasons. Over the course of the grants, the number of subscribers increased from about 5,000 to over 6,000.

Information about the Metro Conservation Corridors is on our website in the Initiatives and Volunteer Events sections at http://www.greatrivergreening.org/. Over the course of the grant, the visits to the Greening website increased from approximately 1,200 to approximately 1,500 visits per month.

A summary of results from our partnership with Metro Conservation Corridors was included in email marketing in January 2012, as part of our 2011 annual report, reaching over 5,000 subscribers. Approximately 300 hard copies of the annual report were also distributed.

Two press articles, complete with correct ENRTF acknowledgement, were released during the grant period:

- The Mendota Heights Patch reported in April 2012 on continued restoration at Pilot Knob Historic Site: http://www.greatrivergreening.org/wp-content/uploads/2013/07/4.23.12-Restoration-Continues-at-Pilot-Knob-Historic-Site-Mendota-Heights-MN-Patch.pdf.
- The Isanti County News reported on a fall 2012 Greening volunteer event in the Wild and Scenic Rum River project area: http://isanticountynews.com/2012/10/31/restoration-effort-preserves-20-acres-of-floodplain-forest-along-rum-river/.

An additional five press articles, missing correct acknowledgement despite our efforts, disseminated information about the projects.

- The Bloomington Crow reported in April 2012 on a volunteer event focused on removing invasive species at Ike's Creek: http://www.greatrivergreening.org/wp-content/uploads/2013/07/4.27.12-Chamber-Community-Outreach-Committee-Pulls-Buckthorn-at-Ike-Bloomington-Crow.pdf.
- The Pioneer Press reported on May 3, 2012 on an upcoming volunteer event to remove invasive species and planting prairie seeds at Pilot Knob Hill: http://www.greatrivergreening.org/wp-content/uploads/2013/07/5.3.12-Volunteers-at-Pilot-Knob-Mendota-Heights-Pioneer-Press.pdf.
- The Mendota Heights Patch reported on May 8, 2012 on the same volunteer at Pilot Knob Hill, discussing the work to restore a prairie with a high biodiversity of native plant species:

http://www.greatrivergreening.org/wp-content/uploads/2013/07/5.8.12-Pilot-Knob-Clean-up-Draws-Volunteers-Public-Officials-Mendota-Heights-MN-Patch.pdf.
- The Sun Current reported in June 2012 on a volunteer event and the history of restoration at Ike's Creek: http://www.greatrivergreening.org/wp-content/uploads/2013/07/6.27.12-Bringing-new-life-to-a-Bloomington-Creek-Sun-Current.pdf.
- The Path, a newsletter published by DNR Division of Parks and Trails for its employees, reported in November 2012 on a volunteer event at a DNR Wild and Scenic River easement along the Rum River.See page 4: http://www.greatrivergreening.org/wp-content/uploads/2013/07/12.11.12-DNR-Parks-and-Trails-Internal-Newsletter.pdf.

Greening is in active partnership with landowners, other land managers, service providers, conservation peers, and volunteers resulting in a dynamic and timely exchange of information and results.

**Project completed:** 6/30/2015

**2.6/3.3 FINAL REPORT - MeCC VI - Priority Expansion and Restoration MN Valley NW Refuge - Minnesota Valley National Wildlife Refuge Trust, Inc. ($600,000)**

***Project Outcome and Results***

Activity 1: The Minnesota Valley Trust, Inc. (MVT) acquired 154.6 acres of priority habitat to expand the St. Lawrence Unit of the Minnesota Valley National Wildlife Refuge on January 14, 2015. Of that, 95.1 acres were acquired with the ENRTF grant and 59.5 acres were acquired with other, non-state funds. This property joins two prior acquisitions for this unit, one of which was acquired in part with a prior ENRTF grant (ML2010 - MeCC V Supplemental). The total land acquired for this unit now stands at 445 acres.

About 60 acres of the acquired lands that had been actively-farmed cropland are being restored to its historic alluvial plain and slope wetland habitat with a 2015 Metro Conservation Partners Legacy Grant. This will restore the native wetland habitat with local ecotype vegetation, promote plant diversity to provide a suite of pollinator habitat, prime nesting cover and expanded forage options, and reclaim a unique ecosystem lost to agricultural practices. The project will increase sediment and nutrient entrainment to the Minnesota River, increase water storage and create additional habitat for wildlife, including game species.

