



**Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2011 Work Plan**

Date of Status Update:

Date of Next Status Update: 6/1/2012

Date of Work Plan Approval: 6/23/2011

Project Completion Date: 6/30/2014

Is this an amendment request? _____

Project Title: Minnesota County Biological Survey

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Location:

Counties Impacted: Statewide

Ecological Section Impacted: Lake Agassiz Aspen Parklands (223N), Minnesota and Northeast Iowa Morainal (222M), North Central Glaciated Plains (251B), Northern Minnesota and Ontario Peatlands (212M), Northern Minnesota Drift and lake Plains (212N), Northern Superior Uplands (212L), Paleozoic Plateau (222L), Red River Valley (251A), Southern Superior Uplands (212J), Western Superior Uplands (212K)

Total ENRTF Project Budget:	ENRTF Appropriation \$:	2,250,000
	Amount Spent \$:	<u>0</u>
	Balance \$:	2,250,000

Legal Citation: M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 03a

Appropriation Language:

\$1,125,000 the first year and \$1,125,000 the second year are from the trust fund to the commissioner of natural resources for continuation of the Minnesota county biological survey to provide a foundation for conserving biological diversity by systematically collecting, interpreting, and delivering data on plant and animal distribution and ecology, native plant communities, and functional landscapes.

I. PROJECT TITLE: Minnesota County Biological Survey

II. PROJECT STATEMENT: The need to protect and manage functional ecological systems, including ecological processes and component organisms continues to accelerate with increased demands for water and energy, continued habitat fragmentation, loss of species and genetic diversity, invasive species expansion, and changing environmental conditions.

Since 1987 the Minnesota County Biological Survey (MCBS) has systematically collected, interpreted and delivered baseline data on the distribution and ecology of plants, animals, native plant communities, and functional landscapes. These data help prioritize actions to conserve and manage Minnesota's ecological systems and critical components of biological diversity. By July 2011 surveys were completed in 81 of the state's 87 counties, including all counties where native prairie habitat was a targeted rare resource.

During this project period surveys will continue in northern Minnesota and sites will be established to monitor the effectiveness of management and policy activities in selected sites in the western prairie region of the state. Information system capability will be expanded and interpretation of results will include web-delivery, technical assistance, and publications.

III. PROJECT STATUS UPDATES:

Project Status as of January 2012

Project Status as of October 2012

Project Status as of March 2013

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Field Surveys and Monitoring

Description: Data on the distribution and ecology of plants, animals, native plant communities and functional landscapes will be collected, providing a basis for the maintenance of elements of biological diversity and ecological systems through ecological management, monitoring, planning, research, and critical habitat acquisition.

Monitoring will begin to assess impacts of policies and management activities on various components of ecological systems and species populations in the Tallgrass Aspen Parklands and the Prairie Parkland Ecological Provinces, where MCBS has completed baseline data collection. Monitoring needs associated with these ecological provinces have been highlighted in a number of recent initiatives such as the *Minnesota Prairie Conservation Plan 2010: A Habitat Plan for Native Prairie, Grassland, and Wetlands in the Prairie Region of Western Minnesota* (Minnesota Prairie Plan Working Group 2010), the State of Minnesota's Forest Certification process (DNR 2005) and the State's Wildlife Action Plan (DNR 2006). These complement many of the critical land protection goals identified in the Statewide Conservation and Preservation Plan (2008).

Procedure:

Data review and Survey site identification (see Map 1): Plant ecologists, botanists and zoologists review existing relevant natural resource data and record information using Geographic Information Systems and other DNR information systems to consolidate and organize data. Examples of these data include forest inventories, wetlands inventories, aquatic plant surveys, wildlife habitat inventories, park surveys, soil surveys, land-use data, historical public land surveys, academic research, and records from museum collections. Using these data, supplemented by the interpretation of aerial photography or other imagery, staff identify MCBS sites and species habitats for targeted surveys.

Monitoring site identification (see Map 2): The Aspen Parklands Province contains Minnesota’s largest, most continuous and highest quality prairie/parkland ecological systems. As a result of MCBS baseline surveys, three core areas encompassing MCBS sites of outstanding or high biodiversity significance were identified in the province. In a number of recent plans—including the Minnesota Prairie Conservation Plan, the Aspen Parkland Important Bird Area, the State Wildlife Action Plan, and preliminary Minnesota Forest Certification monitoring plans for High Conservation Value Forests—guidance is provided for the identification of measures of successful management. Within these core areas of the Aspen Parklands Province, monitoring sites will be selected to measure: 1) stable or increasing populations of birds and mammals characteristic of the Aspen Parklands; 2) stable or increasing populations of terrestrial invertebrates with a focus on butterfly and moth species; and 3) maintenance of high-quality condition of native prairie plant communities and prairie complexes. Prairie vegetation sampling and species survey protocols have been developed in the Minnesota River Valley to assess specific fire and grazing management activities at a large management area. In the Aspen Parklands, another project area will be identified to repeat the sampling protocols related to the use of fire and grazing management.

