M.L. 2010 Projects Completed 2011-2012

MN Laws 2010, Chapter 362, Section 2

M.L. 2010 Projects Completed 2011-2012

M.L. 2010 Projects
MN Laws 2010, Chapter 362, Section 2 (beginning July 1, 2010)

NOTE: Below are short abstracts for projects funded during the 2010 Legislative Session and ending during 2011-2012. The final date of completion for these projects is listed at the end of the abstract. Final Reports for all completed projects are available at http://www.lccmr.leg.mn/projects/2010-index.html or by contacting the LCCMR office.

Subd. 03 Natural Resource Data and Information
03c Minnesota Breeding Bird Atlas
03d Integrated, Operational Bird Conservation Plan for Minnesota
03h Strategic Planning for Minnesota's Natural and Artificial Watersheds
03j Farmland Conservation in Minnesota

Subd. 04 Land, Habitat, and Recreation
04f Minnesota's Habitat Conservation Partnership Supplemental
04g Metropolitan Conservation Corridors Supplemental

Subd. 05 Water Resources
05f Evaluation of Dioxins in Minnesota Lakes - RESEARCH
05g Assessment of Shallow Lake Management - RESEARCH

Subd. 07 Renewable Energy
07d Demonstrating Sustainable Energy Practices at Residential Environmental Learning Centers (RELCs)

Subd. 08 Environmental Education
08c Connecting Youth with Nature
08h Project Get Outdoors
08k Online Field Trip of Minnesota River

SUBD. 03 NATURAL RESOURCE DATA AND INFORMATION

Minnesota Breeding Bird Atlas
Subd. 03c $372,000

PART 1 ($211,000)
Mark Martell
Audubon Minnesota
2357 Ventura Dr, Ste 106
St. Paul, MN 55125
Phone: (651) 739-9332
Email: mmartell@audubon.org
Fax: (651) 731-1330
Web: http://mnbba.org/

PART 2 ($161,000)

Gerald Niemi
Natural Resources Research Institute (NRRI) - University of Minnesota
5013 Miller Trunk Hwy
Duluth, MN 55811
Phone: (218) 720-4270
Email: gniemi@nrri.umn.edu
Fax: (218) 720-4328

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

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

PART 1: AUDUBON MINNESOTA

Overall Project Outcome and Results
The Minnesota Breeding Bird Atlas is a statewide survey of the breeding distribution of Minnesota's birds. The project combines efforts, coordinated by Audubon Minnesota, of volunteers and multiple partners to obtain detailed information on breeding status of Minnesota's birds, with systematic and habitat based abundance data, coordinated by the Natural Resources Research Institute at the University of Minnesota-Duluth. The combination of these two efforts represents a powerful addition to understanding the distribution, relative abundance, and habitat use by Minnesota's breeding birds.

Over 800 volunteers have participated in the project and have reported over 22,000 hours of donated time. Twenty-nine individuals act as regional coordinators helping to recruit, train, and monitor volunteers. Our database has 207,000 observations on 245 species and confirmed breeding by 226 species around the state. Data has been reported from 5,596 blocks, including 2,166 priority blocks (there is one priority block per township) which gives us data from 92% of the state.

Final products will include a book and on-line atlas, including distribution maps, species breeding status, and conservation and historical information. Products will be available to the public as well as conservation agencies and organizations. Information gathered during this project is at the sub-township level and will provide spatial detail more compatible with contemporary remote sensing imagery available for vegetation, water, and development. Data will be useful to a wide variety of organizations including federal agencies, many state agencies such as the MN DNR and MPCA, county land management agencies, and both regional and local organizations to highlight tourism opportunities. Data will also be of great utility for use in agency decision-making regarding the dedicated funding legislation associated with land acquisition and water quality protection. These types of spatially-intensive data sets are essential to make wiser decisions about land use allocations for energy development, transportation networks, and other residential or industrial development.

Project Results Use and Dissemination
The primary form of information dissemination to date has been through the Minnesota Breeding Bird Atlas website (mnbba.org). Because our data collection is not complete, and we have not subjected all of the data to quality control we have not made efforts to disseminate the information to a wider audience at this time but plan to do so in future efforts.

Project completed: 6/30/2012

PART 2: NRRI

Overall Project Outcome and Results
This project is the third and fourth years of a four-year effort in the development of the Minnesota Breeding Bird Atlas - the first comprehensive assessment of Minnesota's breeding birds. The overall project is divided into two parts: 1) volunteer observations organized by Audubon Minnesota and 2) systematic surveys of Minnesota's breeding birds organized by the University of Minnesota (summarized here). Objectives were to gain uniform statewide coverage for all Minnesota's birds, estimate breeding bird populations by habitat type, and contribute to a nationwide network of bird atlases. Data gathering was primarily completed by graduate and undergraduate students at the University of Minnesota. All passed an aural bird identification test, verified their hearing ability, and participated in field standardization exercises.

Over the two breeding seasons (2011 and 2012) of this project, the target of 40% of Minnesota townships (>920) was successfully completed. Currently, over 80% (>1,800) of the townships have been sampled, with over 230 species observed and over 160,000 individuals counted in over 2,800 individual point counts. Thousands of additional breeding observations were submitted by surveyors from this project to the volunteer database in the complementary study organized by Audubon Minnesota, including over 4,000 probable or confirmed breeding records for Minnesota birds. Over 70% of the data gathered during 2009-2012 have been entered, checked for errors, and briefly summarized.

Project Results Use and Dissemination
The data gathered through 2010 have been downloaded to the Minnesota breeding bird atlas database and during the fall of 2011 through the Cornell University interface. All of these data will be incorporated into a comprehensive atlas of Minnesota's breeding birds that will be used as 1) a first-ever baseline on the current population status of this important Minnesota resource, 2) critical information for future conservation planning, and 3) as a guide for such activities as identifying important bird areas or for nature-based tourism activities. The ultimate dissemination of these data will be through an interactive data system and we anticipate the publication of a hard copy book assuming suitable funding can be obtained.

Project completed: 6/30/2012

Integrated, Operational Bird Conservation Plan for Minnesota
Subd. 03d $151,000

Lee Pfannmuller
Audubon Minnesota
2357 Ventura Dr, Ste 106

St. Paul, MN 55125

Phone: (612) 810-1173
Email: leepfann@msn.com
Fax: (651) 731-1330
Web: http://mn.audubon.org/

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

Overall Project Outcome and Results
Many national, regional, and state conservation plans broadly address Minnesota birds, but a consolidated and focused state conservation agenda does not exist. The goal of this initiative was to develop a clear operational plan for Minnesota conservation organizations and resource agencies that builds on existing plans, establishes priorities to guide conservation actions, and identifies conservation targets. Plans were prepared for Minnesota's four ecological provinces: the Tallgrass Aspen Parklands, the Laurentian Mixed-Forest, the Eastern Broadleaf Forest and the Prairie Parkland. The bird composition of each province is sufficiently distinct to warrant a different approach and different priorities. Three tasks were implemented in each province:

- First Task: Delineated a pool of priority species and selected a subset of conservation target species.
- Second Task: Decided where, among the suite of Minnesota's 48 Important Bird Areas (IBAs), it is most important to work to protect and manage these species.
- Third Task: Developed a toolbox of conservation actions to insure these species maintain viable populations on the priority IBAs, as well as throughout Minnesota.

Titled An Implementation Blueprint for Minnesota Bird Conservation, the operational plan's components include:

1. Implementation Blueprints for Bird Conservation in each ecological province, which identify clear priorities to guide conservation actions;
2. conservation accounts for 78 priority species;
3. detailed Conservation Blueprints for nine target species;
4. a database compiling critical information on 434 Minnesota birds;
5. a publication that highlights twelve of Minnesota's stewardship species (species that have >5% of their global population in the state and >5% of their North American breeding range in the state); and
6. management plans for three of Minnesota's priority Important Bird Areas (Goose Lake Swamp IBA, the Twin Cities Mississippi River IBA, and the Vermillion Bottoms-Cannon River IBA).

Project Results Use and Dissemination

- The Conservation Blueprints were used in the development of Audubon's recently completed Guide to Urban Bird Conservation (Spring 2012): http://mn.audubon.org/twin-cities-bird-conservation.
- A booklet, Stewardship Birds of Minnesota: Our Global Responsibility was published in June 2012.
- Findings were presented at nine workshops and eleven additional statewide and regional meetings.

- The Common Tern Minnesota Conservation Blueprint was used at a Structured Decision Making meeting to inform future Common Tern management at the Rice Lake National Wildlife refuge.
- Audubon is exploring ways to make all project data available to resource managers in a GIS format; in the interim Conservation Blueprints for the nine conservation targets and Implementation Blueprints for each ecological province will be available on the Audubon Minnesota website.
- Information is helping update Minnesota's Comprehensive Wildlife Conservation Strategy.

Project Publication:
Stewardship Birds of Minnesota: Our Global Responsibility (PDF - 6.6 MB)

Project completed: 06/30/2012

Strategic Planning for Minnesota's Natural and Artificial Watersheds
Subd. 03h $327,000

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

Phone: (612) 625-6721
Email: mulla003@umn.edu
Fax: (612) 625-2208
Web: http://www.swac.umn.edu/People/DavidMulla/

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

Overall Project Outcome and Results
Artificial watersheds have significant areas that are drained using ditches and/or buried perforated pipes, leading to hydrologic characteristics that differ from natural watersheds. Water and pollutants from artificial watersheds often disturb the hydrologic regime and impair water quality in natural watersheds. This project aims to protect Minnesota's natural watersheds by disconnecting them from the artificial watersheds.

High resolution digital elevation models (DEMs) from LiDAR and corresponding digital orthoquad photos were obtained in Beauford Creek, Seven Mile Creek and Elm Creek Watersheds. These data were used along with GIS databases for land use, soils, and hydrologic networks to predict the locations of renewable wetlands. In the Beauford watershed (5,500 ac), logistic regression was able to accurately identify 69% of the potentially restorable wetland locations. Most of the error was due to very small wetlands that are difficult to identify using GIS techniques alone. In the Seven Mile Creek watershed (23,500 ac), logistic regression was able to accurately identify 70% of the potentially restorable wetland locations. In Elm Creek (186,600 ac), 94% of the potentially restorable wetlands were identified. These results show that it is possible to quickly and accurately identify a large proportion of larger restorable wetlands over large areas in Minnesota using straightforward terrain analysis techniques, soil databases

and logistic regression.