Another 3.5 acres were acquired in July 2012 for the nearby Louisville Swamp Unit of the Refuge as leverage, and 176.5 acres were received in donation in December 2011 to create a new Waterfowl Production Area associated with the Refuge. The latter property was just 1 mile outside the corridors of the Metropolitan Conservation Corridors, so does not technically qualify as leverage acres, but was a priority for the Minnesota Valley National Wildlife Refuge & Wetland Management District and is reported here for information purposes.

Activity 2: The following work was completed for this activity:
- Oak savanna remnant at Long Meadow Lake Unit -- Mechanical removal and chemical treatment of woody invasive plant species on 15 acres; prescribed fire on 15 acres; supplemental seeding of native grass and wildflower species on the 15 acres.
- Oak savanna remnant at Louisville Swamp Unit -- Mechanical removal and chemical treatment of woody invasive plant species on 149 acres; prescribed fire on 155 acres.
- Mesic prairie at the Jessenland Unit - Prescribed fire on 300 acres.

***PROJECT RESULTS USE AND DISSEMINATION***
Upon completion of the restoration activities, the St. Lawrence Unit property will be posted open for public use and announced through news releases and the MVT website. Signage at the unit will include reference to the ENRTF.

**Project completed:** 6/30/2015

**2.7/3.7 FINAL REPORT - MeCC VI - Dakota County Riparian and Lakeshore Protection - Dakota County ($1,035,000)**

***Project Outcome and Results***
The project goal was to acquire permanent conservation easements along rivers, streams, and undeveloped lakeshore in Dakota County; prepare Natural Resource Management Plans (NRMPs) for conservation easements; and restore/enhance protected land. The project scope encompassed some of the best natural resource features found in the metropolitan region. A sound fiscal and ecological conservation approach was taken, while attempting to balance the interests, rights and responsibilities of private landowners, with public concerns about water, wildlife habitat, outdoor recreation, and climate change.

In November 2011, the Dakota County Board adopted a comprehensive Land Conservation Vision that included establishing permanent vegetative buffers along all rivers, streams and undeveloped lakeshore and protecting quality natural areas. The County's land conservation programs targeted specific areas in the County and mailings were issued to determine landowner interest. Program applications were reviewed and evaluated using County Board-approve criteria; and top-ranking projects were considered for permanent protection. Appraisals were conducted for recommended projects. NRMPs and baseline Property Reports were prepared for projects where landowners accepted purchase offers; and landowners agreed to cash or in-kind restoration and management contributions. Restoration projects were also completed on existing easement properties.

The project goals were to acquire an estimated 28 permanent conservation easements, totaling 287 acres, and restoring/enhancing 75 acres of protected land. Although the County's efforts generated a large number of potential projects, a wide variety of issues prevented projects from being completed. Landowner challenges included requesting unacceptable project changes during the acquisition process, inflated land/easement value expectations, and reluctance to commit to long-term or even short-term restoration/management. As a result, the County only acquired four conservation easements, totaling 195 acres, not meeting its goal; and completed NRMPs and/or restoration projects on eight properties, totaling 98 acres, which exceeded its goal. Approximately 4 miles of shoreline were permanently protected through this project.

***PROJECT RESULTS USE AND DISSEMINATION***
Information about the specific projects funded through this State appropriation is integrated with information about the County's comprehensive land conservation efforts that were initiated in 1998, with a farmland and natural areas protection plan partially funded by the Environment and Natural Resources Trust Fund. Implementation of the initial plan and subsequent revisions resulted in the permanent protection of 10,362 acres of natural areas and agricultural land and 51.5 miles of shoreland outside of the regional park and greenway system.

This project informed and improved internal and external County land conservation practices, procedures and policies. County staff has provided numerous local, regional and national presentations

about how Dakota County has developed and implemented its successful programs. Information has appeared on TV and radio, as well as metropolitan newspapers and residential newsletters. Information can also be found on the County's web site at:
https://www.co.dakota.mn.us/Environment/LandConservation/Pages/default.aspx

**Project completed:** 6/30/2015

**3.1 FINAL REPORT - MeCC VI - TPL's Critical Land Protection Program - Trust for Public Land ($500,000)**
***Project Outcome and Results***
The Trust for Public Land used Metro Conservation Corridors Phase VI funding to acquire two high quality habitat properties in the Metro Area - Rice Creek Headwaters in Anoka County, and Lindstrom Peninsula in Chisago County.