The optimum locations for restoring wetlands were determined based on factors that included the location and extent of subsurface tile drains, the contributing area to the wetland, the distance between the potential wetland and nearby streams, ditches or county tile mains, the amount of discharge from subsurface tile drains to wetlands, and the ratio of drainage flow to wetland storage capacity. Using these criteria, 44 optimal sites for wetland restoration were identified in Beauford Creek watershed, while 75 sites were identified in Seven Mile Creek watershed. Placing wetlands at these locations is optimal in terms of intercepting, treating and reducing the effects of subsurface tile discharge to nearby drainage ditches.

More efficient approaches for processing LiDAR DEMs were developed using a supercomputer. The new methods run much faster than conventional methods for processing LiDAR DEMs on a personal computer. Terrain attributes for DEMs (e.g. slope, flow accumulation, stream power index, compound topographic wetness, etc) were calculated for all 42 Minnesota counties that have LiDAR data. We are exploring the possibility of using the Minnesota Geospatial Information Office web site to disseminate these LiDAR based terrain attributes.

Project completed: 06/30/2012

Farmland Conservation in Minnesota
Subd. 03j $100,000

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

Phone: (651) 223-5400
Email: jjambor-delgado@flaginc.org
Fax: (651) 223-5335
Web: http://www.flaginc.org/

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

Overall Project Outcome and Results
The report that resulted from this project - "Preserving Minnesota's Agricultural Land: Proposed Policy Solutions" - recommends a new statewide approach to preserving our state's diminishing agricultural lands to ensure that our state's best farmland is preserved. The state's prime farmland - that most well suited for farming - has been developed at a steady rate, with significant negative consequences for the security and stability of our natural resources and food supply.

The report notes that existing state farmland preservation programs can be invaluable tools for the

immediate and short-term preservation of farmland, but they have not successfully preserved farmland for the long-term because they suffer from poor incentives and limited promotion. State land use planning requirements could facilitate farmland preservation, but Minnesota's fail to because they do not require local governments to address farmland preservation in their comprehensive plans or zoning ordinances.

Among the report's recommendations are:

- Adopt state farmland preservation goals and a statutory requirement for comprehensive plans and zoning ordinances to include farmland preservation plans.
- Develop a statewide Purchase of Agricultural Conservation Easement (PACE) program to be offered in counties with farmland preservation plans. Include soil and water conservation and stewardship plans in the easements. Consider building upon Dakota County's PACE program, which explicitly joins farmland protection with water quality protection.
- Streamline the Metro and Greater Minnesota Programs into one comprehensive state program administered by the Minnesota Department of Agriculture. Make the program available in all counties with farmland preservation plans.
    - Tiered incentives should be used to promote conservation and long-term protection.
    - Add a permanent and a 30-year agricultural preserve option.
    - Require preservation of similar quantity and quality of farmland to acquired farmland when enrolled land is acquired though eminent domain or annexation.
- Make all working farms, including small-acreage farms, eligible for Green Acres program benefits. Farms most affected by existing size restrictions are Community Supported Agriculture farming operations, beginning and immigrant farmers, small-scale diversified farms, direct marketers, and farms that raise grass fed livestock or that allow animals to forage. Current restrictions result in excluding farms using production methods that are better for the environment and thwarts economic development by denying benefits to burgeoning small-scale farming operations.
- Develop policies and allocate resources to help to facilitate the transfer of land from one generation of farmers to the next and allow for affordable access to good quality farmland. Consider adopting a tax credit for those who lease land to beginning farmers; conservation measures could be made a required component of such leases.

Project Results Use and Dissemination
The report has been distributed to a regional media list; federal, state, and local public officials and staff; farm organizations; and influential farmers and other citizens. The report's contents (and a link to the report online) has also been distributed to almost 3,000 contacts. Plans are underway for any follow up strategies farm organizations may pursue in the legislative sessions ahead.

Project Publication:
Preserving Minnesota's Agricultural Land: Proposed Policy Solutions (PDF - 8.3 MB)

Project completed: 06/30/2012

SUBD. 04 LAND, HABITAT, AND RECREATION

Minnesota's Habitat Conservation Partnership Supplemental
Subd. 04f $1,344,000

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

Phone: (612) 532-3800
Email: jpavelko@pheasantsforever.org
Fax: (320) 354-4377
Web: http://www.mnhabitatcorridors.org

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

Project Overview
With continued land use changes in Minnesota, areas that once served as important areas for fish, wildlife, and plant habitat have become fragmented and disconnected resulting in adverse impacts on these ecological communities. Strategic and coordinated efforts in protection, restoration, and enhancement of lands throughout Minnesota can create land and water corridors that reconnect remaining habitat areas and reverse some of the adverse impacts. This appropriation represents a supplement to the sixth phase of an ongoing effort by a partnership of state, federal, and non-profit organizations to do such strategic and coordinated land protection, restoration, and enhancement. Earlier phases of this project have resulted in the protection, restoration, or enhancement of more than 100,000 acres throughout the state. Many of these projects matched Trust Fund money with non-state funds, stretching these dollars to provide a greater benefit to the state. This supplemental funding to Phase VI of this effort involves nine partners and is expected to result in the permanent protection of

nearly 200 additional acres and restoration or enhancement of approximately 1,900 additional acres. Projects from the individual partners are listed below.

Project completed: 6/30/2012

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

2d - HCP VI Supplemental - Shallow Lake Assessment and Management - MN DNR ($45,000)
2f - HCP VI Supplemental - Shallow Lake Habitat Enhancement and Wild Rice Enhancement and Monitoring - Leech Lake Band of Ojibwe ($50,000)
2h - HCP VI Supplemental - Fisheries Habitat Restoration - MN DNR ($100,000)
2k - HCP VI Supplemental - Prairie Management - MN DNR ($63,000)
2n - HCP VI Supplemental - Campaign for Conservation - Restoration - The Nature Conservancy ($164,000)
2o - HCP VI Supplemental - Working Lands Partnership - Friends of the Detroit Lakes Wetland Management District ($45,000)
2p - HCP VI Supplemental - Bluffland Restoration - National Wild Turkey Federation ($50,000)
3a - HCP VI Supplemental - Shoreland Protection Program - Minnesota Land Trust ($102,000)
3c - HCP VI Supplemental - Shallow Lake Easements - Ducks Unlimited, Inc. ($75,000)
3d - HCP VI Supplemental - Wetland Reserve Program - Ducks Unlimited, Inc. and USDA Natural Resource Conservation Services ($350,000)
4b - HCP VI Supplemental - Fisheries Land Acquisition - MN DNR ($100,000)
4c - HCP VI Supplemental - Critical Lands Protection Program - Trust for Public Land ($200,000)

2d FINAL REPORT - HCP VI Supplemental - Shallow Lake Assessment - MN DNR ($45,000)

Overall Project Outcome and Results

The Minnesota Department of Natural Resources (DNR) is working with Ducks Unlimited (DU) and other partners in a focused, strategic approach to assess, improve and protect the aquatic ecology and water quality of shallow lakes for waterfowl and other wildlife. Shallow lakes are a critical component of the wetland habitat complexes once common to Minnesota landscapes. These lakes provide the migration, brood rearing, and hibernacula critical for shorebirds, waterfowl, water birds, turtles and amphibians. Through this grant, and the existing shallow lake program, DNR will provide the predesign habitat assessment and monitoring of shallow lake structural enhancements accomplished by DU through bioengineering. There were 15 shallow lake assessments planned to be completed with this grant. There were actually 11 shallow lake habitat assessments completed with a combination of DNR and ENRTF funding. All of the assessments were completed within the Habitat Conservation Partnership Project Area 3. The information collected will be used to inform lake management strategies including DU lake structure enhancements and DNR accelerated management activities. Assessments included data collection on water depths, aquatic vegetation, water clarity, and water chemistry. Lakes were selected from a priority list developed by the MN DNR shallow lakes program. The reason for the shortfall was related to the conversion of the state accounting system to SWIFT and the consequent difficulty in locating and coding to the proper account.

Project Results Use and Dissemination

Accomplishment Reports and press releases will be made available at http://www.mnhabitatcorridors.org.

Project completed: 6/30/2012

2f FINAL REPORT - HCP VI Supplemental - Shallow Lake Habitat Enhancement and Wild Rice Enhancement and Monitoring - Leech Lake Band of Ojibwe ($50,000)

Overall Project Outcome and Results

The goal of this project was to improve habitat for waterfowl and other species that utilize wetlands on the Leech Lake Reservation in addition to analyzing a long term wild rice data set to determine if waterfowl numbers are influenced by rice abundance. A number of techniques were utilized to accomplish this work.

Waterfowl habitat enhancements, over the period of this grant, were conducted on seven impoundments that are located throughout the reservation and covered approximately 300 acres. On these impoundments water levels were managed and dike and control structures were repaired and maintained. Beaver plugging is also an issue on many of these impoundment so dam material was removed as needed, Clemson Levelers were installed, and in some cases beaver removal was utilized to control the problem. Water draw downs were also accomplished on two impoundments to restore aquatic vegetation.

A second aspect of this project was to enhance waterfowl food supply by planting wild rice. Wild rice has been degraded in some locations due to inappropriate water levels, damage from wind storms, and human activities. Two hundred acres of water was reseeded with rice during the course of this grant period.

The third aspect of this project was to scan, and rectify the first seventeen years of aerial wild rice bed images that have been taken of major rice beds on the Reservation. A subset of this data was then analyzed and compared to waterfowl abundance data provided by the MN DNR to see if a positive correlation between rice abundance and waterfowl numbers could be identified. The work thus far completed has not been able to detect a significant relationship between rice abundance and waterfowl numbers, but we will continue this work on a larger data set looking at more parameters to see if one exists. The largest benefit from this work has been the development of the methodology to analyze rice distribution and abundance from aerial photographs that will be helpful for us and other resource personnel to manage wild rice into the future.

Project Results Use and Dissemination

The methodology and techniques used to quantify wild rice beds from aerial photographs will be available to other resource managers if they would like to use them to evaluate their rice beds.

Project completed: 6/30/2012

2h FINAL REPORT - HCP VI Supplemental - Fisheries Habitat Restoration - MN DNR ($100,000)

Overall Project Outcome and Results

Citizens of the state of Minnesota benefit from this project by having a better fish community structure in Hartley and Long Lake that is sustainable by natural reproduction. This then creates better fishing and recreation available in high priority waterbodies. The project was completed on June 30, 2011. The project consisted of seven step-pools that started at the dam and went down stream approximately 230 ft. In addition four stop-log bays on the dam were modified to allow fish passage. The public have reported seeing fish using the pools to move into Hartley Lake and Long Lake. In July 2011, heavy rains created high waters and resulted in some of the organic fill being washed out. The lake association is going to work with staff to repair the damage. Long term maintenance of this project is going to be

shared with the local lake association.

Project Results Use and Dissemination
Information on HCP project results have been shared and disseminated through all partner organizations. The Environment and Natural Resources Trust Fund provides information to the general public on how the lottery funds are spent for natural resource activities.

Project completed: 6/30/2012

2k FINAL REPORT - HCP VI Supplemental - Prairie Management - MN DNR ($63,000)
Overall Project Outcome and Results
A total of 127 acres of invasive species were controlled during the project (69 acres of woody removal, 58 acres of herbaceous invasive species treatments). Invasive tree species controlled includes Buckthorn, Siberian elm, Red cedar and Boxelder. Herbaceous invasive species treated include Spotted Knapweed, Leafy Spurge, and Crown-vetch. Projects were implemented by both private contractors and DNR crews. A total of 197 acres were burned on 2 SNA's and 2 Native Prairie Banks during the reporting period. All burns were completed by DNR crews as it remains difficult to hire qualified prescribed fire contractors. A total of 15 acres were reconstructed on the Langhei SNA and Mickelson Native Prairie Bank. All seeds were collected on the projects sites, and every attempt was made to collect a diversity of seeds. Both reconstructions are adjacent to native prairie; one reconstruction was a former row-crop field, and the other a site previously disturbed by installation of underground utilities. Data collection occurred on 4 different management projects. The data was loaded into the SNA Program's Adaptive Management Spatial Database (AMSD) for analysis and permanent documentation. Projects monitored included invasive species treatments and prescribed burning. As additional SNA management actions are implemented, and the data sets grow larger, AMSD will prove to be a valuable tool for continuous improvement of management methods.

Project Results Use and Dissemination
Accomplishment Reports and press releases will be made available at http://www.mnhabitatcorridors.org.

Project completed: 6/30/2012

2n FINAL REPORT - HCP VI Supplemental - Campaign for Conservation - Restoration/Acquisition - The Nature Conservancy ($164,000)

Overall Project Outcome and Results
The Nature Conservancy's (TNC) 2010 ENRTF appropriation focused on habitat restoration/enhancement in critical corridors and landscapes identified by TNC and the Habitat Conservation Partnership. This program allowed us to significantly accelerate our work to maintain and enhance Minnesota's prairies, savannas, and wetlands using prescribed fire and surveying/treating invasive species. Other efforts focused on restoring sand prairies and long-lived conifers in landscapes where these are threatened. Our goal in this phase was to restore 2,415 acres. We were able to complete work on 3,178 acres, including:

1. 2,529 acres of prescribed fire was planned/implemented at 15 sites in the Northern Tallgrass Prairie and prairie-forest transition areas of Minnesota.
2. 533 acres of invasive species were treated at 15 sites in the same areas.

3. 75 acres of white pine and other long-lived conifers were replanted in forests along the North Shore.
4. 41 acres of sand prairie were restored in Southeast Minnesota.

Not included in these totals, but still valuable, were preparations for future prescribed burns on 240 acres and surveys for invasive species on over 7,000 further acres. Both will contribute to future conservation results. In addition, this support from the Environment and Natural Resource Trust Fund allowed TNC to bring an additional $54,284 in private and non-state public dollars for conservation work in these critical places.

Project completed: 6/30/2012

2o FINAL REPORT - HCP VI Supplemental - Working Lands Partnership - Friends of the Detroit Lakes Wetland Management District ($45,000)

Overall Project Outcome and Results

This project funded the restoration of thirty-three wetlands totaling approximately seventeen acres on two Waterfowl Production Areas (WPAs) in Becker County. These areas are managed by the USFWS's Detroit Lakes Wetland Management District office. The primary objective was to restore small seasonal wetlands on WPAs. These small wetlands are important because they are the first to melt in the spring, providing critical habitat to early arriving migrating birds. Research has also shown that these types of wetlands have some of the highest invertebrate densities, a critical food source for egg-laying hens and fast-growing ducklings. These wetlands also play a role in flood protection in the Red River Valley. Because they are temporary or seasonal wetlands, they are often dry during the late fall. During snow melt the following spring, they are able to capture their full volume of water. Wetland restoration in western Minnesota is becoming increasingly important under several climate change models. First, these models predict increased flooding in the future. Second, the models predict that the climate of central Dakotas, the duck factory, will shift to western Minnesota. Wetland restoration in Minnesota buffers us against current and future flooding as well as the possible future waterfowl and songbird production in the Central Flyway.

Project Results Use and Dissemination

We are currently drafting a press release for local television and newspapers to discuss all of the grant funded projects in this area, including both ENRTF and LSOHC-CPL funded projects. However, due to the business of the pre-Xmas season, we will probably wait until mid-January before contacting these media. We have had informal conversations with newspapers in the area and they are interested in doing a story on the habitat restoration work in this area.

Project completed: 6/30/2012

2p FINAL REPORT - HCP VI Supplemental - Bluffland Restoration - National Wild Turkey Federation ($50,000)

Overall Project Outcome and Results

This project was part of a long-term bluffland restoration effort by DNR, National Wild Turkey Federation, and private landowners in SE MN. Funds from the Environment and Natural Resources Trust Fund were used to hire contractors to remove Eastern red cedar, buckthorn, honeysuckle, and prickly ash that was growing over former "goat prairies". The project focused primarily on improving habitat for the timber rattlesnake, three other at-risk snake species (racer, bullsnake, and hognose snake) and numerous at-risk plant species in the Bluffland subsection.

Goat prairies are native prairies found on steep south-facing hills in southeastern Minnesota. They are important to wildlife because the wind prevents deep snowpack, and intense sunlight melts much of what does stick. Animals can then rest and forage on the exposed sites. Nearby rock bluffs hold snakes, which forage in the prairies in summer. These prairies were historically maintained by periodic wildfire, but fire prevention has allowed native red cedar and non-native brushy species to encroach on them. These need to be removed to restore the native habitat. Restoring vegetation through these methods also reduces soil loss and improves water quality within the watershed.

During this grant period we treated 29.2 acres of habitat on private lands by hand cutting the invasive overstory. Stumps were treated with herbicides to prevent re-sprouting. Cut material was piled and burned on-site. A ten-year agreement was required from the landowners before any work began. The level of brush infestation, location and access impacted the contract price, which in turn led to lower than anticipated accomplishment acreage. The treatment area was 28 acres rather than the anticipated "up to 45 acres" as indicated in the initial plan. A second site was added later and an additional 1.2 acres treated. Periodic prescribed burning will be conducted by DNR (non-Trust-Fund monies) and will maintain the site in the desired habitat state.

Project Results Use and Dissemination
Accomplishment Reports and press releases will be made available at http://www.mnhabitatcorridors.org.

Project completed: 6/30/2012

3a FINAL REPORT - HCP VI Supplemental - Shoreland Protection Program - Minnesota Land Trust ($102,000)

Overall Project Outcome and Results
This 2010 grant was supplemental to the sixth phase (2009) of our Shorelands Protection project. This grant provided acquisition capital needed to complete two urgent projects that otherwise we would not have been able to complete. One project protects important shoreline along Lake Superior, while the other project protects shoreline along the Little Pine River. Collectively, these two easements protect 99 acres of critical habitat and protect more than 7,000 feet of fragile shoreline.

Both easements were purchased at significant bargain prices. One of the projects (Lake Superior) also used some 2009 funding, so project details, including the funding breakdown, also were reported in our 2009 (Phase 6) final report.

Additionally, the Land Trust prepared baseline property reports for each easement, detailing the condition of the property for future monitoring and enforcement. To fund this required perpetual obligation, the Land Trust dedicated funds to its segregated Stewardship and Enforcement Fund for several completed projects. For these projects, we estimated the anticipated annual expenses of each project and the investment needed to generate annual income sufficient to cover these expenses in perpetuity - all in accordance with our internal policies and procedures as approved by LCCMR. We will report to LCCMR annually on the status of the Stewardship and Enforcement Fund and the easements acquired with funds from this grant.

An appraised value is known for only one of the easements. The donated value of this easement is $515,000. Based on the estimate of value for the second easement, we believe the donated value of that easement is approximately $53,000. Therefore, we were able to leverage significant private

donation with the State's small investment in these projects.

Cumulatively, across all phases of the HCP program, the Land Trust has protected 7,549 acres of critical habitat and nearly 224,000 feet of shoreline, at a cost to the State of $293 per acre.

The Land Trust's work on this project continues to demonstrate the cost effectiveness of working with conservation easements to protect natural and scenic resources along Minnesota's lakes, rivers, and streams, as the cost to the State was well below the cost to purchase land along our increasingly threatened shorelines. This grant continued to generate interest among landowners, and therefore, ongoing funding will be important to sustained success. Additionally, we believe that funds to purchase easements - even a small incentive - will be necessary in the future as work becomes more targeted, selective, and focused on building complexes of protected land.

Project Results Use and Dissemination
The Land Trust disseminated information about the specific land protection projects completed under this grant though our newsletter, email updates, web site, and press releases. The Land Trust also shared information about conservation easements generally and our experience with our partner organizations, other easement holders, local communities, as well as policy makers including members of the LCCMR and LSOHC.