The Trust for Public Land acquired 343 acres of open space at the headwaters of Rice Creek in the eastern part of Anoka County on December 21, 2012, and conveyed this property to Anoka County on January 3, 2013. This acquisition protected nearly all of the shoreline of Columbus Lake and a half mile of Rice Creek, and has helped to complete public ownership of a 20+ mile conservation corridor along Rice Creek to the Mississippi River. The land provides habitat for many species in conservation need, and has connected large tracts of habitat in Anoka County. Anoka County is managing 258 acres of the land as a new public hunting area called Columbus Lake Conservation Area and the remaining 85 acres has been added to the Rice Creek Chain of Lakes Regional Park Reserve. The Trust for Public Land used $67,000 of its M.L. 2011 MeCC funding, which acquired 14.7 acres, as well as $940,000 from the Outdoor Heritage Fund, which acquired 206.1 acres, and $169,000 from Anoka County, which acquired 37.2 acres, to purchase the 258 acres for the Columbus Lake Conservation Area. The remaining 85 acres of the Rice Creek Chain of Lakes Regional Park Reserve was funded by the Metropolitan Council's Park Acquisition Opportunity Grant Program and Anoka County. Please note that the remaining $10,000 of the appropriated $500,000 from ML 2011 MeCC was released to the MN DNR for their acquisition, reporting and management planning costs as outlined in the Project Budget Summary, and the approved Work Plan.

On October 28, 2014 The Trust for Public Land acquired the 30 acre Lindstrom peninsula and immediately conveyed it to the City of Lindstrom. This 30 acre peninsula will be added to the adjacent 64 acre Allemensratt Natural Area that the City acquired several years ago with partial ENRTF funding. The peninsula contains approximately 5,600 feet of sensitive shoreline and has been added to the existing natural area to be managed as part of the City's park program. This property provides excellent wildlife habitat, water quality benefits and public access in a high growth area. The Trust for Public Land used $423,000 of its M.L. 2011 MeCC acquisition funding and all of its M.L. 2013 MeCC acquisition funding ($395,000) with $82,000 from the City of Lindstrom to purchase the land.

***PROJECT RESULTS USE AND DISSEMINATION***
The Trust for Public Land disseminates information on the TPL website, www.tpl.org, broadcasts emails to Embrace Open Space (EOS) and TPL list serve members, distributes press releases, and includes information in TPL's newsletters and publications as appropriate.

The Columbus Lake Conservation Area is highlighted in The Trust for Public Land's website at:
http://www.tpl.org/our-work/land-and-water/columbus-lake-conservation-area.

Anoka County, with assistance from The Trust for Public Land, developed a press release that resulted in

several newspaper articles about the Columbus Lake Conservation Area/Rice Creek Headwaters project. Links are below.

- http://abcnewspapers.com/2013/01/15/land-protected-for-conservation-in-eastern-anoka-county/
- http://forestlaketimes.com/2013/01/09/anoka-county-adds-350-acres-for-conservation/
- http://www.presspubs.com/quad/news/article_474e24ae-64db-11e2-8700-0019bb2963f4.html
- http://www.startribune.com/local/north/186635221.html

The Lindstrom project is highlighted on The Trust for Public Land's website at: https://www.tpl.org/our-work/our-land-and-water/allemansratt-wilderness-park. The following information has been published about the Lindstrom site:

- http://www.chisagocountypress.com/main.asp?SectionID=1&SubSectionID=1&ArticleID=19566
- http://www.chisagocountypress.com/main.asp?SectionID=1&SubSectionID=1&ArticleID=19627

**Project completed:** 6/30/2015

**3.2 FINAL REPORT - MeCC VI - Protect Significant Habitat by Acquiring Conservation Easements - Minnesota Land Trust ($400,000)**

***Project Outcome and Results***

During the sixth phase of the Metro Corridors project, the Minnesota Land Trust worked with landowners throughout the Twin Cities metropolitan area to permanently protect important lands and Minnesota's remaining natural areas. Three perpetual conservation easements were completed that collectively protected 317 acres of land and more than 4,300 feet of shoreline, exceeding the grant obligations by 167 acres. Two easements were purchased, both as bargain sales; one easement was donated. All three projects were unique opportunities to protect high quality natural habitat and riparian areas. These projects include:

- Sunrise Lake (Chisago County): A 79-acre property of mixed hardwood and conifer forest, wetland, grassland and agricultural field in close proximity to Carlos Avery WMA.
- Tennyson Lake (Isanti County): A 158-acre property of wetlands, mixed hardwood and pine forest, open water, grasslands, and agricultural land, with 4,375 feet of undeveloped shoreline on Tennyson Lake and Spencer Brook.
- Rush River (Sibley County): A 79-acre property of open fields, wooded blufflands, sloping ravines, and lowland forest lying adjacent to the Minnesota River and Rush River County Park.

Baseline property reports were prepared for each easement, detailing the condition of the property for future monitoring and enforcement. LCCMR provided $55,000 in grant funds to the Land Trust's dedicated Stewardship and Enforcement Fund for this required perpetual obligation. $45,000 was for the three new projects under this phase of the Metro Corridors project, while $10,500 was for an easement project from the previous phase of the Metro Corridors project. The Land Trust will report to LCCMR annually on both the status of the Stewardship and Enforcement Fund and the easements acquired with funds through this grant.

Total appraised value for the two purchased easements was $267,000, with the grant providing $209,080; donated value of these bargain sales was $57,920. No appraisal was completed for the donated easement. The cost to the State of Minnesota to complete these projects was $801 per acre. Cumulatively, across all phases of the Metro Corridors program, the Land Trust has protected 3,989 acres of critical habitat and 80,000 feet of shoreline, at a cost to the State of $453 per acre. The Land Trust's work on this project demonstrates the continued cost effectiveness of using conservation easements to protect natural and scenic resources within developed and developing areas, as the cost to the State was well below the cost to purchase land in the Twin Cities region.

***PROJECT RESULTS USE AND DISSEMINATION***
The Land Trust continued to gain more experience with conservation easements, easement management, and issues unique to protecting land in a metropolitan area. This experience and information was shared with our partner organizations, other easement holders, local communities, and policy makers. The Land Trust also disseminated information about the specific land protection projects completed under this grant though our newsletter, annual report (4,200 pieces), web site, and press releases. Additionally, the MeCC Partnership maintains an interactive public web map that shows the locations of MeCC projects over time. This web map can be accessed at: www.dnr.state.mn.us/maps/MeCC/mapper.html

**Project completed:** 6/30/2015

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**Restoration Strategies for Ditched Peatland and Scientific and Natural Areas**
Subd. 04q $200,000 TF

**Michele Walker**
MN DNR
2115 Birchmont Beach Rd NE
Bemidji, MN 56601

**Phone:** (218) 308-2664
**Email:** michele.walker@state.mn.us
**Web:** http://www.dnr.state.mn.us/snas/coniferous_peatlands.html

**RESEARCH**

**Appropriation Language**
$100,000 the first year and $100,000 the second year are from the trust fund to the commissioner of natural resources to evaluate the hydrology and habitat of the Winter Road Lake peatland watershed protection area to determine the effects of ditch abandonment and examine the potential for restoration of patterned peatlands. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
Thirty-seven percent of the naturally stored carbon in Minnesota occurs in a unique ecosystem type called peatlands that covers only 10% of the state. Peatlands form where water levels are near the surface and drainage is poor, which slows decomposition of plant debris and results in an accumulation of these organic materials in a partially decomposed mass called peat. Peatland ecology is largely governed by the water flowing through them and disruption of this flow can have profound impacts on the accumulation of peat, landforms, and vegetation. One peatland located in Lake of the Woods and Roseau counties, the Winter Road Lake Peatland, experienced such disruption in the early 1900's when a failed attempt to drain the lands for agriculture left behind numerous drainage ditches. The Minnesota Department of Natural Resources is using this appropriation to evaluate the effects of this ditching on peatland hydrology and habitat in order to understand options for peatland restoration and possibly create potential for wetland banking credits. Findings will be used to guide restoration strategies for peatlands throughout the state.

**OVERALL PROJECT OUTCOME AND RESULTS**

groundwater and surface water. The Winter Road Peatland Scientific and Natural Area (SNA) is one such peatland. Ditches installed in the early 1900's increased the water flow through this system and altered the peat and the vegetative habitat. The current effect of the ditches was evaluated by monitoring the peatland hydrology (groundwater and surface water) and vegetative habitat over three years at four different sites within the most visually impacted and accessible part of the peatland. In addition, the work was conducted to determine if ditch abandonment will improve the ecological health of this patterned peatland.

The monitoring network consisted of 8 surface water monitoring sites and 39 monitoring wells at 4 sites; A, B, C and D. Vegetation monitoring consisted of 19 releve sites and 8 vegetative transects co-located with the groundwater monitoring sites.

Hydrologic data showed that the ditches were removing water from the peatland and that water was removed faster when water levels were low. In addition, the digging of the ditch created a ditch spoil pile/berm on one side that now acts as a dam to groundwater flow, primarily when placed perpendicular to groundwater flow. This is probably due to the compaction of the peat beneath the berm. Peat sampling also showed that the peat is more decomposed next to the ditches. This is due to the lower water levels next to the ditch allowing the peat to dry out and decompose.