Project completed: 6/30/2012

3c FINAL REPORT - HCP VI Supplemental - Shallow Lake Easements - Ducks Unlimited, Inc. ($75,000)
Overall Project Outcome and Results
Ducks Unlimited used this grant in combination with our 2009 appropriation to help fund approximately 40% of the cost to purchase a permanent conservation easement on the 150-acre Donovan-Posch property on Garden and Johnson Lakes in Crow Wing County in June 2011. In addition, Ducks Unlimited also provided technical assistance and conducted outreach and promotion of conservation easements as a land protection option to new landowners on several shallow lakes, and secured appraisals for potential conservation easements on both the Papenheim and Douglas County Land Company properties on Lake Christina, and ordered an appraisal on the Radunz property on Cedar Lake in Meeker/McLeod County under this grant before funds ran out. Negotiations with these and other landowners are ongoing and will continue in the future through our 2011 appropriation. DU spent $29,639 in Other Funds to complete this project.

Project Results Use and Dissemination
This grant helped DU continue the protection of shallow lakes by working with private landowners to secure conservation easements and promote conservation easement concepts. Conservation easements with private landowners are sensitive land deals that don't lend themselves to widespread publicity. However, DU has recognized individual landowners and has publicized our work to protect shallow lake shorelines and shoreland locally through local conservation groups, soil and water districts, and tribal organizations supportive of our work to protect wild rice lakes. DU also informed the foundations supporting our Living Lakes Initiative of our conservation accomplishments. The accomplishment of securing two new permanent conservation easements through this grant has helped encourage other private landowners to consider working with DU to protect their shorelines, and news of our progress may be further disseminated through DU news releases and articles DU publications in the future. Accomplishment Reports and press releases will be made available at http://www.mnhabitatcorridors.org.

Project completed: 6/30/2012

3d FINAL REPORT - HCP VI Supplemental - Wetland Reserve Program - Ducks Unlimited, Inc. and USDA Natural Resource Conservation Services ($350,000)

Overall Project Outcome and Results

In partnership with the USDA's Natural Resources Conservation Service (NRCS), Ducks Unlimited (DU) contracted with seven Wetlands Reserve Program (WRP) wetland technicians from November 2010 through November 2011 as part 3d of the Habitat Conservation Partnership (HCP) Phase 6.5 "Supplemental" grant. Grant funds were used in combination with private DU funds and federal USDA funds provided by the Natural Resources Conservation Service (NRCS) to contract for the professional services of these seven technicians, whose function was to provide technical assistance to private landowners and USDA - NRCS complete applications and enroll new lands into the WRP, and to help USDA-NRCS and private landowners plan, design, and implement restoration measures on lands previously enrolled in the WRP. The delivery goal for these technicians was to provide Technical Assistance (TA) to help NRCS protect 1,000 acres through new WRP easements and help restore wetlands and associated upland habitat on WRP easements in HCP project areas at an estimated Other Funds cost of $1,520,000 to NRCS. During the life of this grant, the contract specialists made 900 landowner contacts, prepared and submitted 122 applications, submitted 156 easement restoration plans or plan modifications, completed 7 wetland restoration designs, and provided field level management and oversight of 64 restoration projects. Meanwhile, during this grant period, NRCS spent $6,222,501 of federal other funds to close 50 WRP easements protecting 5,252 acres. DU and NRCS also spent an additional $463,127 to pay specialists and administer this grant, for a total non-state Other Funds investment of $6,685,628 during this grant period, significantly more than our estimated proposal goal of $1,520,000.

Project Results Use and Dissemination

Information on the WRP signups has been publicized through news releases from the USDA's NRCS and local Soil and Water Conservation Districts, and through hundreds of individual landowner contacts made by DU wetland restoration specialists. Additional announcements and landowner contacts continue to be made and publicized by DU and USDA's NRCS.

Project completed: 6/30/2012

4b FINAL REPORT - HCP VI Supplemental - Fisheries Land Acquisition - MN DNR ($100,000)

Overall Project Outcome and Results

This project focused on the acquisition of Preece Point AMA, one of the most prominent geographic features on Lake Marquette - a Mississippi River headwaters lake. Here the lakeshore forms a long, narrow point, which is visible from virtually everywhere around the lake. The entire property along with it's associated aquatic habitat is unimpacted by human activities. This AMA will now provide walk-in access to a lake that has no developed public access. The property was sold to DNR as a bargain sale, and the family is happy to know that it will be preserved in it's natural state.

Project goals were to protect 20 acres (0.3 miles of lake and stream shoreline) with the help of partner and other state funding. Partner funding includes donations of land value and cash.

This project resulted in a grand total of approximately 11.8 acres and 0.2 miles of lake and stream shoreline. Environmental and Natural Resources Trust dollars directly acquired approximately 5.9 acres

of the total, including 0.1 mile of lake shoreline. Donations of land value and cash ("other funds" $50,000) and other state monies ($50,000) leveraged with trust dollars totaled $100,000. These contributions helped acquire the remaining acres of the grand total, including 2.94 acres and 0.05 shoreline miles using other state dollars and 2.94 acres and 0.05 shoreline miles from donations of land value and cash. Preece Point was acquired jointly using both 2009 and 2010-Supplemental grants to Minnesota's Habitat Conservation Partnership - Fish and Wildlife Acquisition (4b). Results for Preece Point were proportionately distributed for each grant.

As a result of the combined 2009 and 2009-supplemental grants, 17 acres, including 0.3 miles of critical fish and wildlife habitat are now permanently protected and open to public angling and other light use recreational activities on Preece Point AMA. Acquired parcels are now designated and managed as Aquatic Management Areas (AMAs).

Project Results Use and Dissemination
Accomplishment Reports and press releases are available at www.mnhabitatcorridors.org., and all AMAs will be added to DNR's Public Recreational Information Maps (PRIM).

Project completed: 6/30/2012

4c FINAL REPORT - HCP VI Supplemental - Critical Lands Protection Program - Trust for Public Land ($200,000)
Overall Project Outcome and Results
On September 30, 2011, the Trust for Public Land (TPL) acquired 510 acres in Le Sueur County containing high-quality wetlands and 1.64 miles of naturally flowing Cannon River just upstream from a concentration of rare freshwater mussels. TPL immediately conveyed the property to the Department of Natural Resources (DNR) who will manage the land as a new Wildlife Management Area ("Dora Lake WMA"). In addition to conserving a large area of Minnesota County Biological Survey (MCBS)- identified native habitat, acquisition of these tracts provides an opportunity to restore approximately 200 acres of tilled land in a sensitive water quality area. The DNR will restore them to wetlands, grassland and eventual guided succession to Big Woods. Protection of the property ensures habitat for fish, game and wildlife in the Cannon River watershed.

Project Results Use and Dissemination
Accomplishment Reports and press releases about the overall Habitat Conservation Partnership are available at www.mnhabitatcorridors.org.. Information about this acquisition and the Cannon River Headwaters Habitat Complex effort will be posted on TPL's website: www.tpl.org. Information about the Cannon River Headwaters Habitat Complex effort has also been disseminated through its network of supporters which include: the Cannon River Watershed Partnership, the Tri-Lake Sports Club, the Dark House Anglers Southern Chapter, Minnesota Deer Hunters Association South Central Prairieland Bucks Chapter (Le Sueur, Rice, Waseca, and Steele Counties), Waterville Sportsman's Club, Montgomery Sportsmen's Club, Minnesota Waterfowl Association Scott- LeSueur Chapter, the Izaak Walton League Owatonna Chapter, and the Minnesota Department of Natural Resources.

Project completed: 9/30/2011

Metropolitan Conservation Corridors Supplemental
Subd. 04g $1,750,000

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

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

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

OVERALL PROJECT OUTCOMES AND RESULTS
During this supplemental grant to the fifth phase of the Metro Corridors project, the Metro Conservation Corridors Partners continued their work to accelerate protection and restoration of remaining high-quality natural lands in the greater Twin Cities Metropolitan Area by strategically coordinating and focusing conservation efforts within a connected and scientifically-identified network of critical lands. This corridor network stretches from the area's urban core to its rural perimeter, including portions of 16 counties.

This supplemental phase was focused on unique opportunities that were not funded through prior phases of the MeCC program. This supplemental phase included only four of the MeCC partners and accomplished work in two specific result areas.

1. Restore and Enhance Significant Habitat: Partners restored and enhanced a total of 133 acres of significant habitat in the Lower Minnesota River Watershed using Phase V Supplemental funding plus an additional 33 acres with other funds.

2. Acquire Significant Habitat: Partners protected 494 acres of land through acquisition of fee title and conservation easements and leveraged an additional 454 acres of land using other funds.

Since 2003, MeCC partners have protected more than 10,000 acres and restored nearly 8,000 acres. These strategic and coordinated efforts address a number of recommendations of the Statewide Conservation and Preservation Plan, including, protecting priority land habitats, protecting critical shorelands of streams and lakes, restoring land, wetlands, and wetland-associated watersheds, and improving connectivity and access to outdoor recreation.

OVERALL PROJECT RESULTS USE AND DISSEMINATION
As projects were completed, the individual partners were encouraged to publicize accomplishments through press releases, organization newsletters and websites. These efforts resulted in information being distributed to the public through websites, email lists, daily and weekly newspapers, newsletters, and other print materials. Additionally, 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: http://www.dnr.state.mn.us/maps/MeCC/mapper.html.

Project completed: 6/30/2012

ABSTRACTS AND FINAL REPORTS OF INDIVIDUAL PARTNER PROJECTS (Click project # to go to listing for that project)
2.4 - MeCC V Supplemental - Lower Minnesota River Watershed Restoration and Enhancement Friends of the Minnesota Valley ($50,000)
3.1 - MeCC V Supplemental - Critical Land Protection Program - Trust for Public Land ($890,000)
3.2 - MeCC V Supplemental - Protect Significant Habitat by Acquiring Conservation Easements - Minnesota Land Trust ($485,000)
3.3 - MeCC V Supplemental - Minnesota Valley National Wildlife Refuge Fee Title Acquisition - Minnesota Valley National Wildlife Refuge Trust, Inc. ($325,000)

2.4 FINAL REPORT - MeCC V Supplemental - Lower Minnesota River Watershed Restoration and Enhancement - Friends of the Minnesota Valley ($50,000)
Project Outcome and Results
Friends of the Minnesota Valley (FMV) undertook restoration of habitat for the Lower Minnesota River Watershed portion of the Metropolitan Conservation Corridors Project (MeCC) as a continuation of our wildlife habitat restoration within the Minnesota Valley National Wildlife Refuge and Wetland Management District (Refuge) and within the Lower Minnesota River Watershed.