The vegetation data identified 106 different species and showed that within 30 meters of the ditch, the wetland condition is of poorer quality. After 30 meters, vegetation rebounds to more normal wetland conditions with minimal impacts at 100 meters away. The poorer quality wetland near the ditch occurs because the spoil piles raise the ground surface and allow lower quality wetland species to establish. It also is a result of the peat decomposing and drying out near the ditch.

The Natural Resources Research Institute evaluated the data from the monitoring and recommended that a limited approach to restoration be conducted at this time, after evaluation of other restoration sites in progress in the State. Site A should be restored first because it is more remote and will have limited upstream effects. Site A is located in the NNW section of the peatland and within a small lateral ditch just outside of the SNA but within the SNA watershed protection area. Restoration should begin by removing vegetation from the spoil/berm. Ditch blocks should be installed to stop flow from this ditch with subsequent partial removal of the spoil/berm. Continued monitoring is necessary to evaluate the effectiveness of this restoration. Restoration would reduce the risk of invasive species establishment near ditches, provide water-quality improvement, flood attenuation, and increase recreational opportunities.

**PROJECT RESULTS USE AND DISSEMINATION**

Project results will be primarily used to guide restoration of the peatland scientific and natural area as priorities allow. The data will also be used by wetland managers to define negative impact thresholds for wetlands affected by high capacity pumping.

The intention is to publish the data, give presentations to local government units and work with the regional information officer to disseminate the information to the community. The information from this report will be available on the DNR website at:
http://www.dnr.state.mn.us/waters/groundwater_section/publications/restoration_strategies_ditched_peatland_sna.pdf.

Copies of the report have been or will be made available to all the interested parties and land owners including MN DNR (Wildlife and Scientific and Natural Areas), Red Lake Nation, MN Board of Water and Soil Resources, Lake of the Woods County Environmental Director and the U.S. Army Corps of Engineers.

**Project completed:** 6/30/2015

**FINAL REPORT**

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**Subd. 06 Aquatic and Terrestrial Invasive Species**

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**Improved Detection of Harmful Microbes in Ballast Water**
Subd. 06a $250,000 TF

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**RESEARCH**

**Appropriation Language**
$125,000 the first year and $125,000 the second year are from the trust fund to the Board of Regents of the University of Minnesota for the University of Minnesota Duluth to identify and analyze potentially harmful bacteria transported into Lake Superior through ship ballast water discharge. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
Ballast water - water carried in tanks on ships to help provide stability and aid steering - is likely the single greatest source for introduction of non-native and invasive aquatic species. Ballast water is collected in one body of water and discharged into another body of water, usually large distances apart. The recent appearance of a deadly fish virus called Viral Hemorrhagic Septicemia (VHS) in the Great Lakes has raised awareness that some bacteria being transported in ballast water, just like certain plant and animal species, also have the potential to be harmful invasive species. Nevertheless, little is actually currently known about what bacteria are being transported and what can be done to prevent their spread. Biologists at the University of Minnesota - Duluth are using this appropriation to identify and analyze bacteria being transported in ballast water in order to determine which are of greatest concern and to inform strategies for early detection and spread prevention.

**OVERALL PROJECT OUTCOME AND RESULTS**
While the Great Lakes face many threats, the presence of large and small invasive species threatens natural resources, people, and coastal economies. The objective of this project was to identify and evaluate the relative risk of potentially harmful bacterial groups and genes found in commercial ship ballast water that is discharged into the Duluth-Superior Harbor (DSH). Our ultimate goal was to establish a road map that can help direct future work towards higher risk ballast water microbial issues.

To accomplish this goal, ballast water was collected from 16 commercial ships that ply the Great Lakes (i.e., "lakers") containing freshwater ballast water, 10 ocean-going ships (i.e., "salties") containing freshwater ballast water and 2 "salties" containing seawater ballast water in 2011 and 2012. Although there are nearly 1,000 vessel visits per year to this harbor, we collected almost three times as many ballast water samples as expected to create one of the largest repositories of ballast water microbial samples in the Great Lakes.