The Friends' objectives were to complement and connect habitat restoration and management of Refuge lands with that being done by other entities. Project sites addressed the need to restore hydrology within floodplain communities and to restore upland communities such as native oak savanna and wet and dry prairies, resulting in the rehabilitation of nesting, breeding, and brood-rearing habitat for migratory waterfowl in wetland areas and habitat for four documented species in upland areas. Due to late and persistent flooding, our access to the wetland site was prohibited and, as a result, we shifted our focus to upland restoration, as described in our amended work program.

FMV and our partners were able to successfully restore and enhance 30 acres of native wet prairie, 74 acres of native dry sand-gravel oak savanna, and 29 acres of native dray sand-gravel prairie with LCCMR funds during MeCC Phase V Supplement for a total acreage of 133 acres. We also restored additional match acreage of 14 acres of native dry sand-gravel oak savanna and 9 acres of native dry sand-gravel

prairie with non-LCCMR, non-state funds. All work was completed on four Refuge Units and included cutting and herbicide treatment of non-native woody brush species such as buckthorn, honeysuckle, prickly ash, eastern red cedar, and Siberian elm. Our project data is publicly accessible by contacting the Friends, through information disseminated through our newsletter which is distributed to our 1,200 active members, our annual report, on our website, and through information provided by the MeCC Partnership.

Project Results Use and Dissemination
As projects were completed, Friends of the Minnesota Valley publicized project accomplishments through the Friends' quarterly newsletter, our annual report, and the posting of project information on our website. Other dissemination of information occurred through the Metro Conservation Corridors partnership and on the Metro Corridors website.

Project completed: 6/30/2012

3.1 FINAL REPORT - MeCC V Supplemental - Critical Land Protection Program - Trust for Public Land ($890,000)
Project Outcome and Results
In its Critical Lands Protection Program, The Trust for Public Land (TPL) used $890,000 from the Environment and Natural Resources Trust Fund (ENRTF) to secure fee title on portions totaling 50.2 acres of 407 total acquired acres. TPL conveyed these lands to public agencies for permanent protection. Individual project successes include the following:

- TPL spent $552,000 2010 ENRTF funds to protect 10.8 ENRTF acres of land as part of a larger 69-acre purchase of a high biodiversity corridor including forest, bluffland, wetland and rare calcareous fen. TPL conveyed the land to the Department of Natural Resources as the Savage Fen SNA on the Credit River addition in Scott County.
- TPL spent $338,000 2010 ENRTF to protect 39.4 ENRTF acres of land as part of a 338-acre acquisition of one of the largest undeveloped and contiguous tracts of open space in the Twin Cities Metro Area. TPL then conveyed the land to Anoka County. Located at the confluence of Cedar Creek and the Rum River, this land will be managed by the County as the Cedar Creek Conservation Area.

TPL leveraged $890,000 in TPL Metro Conservation Corridors (MeCC) 2010 funding on these projects with $1,090,000 in non-state funds to protect 357 additional pro-rated acres of land. $300,000 of this was non-state public funds and $790,000 of this was from private land value donations. Additionally, $300,000 in state RIM funds were used to protect 5.9 pro-rated acres and $3,400,000 in Outdoor Heritage Funds were used to protect 250.8 pro-rated acres. TPL's 2009 ENRTF funds in the amount of $62,000 and DNR's 2009 and 2010 ENRTF funds in the amount of $358,493 were used to protect 7.2 pro-rated acres and 7.1 pre-rated acres respectively. SNA 2006 bonding dollars in the amount of 289,507 were also used to protect 5.7 pro-rated acres. All acres acquired total 407.

*Please note, since a portion of TPL's 2009 ENRTF funding was used for the Cedar Creek Conservation Area project, a portion of these results was also reflected in TPL's 2009 MeCC Work Program update and Final Report.

Project Results Use and Dissemination
As conservation transactions were completed, The Trust for Public Land disseminated information on the TPL website, www.tpl.org, broadcast emails to Embrace Open Space (EOS) and TPL list serve members, distributed press releases, and included information in TPL's newsletters as appropriate. TPL

also worked with the long-term stewards to ensure information was distributed to their listserves and posted on their websites as well.

Project completed: 6/30/2012

3.2 FINAL REPORT - MeCC V Supplemental - Protect Significant Habitat by Acquiring Conservation Easements - Minnesota Land Trust ($485,000)

Project Outcome and Results

This 2010 grant was supplemental to the fifth phase (2009) of the Metro Conservation Corridors project. This grant provided acquisition capital needed to complete urgent projects that otherwise we would not have been able to complete. Two perpetual conservation easements were completed that collectively protect 374 acres of land and more than 700 feet of shoreline. One easement was purchased at a bargain price, and one easement was donated. The Land Trust also purchased two additional easements that used both 2009 and 2010 ENRTF funding. Because we reported those projects accomplishments as part of our 2009 report, we described them but did not count acreage in the 2010 reports to avoid double-counting. All projects represent unique opportunities to protect high quality natural habitat, riparian areas, and to build upon prior land protection work by the Land Trust at several priority sites.

Additionally, the Land Trust prepared baseline property reports for each easement, detailing the condition of the property for future monitoring and enforcement. To fund this required perpetual obligation, the Land Trust dedicated ENRTF and other funds to its segregated Stewardship and Enforcement Fund for all completed projects. We estimated the anticipated annual expenses of each project and the investment needed to generate annual income sufficient to cover these expenses in perpetuity - all in accordance with our internal policies and procedures as approved by LCCMR. We will report to LCCMR annually on the status of the Stewardship and Enforcement Fund and the easements acquired with funds from this grant.

The total value for the two easements acquired is $1,242,000. The donated value is $1,162,000. Therefore, we were able to leverage significant private donation with the State's investment in these projects.

Cumulatively, across all phases of the Metro Corridors program, the Land Trust has protected 3,672 acres of critical habitat and more than 76,000 feet of shoreline, at a cost to the State of $580 per acre.

The Land Trust's work on this project continues to demonstrate the cost effectiveness of working with 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. This grant continued to generate interest among landowners, and therefore, ongoing funding will be important to sustained success. Additionally, we believe that funds to purchase easements - even a small amount - will be necessary in the future as work becomes more targeted, selective, and focused on building complexes of protected land.

Project Results Use and Dissemination

The Land Trust disseminated information about the specific land protection projects completed under this grant though our newsletter, email updates, web site, and press releases. The Land Trust also shared information about conservation easements generally and our experience with our partner organizations, other easement holders, local communities, as well as policy makers including members of the LCCMR and LSOHC.

Project completed: 6/30/2012

3.3 FINAL REPORT - MeCC V Supplemental - Minnesota Valley National Wildlife Refuge Fee Title Acquisition - Minnesota Valley National Wildlife Refuge Trust, Inc. ($325,000)

Project Outcome and Results

The Minnesota Valley Trust acquired 103 acres of priority lands in Scott County to expand the St. Lawrence Unit of the Minnesota Valley National Wildlife Refuge. Of the 103 acres acquired, 70 acres were acquired with Environment and Natural Resources Trust Fund and 33 acres were acquired with other private, non-state funds.

An additional 63.71 acres were acquired from two other landowners using other private, non-state funds as match of the ENRTF grant. Those acquisitions expand the Jessenland Unit of the Minnesota Valley Refuge in Sibley County. The total leverage to this project was 96.71 acres acquired using other, non-state funds.

These targeted acquisitions expand upon prior acquisitions funded in part by the Environment and Natural Resources Trust Fund, as recommended by the LCCMR. The parcels acquired are adjacent to or very near other lands protected by the Minnesota Valley Trust for the Minnesota Valley National Wildlife Refuge. All are within the expansion boundaries for the Refuge as identified through a public planning process by the US Fish and Wildlife Service and documented in the Refuge's "Comprehensive Conservation Plan."

After any needed restoration and enhancement, the lands will be donated to the USFWS for perpetual management as part of the Minnesota Valley National Wildlife Refuge. They will be managed for wildlife and open to the public for wildlife-dependent recreation, including hunting, fishing, wildlife observation, photography, wildlife interpretation and environmental education.

Project Results Use and Dissemination

The Minnesota Valley Trust will publicize the completion of this project through its website and news releases. All funding partners will be acknowledged on Refuge Unit kiosks, including the Environment and Natural Resources Trust Fund, as recommended by the Legislative Citizen Commission on Minnesota Resources.

Project completed: 6/30/2012

SUBD. 05 WATER RESOURCES

Evaluation of Dioxins in Minnesota Lakes
Subd. 05f $264,000

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

Phone: (612) 625-8582
Email: arnol032@umn.edu
Fax: (612) 626-7750
Web: http://www.ce.umn.edu/directory/faculty/arnold.html

RESEARCH

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

Overall Project Outcome and Results
Triclosan is an antimicrobial agent commonly detected in wastewater effluent. During water and wastewater disinfection with chlorine, triclosan can be transformed to a series of chlorinated triclosan derivatives. When discharged into surface waters, triclosan and its derivatives react in sunlight to form a series of four polychlorinated dibenzo-p-dioxins.

To evaluate the historical and current exposure of surface waters to triclosan, chlorinated triclosan derivatives, and their derived dioxins, sediment cores were collected from wastewater-impacted Minnesota lakes. Following radiometric dating, triclosan and chlorinated triclosan derivatives were extracted from core sections and quantified. Dioxins were extracted from the same core sections and also quantified.

The concentrations and temporal trends of triclosan, chlorinated triclosan derivatives, and their dioxins in aquatic sediments were found to be a function of historical wastewater treatment operations and lake system scale. Cores collected from large-scale riverine systems with many wastewater sources recorded increasing concentrations of triclosan, chlorinated triclosan derivatives, and their derived dioxins since the patent of triclosan in 1964. The trends were directly attributed to increased triclosan use, local improvements in treatment, and changes in wastewater disinfection practices. Concentrations of triclosan, chlorinated triclosan derivatives, and their dioxins were higher in small-scale systems, reflecting a greater degree of wastewater impact. In a lake receiving no wastewater influent, no triclosan was detected. Low levels of the four triclosan-derived dioxins were found in northern wastewater-impacted Minnesota lakes prior to the introduction of triclosan as well as in the lake with no wastewater input. The background levels of these dioxins were attributed to a secondary, region-specific source. Nonetheless, it is clear that triclosan is the major source of these dioxins after 1960. The contribution of the triclosan-derived dioxins to the total dioxin pool in terms of mass was determined for each sediment core. In heavily impacted systems, the dioxin contribution from triclosan and chlorinated triclosan derivatives accounted for up to 60% of total dioxin mass in recent sediment. Thus, the discharge of triclosan and chlorinated triclosan derivatives may pose a threat to wastewater-impacted lakes.

The findings of this work suggest that additional treatment of wastewater to remove triclosan, additional regulation of triclosan use, or dissemination regarding the prevalence of triclosan in consumer products may be necessary. Full results are presented in the M.S. Thesis of Cale T. Anger submitted with this report.

Project Results Use and Dissemination
This project led to the production of the M.S. Thesis of Cale T. Anger, Quantification of Triclosan,

Chlorinated Triclosan Derivatives, and their Dioxin Photoproducts in Lacustrine Sediment Cores. The thesis received the Distinguished Master's Thesis Award from the University of Minnesota, recognizing it as the best thesis at the U of MN for 2011-2012. A manuscript with the same title has been submitted to the peer reviewed journal Environmental Science & Technology. The results of the work have been presented at the American Chemical Society National Meeting, the St. Croix River Research Rendevous, the Itasca Water Legacy Project lecture series, and the Mississippi River Forum. Two more presentations at the American Society of Limnology and Oceangraphy and the IWA Micropol and Ecohazard conferences are planned. We anticipate press coverage of the findings upon publication of the peer-reviewed article.

Project completed: 6/30/2012

Assessment of Shallow Lake Management
Subd. 05g $262,000

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

Phone: (218) 308-2283
Email: mark.hanson@dnr.state.mn.us
Fax: (218) 755-2604
Web: http://www.dnr.state.mn.us/wildlife/shallowlakes/index.html

RESEARCH

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

Overall Project Outcome and Results
Minnesota's shallow lakes provide numerous direct human benefits such as clean water, hydrologic storage to limit flooding, recreational opportunities, and access to unique wild areas. They also contribute many valuable ecosystem services including carbon sequestration, habitat for native species, and unique recreational opportunities. Unfortunately, water and habitat quality of Minnesota's shallow lakes have deteriorated dramatically during the past century. Conversion from native upland covers, widespread wetland drainage and surface-water consolidation to facilitate agricultural and urban/residential development have been implicated as major causes for these changes. To facilitate better conservation of these areas, we studied approximately 140 shallow lakes in 5 ecological regions of Minnesota to:

- Identify major factors leading to deterioration.
- Evaluate results of specific lake restoration approaches, including cost-effectiveness of various combinations of lake management strategies.
- Assess the impacts of increased surface water connectivity on fish invasions and resulting habitat quality.

Our efforts included: comprehensive sampling of shallow lakes to identify direct and indirect causes of deterioration, evaluation of approximately eight lakes currently undergoing rehabilitation, and economic analyses to help managers identify which restoration strategies are likely to produce the greatest improvements in water quality and other lake characteristics per unit cost. Our key findings were as follows:

- High nutrient levels and dense populations of undesirable fishes favor water quality deterioration. These influences increase along a NE-SW gradient. Turbid lakes more often occur in prairie than in forested regions.
- Fish removal via rotenone, water control structures, and drawdowns improve water quality and wildlife habitat. Deteriorated conditions often recur; this underscores need for long-term approaches that reduce nutrient loading.
- Fish removal via rotenone and drawdown are effective methods for improving lakes in the short-term (5-10 years). Because improvements may not persist, watershed restoration to reduce nutrient loading is also necessary. More monitoring of rehabilitated lakes is necessary. Region-specific guidelines are not yet possible, but in-lake measures will be most beneficial in short-term, regardless of where lakes are located.
- Limiting surface connectivity is critical to controlling distribution of undesirable fishes including invasive species.

These findings were used to develop improved modeling and produced a series of recommendations to guide future efforts to maintain and rehabilitate shallow lakes throughout Minnesota. This information is being disseminated through future presentations and publications and through the Minnesota DNR Data Deli website (http://deli.dnr.state.mn.us).

Project Results Use and Dissemination

We anticipate preparation of 5-8 peer reviewed manuscripts to be developed from data gathering and analyses completed during the present study. We are also planning to develop a shallow lake workshop for lake managers and other conservation partners to be held in central Minnesota during July or August 2013. We expect to offer a day-long technical program that will center on results of the present LCCMR-funded research, allow discussion of lake rehabilitation strategies, and will offer opportunities for project managers and collaborators to present study findings directly to lake and landscape managers and other conservation partners in Minnesota. Presently, the Minnesota Chapter of the Wildlife Society has agreed to sponsor this workshop and to coordinate meeting and facilities requirements.

Results and synthesis from this work have been presented at annual meetings of the American Society of Limnology (Lake Biwa, Shiga, Japan, July 2012), the Ecological Society of America (Portland, Oregon, Aug 2012), and at various regional meetings of DNR staff and others. In addition, results have been distributed to DNR staff, other professionals, and the general public via annual project summaries from the Wildlife Research Unit, Minnesota DNR. We expect to develop 5-8 manuscripts for publication during the next 2-3 years.

Project completed: 06/30/2012

SUBD. 07 RENEWABLE ENERGY

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

Subd. 07d $1,500,000

MN COALITION OF RELCs
Web: http://www.earthsensealliance.org/

07d-1 ($350,000)
Joe Deden
Eagle Bluff Environmental Learning Center
28097 Goodview Dr
Lanesboro, MN 55949
Phone: (507) 467-2437
Email: director@eagle-bluff.org
Fax: (507) 467-3583
Web: http://www.eagle-bluff.org/

07d-2 ($206,000)
Bryan Wood
Audubon Center of the North Woods
P.O. Box 530
Sandstone, MN 55072
Phone: (320) 245-2648
Email: bwood@audubon-center.org
Fax: (320) 245-5272
Web: http://www.audubon-center.org/

07d-3 ($212,000)
Dale Yerger
Deep Portage Learning Center
2197 Nature Center Drive NW
Hackensack, MN 564529
Phone: (218) 682-2325
Email: portage@uslink.net
Fax: (218) 682-3121
Web: http://www.deep-portage.org/

07d-4 ($258,000)
Karl Brown
Laurentian Environmental Learning Center
8950 Peppard Road
Britt, MN 55710
Phone: (651) 621-6041
Email: karl.brown@moundsviewschools.org
Fax: (651) 621-7405
Web: http://www2.moundsviewschools.org/laurentian/

07d-5 ($240,000)
Todd Roggenkamp
Long Lake Conservation Center
28952 438th Lane

Palisade, MN 56469
Phone: (218) 768-4653
Email: todd@llcc.org
Fax: (218) 768-2309
Web: http://www.llcc.org/

07d-6 ($234,000)
Kimberly Skyelander
Wolf Ridge Environmental Learning Center
6282 Cranberry Road
Finland, MN 55603
Phone: (218) 353-7414
Email: director@eagle-bluff.org
Fax: (218) 353-7762
Web: http://www.wolf-ridge.org/

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

07d1: EAGLE BLUFF ENVIRONMENTAL LEARNING CENTER AND OVERALL PROJECT COORDINATION

Overall Project Outcome and Results
Minnesota's six accredited Residential Environmental Learning Center's undertook a collaborative project, "Today's Leaders for a Sustainable Tomorrow," with the intent of acting as a public resource for information regarding energy use and energy technologies. This was accomplished by demonstrating geographically appropriate technologies for reducing energy use and providing public access to energy information through formal education programs and a web presence. In-depth information on each center's energy reduction demonstrations are found in their individual reports. A bulleted summary of each demonstration is as follows:

- Eagle Bluff Environmental Learning Center - Lanesboro, MN: Installed deep energy reduction retrofit, solar thermal, and a solar hot water heater.
- Audubon Center of the North Woods - Sandstone, MN: Installed geothermal heat pump, solar arrays, solar panels, and a wind generator.
- Deep Portage Learning Center - Walker, MN: Installed wood gasification system and lighting upgrades (CFLs to LEDs and T12s to T8s).
- Laurentian Environmental Learning Center - Britt, MN: Installed building envelope improvements, energy conservation technologies, and a solar hot water heater.
- Long Lake Conservation Center - Palisades, MN: Installed building envelope improvements, a solar hot water heater, and lighting upgrades (trail lighting and T12s to T8s).
- Wolf Ridge Environmental Learning Center - Finland, MN: Installed biofuel heating system, solar arrays, wind generation, and lighting upgrades (trail lighting and T 12s to T8s).

Eagle Bluff implemented a deep energy reduction retrofit on its most inefficient building, the staff residence. The building was super insulated using the Cold Climate Housings Research Center's REMOTE

(Residence Exterior Membrane Outside-insulate Technique). Solar thermal heat was added for domestic hot water and building heating. A 5.6 Kw solar photovoltaic system provides green power for the heating system. As a result of the retrofit, the building became the 9th house in North America to receive ACI's 1000 Home Challenge for reducing energy consumption by over 78% A pdf describing the project is available from Eagle Bluff.

All centers collaborated in developing over 20 new units of educational curriculum based on the following seven areas: biomass, conservation, efficiency, energy basics, food and energy, solar power and wind power. An activity toolbox was designed for use at the RELC's and in the formal classroom. They range from formal lessons to informal tours to an energy choice challenge and are currently in practice at the RELC's collectively reaching nearly 60,000 visitors/students annually. In order to determine the efficacy of the educational materials and program, an external assessment was done which evaluated the knowledge and behaviors of visitors to the RELC who participated in the activities. The results showed that 88.5% of children and 50.6% of adults had an increase in knowledge and 70.2% of children and 52.6% of adults increased their energy conserving behaviors while visiting an RELC.

Project Results Use and Dissemination
Homeowners, commercial businesses, educators and the general public can access the educational materials, assessment results, demonstration information, and current energy use/production on the Today's Leaders for a Sustainable Tomorrow website at: www.tlfast.org.

In addition, this project has allowed the centers the opportunity to collaborate with Winona State University to offer an Energy Resource Advisor course which is part of Continuing Education program and a core course in WSU's Sustainability major.