DNA from portions of these samples was extracted to identify different bacterial taxa while the remaining portions were frozen on membrane filters and stored as a sample repository for future studies. More than 170,000 partial bacterial 16S rDNA sequences were obtained for each sample. All sequence data were screened against two lists of bacterial genera that contain pathogenic bacterial strains. One list contained 20 genera of bacteria that include strains pathogenic to fish or wildlife, and the second list contained 57 genera of bacteria that are potentially pathogenic to humans. DNA from 15 of the 20 bacterial genera harboring fish or wildlife pathogens was detected in at least one ballast water sample. DNA from 37 of 57 bacterial genera that include human pathogens was detected in at least one ballast or harbor water sample. DNA sequences from a few of these bacterial taxa were often more common than DNA sequences from traditional indicator bacteria used for monitoring microbiological water safety.

Two genera containing bacterial strains pathogenic to fish and wildlife (i.e., Tenacibaculum, Piscirickettsia) and one genus containing a human pathogen (i.e., Plesiomonas) were evaluated further because all species within those genera were pathogenic indicating an elevated possibility of introducing a pathogen into the DSH environment. An example of this elevated risk is the bacterium Piscirickettsia, which causes "muskie pox" disease in muskellunge. DNA from this bacterium was found in 25% of the ships sampled, including ships transporting ballast water from Lake St. Clair where Piscirickettsia was found in dead muskellunge during a 2006 fish kill. It was interesting that DNA from Renibacterium species, the causative agent of bacterial kidney disease (BKD) in fish throughout the Great Lakes was not detected in any ballast water sample. Similarly, no DNA sequences related to the ecologically harmful cyanobacerial genera Anabaena and Microcystis were detected in any ballast water or harbor water sample.

Microbes in ballast water may also modify native microbial populations by transferring genes for resistance the effects of antibiotics or the toxic effects of heavy metals. Six unique fosmid libraries containing bacterial metagenomic DNA were created for ship ballast water from Burns Harbor, IN, Hamilton, Ont., Cleveland OH, Detroit, MI and the Atlantic Ocean, and for Duluth-Superior Harbor water. Each fosmid library was screened for resistance to benzylpenicillin, cefotaxime and levofloxacin antibiotics and heavy metals, including cadmium, mercury, and zinc. Ballast water received from ports in larger, more densely populated cities (e.g., Cleveland, OH and Detroit, MI) usually had a larger proportions of microbial antibiotic and heavy metal resistance genes. Receiving ballast water form these harbors should cause greater concern for the spread of these genes to the Duluth-Superior Harbor than receiving ballast water from smaller metropolitan areas (e.g., Burns Harbor, IN). The information generated by this study provided the first step toward assessing the risks and potential impacts of microbial invasions in the Duluth-Superior Harbor and points to directions that warrant further research to develop methods to forecast future invasions.

**PROJECT RESULTS USE AND DISSEMINATION**

Information discovered by this project was disseminated in several ways. Preliminary results of this research were presented to the Duluth Harbor Technical Advisory Committee (HTAC), middle school

teachers and students, Lake Superior Chapter of Muskies, Inc., and discussed with executives of the Lake Carriers' Association and the Great Lakes Maritime Research Institute. Ten research presentations were given to scientists at four regional and national scientific conferences, a Twin Ports Freshwater Folk meeting, and the U.S. EPA Mid-Continent Ecology Division in Duluth. Participants in the project also organized a scientific session on "Tools for Predicting and Managing Current and Future Invasions of Potentially Harmful Species in the Great Lakes" at the 2013 International Association of Great Lakes conference. DNA data housed at the University of Minnesota will be uploaded into national databases for searching and retrieval. This project provided training for a graduate student seeking a M.S. degree and a postdoctoral investigator. A M.S thesis and two scientific publications are being prepared from the results of this research.

**Project completed:** 6/30/2015 [Extended in M.L. 2014, Chapter 226]

**FINAL REPORT** (PDF)

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**Evaluation of Switchgrass as Biofuel Crop**
Subd. 06c $120,000 TF

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**RESEARCH**

**Appropriation Language**
$60,000 the first year and $60,000 the second year are from the trust fund to the Minnesota State Colleges and Universities System for Central Lakes College in cooperation with the University of Minnesota to determine the invasion risk of selectively bred native grasses for biofuel production and develop strategies to minimize the invasion potential and impacts on biodiversity. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
Bioenergy, a form of renewable energy derived from biological sources such as wood or grasses, is becoming an important component of the energy production mix. Native switchgrass is a species that has shown potential as a biofuel crop and efforts have been underway to selectively breed and hybridize it for maximize yield. However, these selectively bred switchgrass varieties also show some potential to be invasive and crowd out native biodiversity, resulting in significant ecological and economic impacts. Scientists at Central Lakes College and the University of Minnesota are using this appropriation to evaluate the invasion risk of selectively bred switchgrass varieties and develop strategies to minimize the invasion potential and impacts on biodiversity. Findings will help support long-term biofuel sustainability.

**OVERALL PROJECT OUTCOME AND RESULTS**
There is concern that native switchgrass bred for bioenergy may become invasive in Minnesota prairies.

This project showed that selecting switchgrass for larger size (biomass) can increase it competitive ability and exacerbate it impacts on other native prairie plants. Switchgrass populations with large seed were more vigorous and produced more biomass leading to larger impacts on prairie diversity. Breeding for small seed size and/or less seed set could mitigate negative effects on prairies. There was a direct tradeoff between biomass production and diversity in a restored prairie, greater biomass was associated with less prairie diversity. Biofuels from switchgrass should use small seeded switchgrass populations to balance production versus diversity goals of prairies. Finally, we determined that poplar buffers can reduce switchgrass biomass 69% and could serve as a management tool in limiting the spread of switchgrass biofuel cultivars.

We conducted 10 experiments in total. In a restored prairie (Ag and Energy Center in Staples, MN) we established 176 1 m2 plots of cultivar and wild switchgrass populations (13 total populations) and monitored them for two or three years. We tested the impacts of switchgrass cultivars in a native prairie at Cedar Creek Ecosystem Science Reserve from 2012-2014 (241 0.64 m2 plots) and 2013-2014 (244 1 m2 plots). Supporting the field studies was a growth chamber test of germination of 12 wild and cultivar populations as well as a greenhouse study testing switchgrass cultivars effects on two native grasses. We also tested poplar buffers and mowing in managing switchgrass from 2012-2014 at the Ag and Energy Center.

Information from this project is being used to inform breeding strategies for reduced invasion risk. We are working with a switchgrass breeder and switchgrass germplasm from our project was re-incorporated into a national breeding program to support the development of cultivars with potentially less invasion risk. Results from this project will support the development of sustainable bioenergy systems in Minnesota that balance biodiversity and production.

**PROJECT RESULTS USE AND DISSEMINATION**
We have presented results from this project for diverse audiences of ecologists, agronomists and conservations including two presentations at the national Ecological Society of America conference (2012, 2013), three presentations for undergraduate interns at Cedar Creek Ecosystem Science Reserve (2012, 2013, 2014), poster presentations for switchgrass breeders and agronomists at the national conference "Switchgrass II" (2013) and Pioneer seed company symposium (2015), and a webinar for the Minnesota DNR - Conservation Science Chat Series (2015).

To date we have published one peer-reviewed paper in Crop Science "Switchgrass population and cold-moist stratification mediate germination" and a second paper is in later stages of revision "Competitive interactions of cultivar and wild switchgrass with native grasses" and will be submitted to Invasive Plant Science and Management. Two additional peer-reviewed papers will be produced from this project.

**Project completed:** 6/30/2015

**FINAL REPORT**

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**Subd. 08 Environmental Education**

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**Minnesota Junior Master Naturalist Program**
Subd. 08b $365,000 TF

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**Appropriation Language**
$365,000 the first year is from the trust fund to the Board of Regents of the University of Minnesota to expand the junior naturalist after-school programs. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

**PROJECT OVERVIEW**
Children are spending increasingly less time outdoors and are often failing to develop an appreciation and connection with nature. This has implications for children's health as well as their knowledge about science, the environment, and the world. In the long term this also impacts the broad public awareness and understanding necessary to ensure long-term protection and stewardship of our environment and natural resources. In order to help reverse this trend the University of Minnesota and the Minnesota Department of Natural Resources are partnering to expand and further develop an after-school program that provides outdoor, science-based educational opportunities for fourth and fifth grade students, particularly in underserved areas, to learn about the ecology and natural history of their schoolyards, neighborhoods, nearby natural areas, and the state.

**OVERALL PROJECT OUTCOME AND RESULTS**
The Minnesota Master Naturalist Explorers program was created to address the problem that children are spending increasingly less time outside and, consequently, know less about their environment and world. It responded to the needs identified in the 2009 Outdoor Education Legislative Report to increase outdoor learning opportunities for children.

The program connected Master Naturalist volunteers with elementary youth in after-school programs to provide hands-on, outdoor activities. The volunteers were recruited by advertising on the Master Naturalist blog and website. Their training took place in 6-hour workshops that covered techniques for working with youth outdoors and in the use of the Explorers' curricula. The curricula are based on the phenology of fall, winter, and spring. Volunteers were provided with the curricula, nature journals, backpacks, pencils, and nametags. They also received supplemental materials to help implement the program including directions for locating a host site, lesson plan aids, and additional worksheets for youth participants. These materials are available at www.minnesotamasternaturalist.org/juniornaturalist.