Using the TLFAST demonstrations and curriculum as the framework, the centers are also now positioned to collaborate on an innovative program funded by the National Science Foundation which focuses on providing informal STEM (Science-Technology-Engineering-Math) experiences for K-12 students.

In the upcoming year and upon the total completion of the project, the centers' will be participating in tours, conferences, or workshops to share the success of the project and publicize the resources available to the public as a result of the project.

Project completed: 6/30/2012

07d2: AUDUBON CENTER OF THE NORTH WOODS

Overall Project Outcome and Results
As part of the coalition of Minnesota's residential environmental learning centers Today's Leaders for a Sustainable Tomorrow (TLFAST), the Audubon Center of the North Woods has made reducing our carbon footprint, through energy conservation, efficiency and renewable technologies, a top priority. We aim to serve as a sustainable energy demonstration site by modeling responsible energy usage and through energy offering energy curriculum for the nearly 10,000 participants that visit us every year. Through funding from the Environment and Natural Resources Trust Fund (ENRTF), we have been able to make strides in both of these directions. With our ENRTF grant, we hired an architecture and engineering firm to design the envelope improvements and solar hot water systems that would benefit several of our campus buildings. We contracted with local builders and installers to:

1. Improve the envelopes of our two largest buildings, the Dining Hall and Crosby Dormitory, through blown cellulose insulation, foam sealing air penetrations and weather stripping exterior doors.
2. Insulate the walls and roof as well as re-side and re-shingle our 100+ year old Wildlife Barn.
3. Insulate Nationally Historic Registered Schwyzer Lodge through blown cellulose insulation in the crawl spaces and attic, as well as vapor-line and foam-seal the open air basement.
4. Install a solar hot water system at our Dining Hall for hot water use in our kitchen and dining hall restrooms.
5. Install a solar hot water system at Crosby Dormitory for hot water use of showers and sinks in the dormitory rooms.

Through these energy improvements we anticipate savings 259,570 lbs. of carbon annually from reduction in propane and electricity usage. As part of TLFAST, we have helped to create 22 energy lessons to engage and inform students about energy issues and topics to be taught at the Audubon Center and outreach programs.

Project Results Use and Dissemination
Information about this project is disseminated through the TLFAST collective website at http://earthsensealliance.org/e_energy.php. We have written about this project in our past two Audubon Center of the North Woods newsletters, and have been leading energy tours for local groups for the past several months, highlighting the outcomes of the ENRTF grant. In the spring of 2011, we contacted our 80+ participating K-12 schools about the opportunity to pilot test the energy curriculum developed and had several schools participate. Information about the completed energy lessons has been sent to all participating schools as options for their on-site or outreach programs.

Project completed: 6/30/2012

07d3: DEEP PORTAGE LEARNING CENTER

Overall Project Outcome and Results Cass County, MN has installed a small wind turbine and solar hot water system and has made electrical and envelope improvements to the environmental education facility known as Deep Portage Learning Center. A $212,000 grant from the Environment and Natural Resources Trust Fund has made this possible. All of these systems have been installed, and we now have a year's worth of energy savings data. The 10 Kw small wind turbine has produced 4,200 Kw hours of electricity and has eliminated the emission of 10,080m lbs. of carbon dioxide. The solar hot water system has produced thousands of gallons of domestic hot water and displaced 1,400 gallons of fossil fuel propane. New LED (light-emitting diodes) lights, E Solutions refrigeration equipment and new Energy Star windows round out the project. These technologies are for demonstration and education. A new sustainable energy curriculum has been developed and piloted with several Minnesota schools. Five-hundred-plus people have now gone on a renewable energy tour at the center. This project shows our residents how to reduce our carbon footprint, save money. and support local jobs and industry. The electrical use at the Deep Portage Learning Center is now an astonishing 2.2 Kw hours per square foot annually. The Carbon footprint has been cut in half, and the total energy savings is $15,000-20,000 per year. This is a model that can be repeated at public schools and government buildings around the State.

Project Results Use and Dissemination
Information about this project will be disseminated in our center's newsletters, website and blogs, emails, and annual reports. It will also be discussed in all future New ERA training seminars held on-site at each center.

The Energy Resource Advisor (ERA) certificate, developed by Winona State University, is a new curriculum designed to accelerate public understanding of energy efficiency, clean energy, carbon emissions, resource conservation, green technologies, and green jobs. This curriculum is the first of its kind in Minnesota. It is a non-credit, continuing education course for adults 18 years of age and older, using online instructional technology combined with applied, field experience at one of the six RELCs. Participants in this class will learn about: a) the basic components of an energy audit, b) small-scale renewable energy including site suitability, system sizing, and financial incentives that are available, c) alternative building and transportation options, d) ways to "green up" the home or business, and e) the field of emerging "green" jobs. After completing this course, the successful participant may serve as an energy resource advisor and "green" consultant in the community and workplace.

Deep Portage has had over 200 participants attend renewable energy tours and has taught classes to elementary students in renewable energy. We have posted data on our Facebook page, and our website has a renewable energy toolbar with data on the accomplishments of the initiative. The TLFAST and LCCMR websites also feature information.

The collective website is up and running, www.tlfast.org/dplc.html. The six centers have collaboratively developed 22 units of curriculum for use by each center. These curricula integrate the use of the demonstrated sustainable energy practices at each of the centers. These lessons were pilot tested in all six centers this past spring, adjustments made over the summer, and are now all available for groups.

Project completed: 6/30/2012

07d4: LAURENTIAN ENVIRONMENTAL LEARNING CENTER

Overall Project Outcome and Results
In 2007, a McKinstry study was conducted at the six residential environmental learning centers in Minnesota to identify ways to reduce carbon, and energy consumption. The results of the study were used as the baseline carbon and energy use for Laurentian Environmental Center. This data was submitted as part of the LCCMR ENRTF grant request that focused on carbon reduction as a result of envelope improvements for the lodge and office buildings, and a solar hot water. In 2010, Laurentian Environmental Center (LEC) was awarded $258,000 from the ENRTF. In late early fall of 2010,an RFP was sent out for the design work of the project. Wagner Zaun Architecture of Duluth was selected to design and manage the project. A predesign site assessment determined the scope of work. A design package and RFP for the energy retrofit of the lodge and office was created, and sent out. Nelson Exteriors was selected to complete the project. The retrofit work included air sealing, insulation, high efficiency windows and doors, and mechanical improvements. Construction began in fall 2010, and was completed in spring 2011.

In spring 2011, design work for the solar hot water system was conducted by Wagner Zahn Architecture, and Conservation Technologies. Bid specifications were developed. Qualified contractors were identified, and invited to submit proposals. Innovative Power Systems was awarded the contract for the design and installation of the lodge solar hot water system, and Gruska Construction was awarded the contract for site preparation and slab installation. The slab was installed fall 2011. Solar installation occurred fall/winter 2011/2012.. The solar hot water system was fully operational in April 2012.. Innovative Power Systems designed and installed a solar hot water monitoring package that was below budget, and met the center needs.

The envelope improvements in the lodge and office have made a remarkable difference in the overall comfort of the buildings. Prior to the construction, it was difficult to maintain uniform temperatures. Air sealing, insulation, and operational windows have made the building extremely comfortable for groups and staff to use. Propane use in the lodge has dropped approximately 40%, due to a combination of burning more wood for heating, and the energy retrofit projects. Future energy monitoring and utility bills will likely yield continued reductions in carbon, and energy use.

Project completed: 6/30/2012

07d5: LONG LAKE CONSERVATION CENTER

Overall Project Outcome and Results
Minnesota's six Residential Environmental Learning Centers (RELC) including Long Lake Conservation Center (LLCC) teamed up to obtain grant funding to reduce their carbon footprints and provide energy education that focuses on renewable energy. In order to get the most value from the energy efficiency measures a study was conducted for each RELC. As a result, a series of recommendations were given to reduce carbon and energy consumption. Each RELC is unique, so recommendations varied between them. Specifically for LLCC, the recommendations were to improve the energy efficiency in campus buildings, convert campus lighting to solar and LED's, design and install solar energy sources for the Northstar Lodge and Dining Hall.

LLCC goals for this project were:

1. Increase conservation measures and energy efficiency in the targeted buildings.
2. Invest in renewable energy technology applications that LLCC currently does not have.
3. Use these conservation measures and renewable energy applications to educate users on making choices about conservation and renewable energy options that are applicable to their everyday lives.

All three goals have been met and the project was under budget.

In 10 years this collective education program will reach nearly 100,000 people who will attend LLCC and participate in its programs. This includes 55-60 K-12 schools annually and a number of other colleges and organizations who use LLCC.

The project is completed with the monitoring equipment installed and tested during the last week in June. Final installation and testing of the Solar Panel for the Dining Hall was completed in May, 2012. An issue with the Mille Lacs Energy Cooperative regarding the 3 Phase inverter was solved resulting in the final installation. The issue was technical in nature and the inverter's Manufacturer's specifications were submitted to Mille Lacs Energy Cooperative, which they approved. The experience could assist in future solar projects with the cooperative. Overall the project went very well. However, over the 4th of July Holiday, LLCC experienced a lightning strike that disabled the entire phone system and the Directors computer, where the monitoring software was loaded. Aitkin County IT Department has rebuilt the computer and has re-installed the system at LLC. The phone system was also just recently repaired.

Project completed: 6/30/2012

07d6: WOLF RIDGE ENVIRONMENTAL LEARNING CENTER

Overall Project Outcome and Results

In 2007, the six residential environmental learning centers (RELCs) of Minnesota organized a collaborative group naming themselves Today's Leaders For A Sustainable Tomorrow (TLFAST). The TLFAST group that collectively serves over 550 schools in the region and over 40,000 students annually, began an effort to raise the energy education capacity of each center, along with a stronger commitment to model sustainable energy practices. Needing a baseline to begin, the TLFAST group hired McKinstry Engineering in 2007 to conduct an energy audit of each facility and recommend the best efforts to reduce energy and/or carbon footprints at each center. The McKinstry recommendations were used as a basis for action items chosen to implement at each center. At Wolf Ridge Environmental Learning Center (WRELC), the ENRTF funding enabled four projects.