The Master Naturalist Explorers programs met for 4-8 weeks each, once a week. Each session lasted from one to two hours. Over the course of the program, 90 Master Naturalist volunteers were trained, 29 volunteers led programs at 33 sites across the state, and 482 youth participated.

Several pilot Explorers programs, which were focused on high-needs urban schools offering numerous after-school programs, were cancelled due to low enrollment. Subsequent enrollment efforts were

more successful in schools that had less-developed after-school programs as well as at schools in rural portions of the state.

Many Master Naturalist volunteers who went through Explorers training did not lead multi-week Explorers programs, but reported using the knowledge and curriculum for other activities including church, Scout, and community education programs. Additionally, the volunteers were more likely to lead Explorers programs that were shorter in duration (e.g. 4 weeks).

**Project completed:** 6/30/2015

**FINAL REPORT**

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**Subd. 09 Emerging Issues**

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**Minnesota Conservation Apprentice Academy**
Subd. 09a $200,000 TF

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**Appropriation Language**
$100,000 the first year and $100,000 the second year are from the trust fund to the Board of Water and Soil Resources in cooperation with Conservation Corps Minnesota 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, 2014, by which time the project must be completed and the final products delivered.

**PROJECT OVERVIEW**
Many of the most experienced conservation practitioners at local soil and water conservation districts throughout the state are nearing retirement, and with their departure will go much of their practical, on-the-ground knowledge, experience, and skills. Meanwhile, college students seeking to be the next generation of conservation practitioners have knowledge of emerging technologies and other innovations that can improve and contribute to current conservation efforts. Through this appropriation the Minnesota Board of Soil and Water Resources will work with the Minnesota Conservation Corps to continue an effort that places students in apprenticeship positions with county soil and water conservation district offices throughout the state. This unique program provides an opportunity for interns to gain valuable in-the-field experience from current practitioners while sharing their knowledge with those practitioners about the newest ideas and solutions for meeting today's natural resource challenges.

**OVERALL PROJECT OUTCOME AND RESULTS**

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 professional knowledge and experience to the next generation.

While university 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 alongside seasoned professionals. In turn, apprentices bring knowledge of emerging technologies to improve the quality and productivity of conservation efforts.

This program funded the placement of 35 conservation apprentices in 33 Soil and Water Conservation Districts (SWCD) in 2013, and 37 conservation apprentices in 35 SWCDs in 2014. During this time, the apprentices stabilized erosion on 7.1 million square feet of slopes, planted 69,252 plants, trees, shrubs and seedlings, maintained 3.6 million square feet of restored areas, collected 5,514 water samples, spent 4,272 collecting data and mapping using GPS and GIS, and impacted 2,142 people through environmental education and outreach.

This program has benefits to both students and conservation districts. 96% of apprentices indicated they felt more prepared to work in the conservation industry as a result of the program and would recommend it to others. 96% of the Districts were satisfied with the work their apprentices completed, and 98% indicate they would participate in the program again. Managers also indicated that the work conducted by the apprentices increased the amount of conservation practices delivered by their districts during the program period.

This was the second grant awarded to the Apprentice Academy through LCCMR. Grant one addressed the cohorts working during the summers of 2011 and 2012. The state government shutdown of 2011 produced a small balance in the 2010 grant that was used to fund additional positions in 2012 and 2013; this in turn allowed a small balance in this, the 2011 grant to fund additional positions in the M.L. 2013, Chp. 52, Sec. 2, Subd. 07a plan, and carried funding into the early portion of 2014.

**PROJECT RESULTS USE AND DISSEMINATION**

Information from the project has been disseminated through reports to LCCMR, press releases by BWSR and the Governor's Office, local press releases by SWCDs, and through the Conservation Corps newsletter, website and annual report. Information was used to recruit apprentices and increase awareness of the project.

Communication and outreach activities include the aforementioned reports, press releases, and electronic newsletters. Additionally, BWSR and Conservation Corps staff conducted outreach to SWCDs to find optimal matches between districts and apprentices. Through the course of their work, the apprentices conducted significant outreach to land owners and residents in topics ranging from easement protection, to water quality education, to plant biodiversity.

**Project completed:** 6/30/2015

**FINAL REPORT**