1. Installation of an energy monitoring system that provides data on the generation and total consumption of energy, both electrical and heating, in each building of the facility. Use of the system provides accurate information to instructors of conservation lessons while also providing maintenance personnel with data to focus on documented energy wasting conditions.
2. Upgrading the building envelopes in 5 buildings by replacing the worst insulating and sealing doors with a Curries Trio-E Door. This door product is one of the most energy efficient, highest performing commercial doors available. Following professional site evaluation and calculation, replacing the five doors will achieve savings of 125,034 kBtu or 42,673 kWh of energy. Four of the five doors are in buildings heated by wood, thus carbon neutral; at the fifth location, the door is calculated to conserve 2,888 kg of CO2.
3. Upgrade to energy efficient interior lighting by conversion of the last of the campus' T12 fluorescent fixtures, 106 total, to T8 technology; a reduction of 33% energy use, thus 33% reduction in carbon footprint. Also upgraded was the entire outdoor campus lighting system by replacing all 46 fixtures with LED lighting technology. This achieved a 74% reduction in energy consumption and carbon footprint for lighting at the center.
4. The addition of a solar domestic hot water heating system to the East Dormitory that houses 180 students. The installed system will supply 50% of the annual hot water need for the building occupancy while reducing the domestic hot water carbon footprint by 49%.

A fifth project was originally proposed and approved with the ENRTF funding, a recapture of waste heat from refrigeration systems in the center's kitchen, but following initial work on the project, expert opinion and consultation quickly revealed problems and the project was aborted following an approved amendment for redistribution of funds. The budgeted funds were moved into three of the other four projects.

As the project only recently concluded, data collection is not yet adequate to document the change in carbon footprint for the entire center, but examples listed above by project, provide via calculation the reductions in energy and/or carbon footprint. To further enhance the education effectiveness of these demonstrations, 24 energy education lessons were created with the ENRTF funding and have been implemented at the six respective centers.

Project Results Use and Dissemination

It is important within every energy sustainability learning experience that students' understand that to achieve energy sustainability the best investment value for the effort is to first begin with conservation, then move to increased efficiencies and finally to new renewable energy generation. Wolf Ridge chose and implemented projects that will demonstrate and be regularly used to teach all three concepts. On a daily basis our students will engage with energy efficient doors, view the trail in front of them lit by an energy efficient LED light fixture, see the panels that renewably generate the hot water for their shower, and learn from a monitoring system how much energy was used or conserved in their dormitory. These

are the learning experiences that occur simply by living at WRELC as a student for a week.

Immediately after the ENRTF funding was made available to the TLFAST group, the energy education specialists of the six centers met and outlined plans for over 20 new units of energy curriculum to be developed. Twenty-four new curricular units on energy were developed, pilot tested with students, refined, and written lesson plans were prepared with accompanying Minnesota graduation standards. Lessons were created for eight subject areas: biomass, climate change, conservation, efficiency, energy basics, food and energy, solar power and wind power. Developed lessons have been incorporated into curriculum in the following WRELC courses: Climate Change, Renewable Energy, and Conservation Challenge. All of the lessons as well as 19 point of action posters are available at the web site for free download, www.tlfast.org. The free and publicly available curriculum on the web site is also made available to the over 550 schools that attend the collective group of RELCs. See the comprehensive report from Eagle Bluff ELC that provides more detail on the educational dissemination of the collective effort of the six RELCs known collectively as TLFAST.

The fulfillment of the project as per its title became evident even before the project was complete. Not only are the participants in WRELC programs learning from the demonstrated installations, but also political leaders, agency staff of Minnesota and corporate business leaders. To date 123 people have come to tour and learn from the sustainable energy installations including: the Ambassador of Sweden, leaders of several different offices of the Minnesota Department of Natural Resources, staff of US Senator offices, native tribal leadership and corporate leaders interested in renewable energy. In program participation, WRELC recorded 13,084 participants last year on the WRELC campus, with another 10,843 in off site programs. The on-campus attendance is an extremely consistent number of students that are annually learning from these models of energy sustainable practices at WRELC. With support from the ENRTF, WRELC is changing how our future generations will see their own future. What is considered "cutting edge" to adults, is being learned and viewed by our children as behaviors and technologies that are simply "the appropriate way we live" in the 21st century. Through this project we have furthered established this transformation for thousands of Minnesota children each year.

Project completed: 6/30/2012

SUBD. 08 ENVIRONMENTAL EDUCATION

Connecting Youth with Nature
Subd. 08c $160,000

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

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

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

Overall Project Outcome and Results
Connecting Youth with Nature has successfully achieved it goals as initially proposed. The working title of the project was changed to the "Digital Photography Bridge to Nature" because there were federal agencies using the name "Connecting Youth with Nature" for other environmental education initiatives. Two statewide coordinators were hired under contract-one for the metropolitan region and one for greater Minnesota. Nine workshop facilitators were hired to deliver 80 Digital Bridge workshops over the course of the project. The kickoff teacher workshop was held on July 10 at Luverne, Minnesota, and was attended by 60 teachers. The keynote speaker was world-reknown National Geographic photographer Jim Brandenburg who grew up in Luverne, Minnesota.

A total of 40 camera kits of 12 cameras each and several field guides were purchased and assembled with additional funds provided by the Nongame Wildlife Program and the DNR Division of Parks and Trails. Additional cameras were purchased for use on "Photo safari" programs in State Parks.

For the 24 month period from July 10, 2010, through June 30, 2012, a total of 84 teacher workshops were carried out for a total of 1147 teachers. The goal of the project was to present 80 workshops reaching 1000 teachers in two years. In addition to facilitating teacher workshops, project facilitators have also gone into classrooms with teachers and taken the students on "photo safaris". A total of ten photos safaris were carried out with teachers with a total of over 500 students.

Workshop facilitators have been providing the camera kits to teachers so they can carry out their photo safaris after attending Digital Bridge workshops. The Nikon digital cameras selected for this project have been holding up very well to such intensive use. Only ten cameras out of 500 have been damaged beyond repair.

Project Results Use and Dissemination
Information on the Digital Photography Bridge to Nature project is available on the DNR website (http://www.dnr.state.mn.us/eco/nongame/projects/digitalbridge.html). Additional publicity on this project has been shared on local and state newspapers, radio, television, and the national Birdwatching magazine.

Project completed: 06/30/2012

Project Get Outdoors
Subd. 08h $15,000

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

Phone: (507) 951-5885

Email: sara.grover@yahoo.com
Fax: (507) 932-5938
Web: http://mnprojectgetoutdoors.org/

Appropriation Language
$15,000 is from the trust fund to the commissioner of natural resources for an agreement with Project Get Outdoors, Inc. to develop out of school programs connecting children to local nature experiences.

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

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

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

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

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

Since completing the assembly of the 50 Activity Backpacks and 32 Equipment Trunks, Project GO has formed a partnership with local public health and child care resource professionals to look at implementing our program into the larger child care centers that serve school age children during the after school hours. We are currently piloting this at a child care center in Caledonia and looking to work with two child care centers in Rochester. We will train the school age room staff at these centers to use our backpacks at least once a week. As an incentive for them to use the backpacks and journal their experiences, Project GO will provide a person to come out to their site no more than once a month to lead a hands-on nature activity using one of the Equipment Trunks. This new approach with child care centers will allow us to serve many more children. Project GO will be presenting at an upcoming Focus

on the Child conference in Rochester, sharing this information with child care providers from across the southern region.

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

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

Project completed: 11/16/2010

Online Field Trip of Minnesota River
Subd. 08k $124,000

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

Phone: (507) 389-5492
Email: kimberly.musser@mnsu.edu
Fax: (507) 389-5493
Web: http://mrbdc.mnsu.edu

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

Overall Project Outcome and Results
Considerable public funding and effort has gone into better understanding and restoring the Minnesota River. Research about the river is housed in an array of scientific publications not easily accessible for the public. This project helps to bridge the information gap between researchers and the public and to generally improve environmental education about the river. The project's goal is to increase public awareness about the river's health by using new media techniques to engage students and the public.

Major results included 1) developing and delivering the "Ask an Expert about the Minnesota River" website and 2) performing educational outreach. This project developed a multi-media virtual field trip with accompanying educational materials to showcase what scientists are learning about the Minnesota River. Citizens have a unique opportunity to learn directly from natural resource experts about the current state of the Minnesota River. Video clips of interviews and related information are available online on the Minnesota River Basin Data Center website: http://mrbdc.mnsu.edu/learn.

Online Educational Website - Ask an Expert about the Minnesota River
Video clips of scientist and citizen experts answering questions about the river's health are the central

feature of the website enriched by accompanying handouts, and graphics. Specifically, the major features of the website include:

- 171 video clips of experts answering questions;
- 27 handouts with background information developed to enrich each theme;
- 9 panoramic virtual tours and 20 slideshows;
- 5 educator's guides and 7 accompanying PowerPoint presentations on prairies, wetlands, agriculture, fish, and mussels.

Educational outreach and learning stations

Four computer kiosks (learning stations) were installed at key educational centers across the basin - specifically Treaty Site History Center in St. Peter, MN; Regional River History Center in New Ulm, MN; Ney Nature Center in Henderson, MN; and Clean Up the River Environment (CURE) office in Montevideo, MN - likely reaching 4,000-8,000 people in the upcoming year. Open houses at the four educational centers and other events directly reached approximately 349 people during the project period. Four school classroom presentations reached approximately 371 students.

Project Results Use and Dissemination

The broad dissemination goals for the project are to share data with the public, students and teachers through both traditional and nontraditional outreach methods. The dissemination of this project proceeded at several levels. All the project data is available on the web in a user-friendly format. Computer kiosks (learning stations) highlighting the project were developed and installed in four key river and history centers across the basin. We also conducted outreach to three schools and four educational centers that included presentations and open houses. We have also used social media resources such as Facebook and YouTube to disseminate information about the project.

We worked collaboratively with a wide range of state and local agencies (MPCA, MDNR, Department of Agriculture, etc.) and citizen organizations (CURE, Ney Nature Center, Nicollet County Historical Society) to develop and publicize the project. Project staff have spoken about the project to local and state officials and staff, nonprofit organizations, teachers and students, and citizens. The project has received attention at scientific meetings (both poster session in 2011 and presentation in 2012 at the Minnesota Water Resources Conference) and educational training (DNR Naturalists). The project team plans to continue outreach to schools and putting on public events to promote the project and further raise public awareness about the Minnesota River.

Project completed: 06/30/2012