Small white lady’s-slipper (*Cypripedium candidum* - see Map 2) is identified as an important ecosystem measure in the Minnesota Prairie Conservation Plan. In the Prairie Parkland Province, monitoring will focus on high-quality prairie/wetland sites containing populations of small white lady’s-slipper. Sites will be selected to represent the geographic range of the species in the western Minnesota prairie.

Coordination: Staff notify and coordinate surveys and monitoring activities when possible with other divisions within the DNR, universities, counties, municipalities, tribal governments, watershed districts, federal natural resource agencies, conservation organizations, corporations, and individual landowners. This is critical to the success of data consolidation and field surveys.

Field Surveys: Ground surveys to assess MCBS site and native plant community quality and condition include the collection of vegetation samples in coordination with other sampling (soils, water chemistry etc.) when possible. Aerial surveys will be especially important to the survey of the large peatlands where ground access is extremely challenging. Additional specialized techniques are used during field seasons to survey selected rare species or groups of species (e.g., plants, birds, mammals, reptiles, amphibians, insects, fishes). Monitoring activities will be designed to inform specific management activities or be conducted to update historic baseline data (presence/absence) with more detailed collection of population size and estimated viability.

Summary Budget Information for Activity 1:

ENRTF Budget: \$ 900,000
Amount Spent: \$ 0
Balance: \$

Activity Completion Date:

Outcome (see also attached maps)	Completion Dates	Budget
1. Field survey: Lake County	Fall 2012	
2. Field survey St Louis County: Nashwauk Uplands	plants, native plant communities (npc) Fall 2012; animals begin 2012	
3. Field survey St Louis: Border Lakes	animals 2013; plants, npc begin 2011	
4. Field survey St Louis: Tamarack Lowlands	plants, npc, animals begin 2012	
5. Field survey St Louis: Littlefork-Vermillion Uplands	plants, npc, animals begin 2012	
6. Field survey: Beltrami & Clearwater counties	plants, npc Fall 2012; no animals	
7. Rapid assessment: Potential survey sites identified in Lake of the Woods and Koochiching counties.	Dec 2012 (interpretation of aerial imagery/other natural resource data)	
8. Monitoring samples collected to	2012 Establish locations and sample	

measure management actions; establish permanent plots.	selected birds, mammals, terrestrial invertebrates at up to 10 management sites in Aspen Parklands (AP). 2012 Establish and collect data on 10 permanent npc plots (AP). Identify grazing/fire management monitoring project area. 2012, 2013 Sample at least 20 populations of small white lady's-slipper (<i>Cypripedium candidum</i>).	
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Note: The status of each activity above is described in regular work program updates.

Activity Status as of January 2012

Activity Status as of October 2012

Activity Status as of March 2013

Final Report Summary:

Activity 2: Information System Expansion

Description: MCBS provides data and specimens to museums and information systems. This results in long-term storage of collections and databases for analysis and distribution of information to individuals, organizations, and agencies with diverse natural resource goals.

Procedure: Data collected by MCBS are entered into manual and computerized files in the DNR's information systems. Key databases include those tracking locations of plants and animals, rare features, relevés (vegetation plot samples), aquatic plant lists/lakes, MCBS sites, native plant community polygons (GIS), and animal aggregations. Locations of native plant communities and MCBS sites are mapped using ArcGIS and procedures are in progress to provide for updates to these shape files. Shape files of native plant communities and MCBS sites are available on the DNR's Data Deli, accessible through the website.

Targeted species locations are entered into an Observation Database that is connected to Biotics, an information system developed by NatureServe, an international organization with a major focus on the storage, distribution, and interpretation of rare features data. Photographic vouchers, imagery, and other digital media are stored at the DNR, St. Paul. Field data sheets or data collected on field data recorders are filed electronically and/or manually.

Data generated by monitoring activities are entered into the databases listed above or in related databases that provide for analysis. For example, the Observation Database can be modified to store the results of repeated visits to populations of small white lady's slipper where more detailed population information is collected such as number of plants per area, number in bloom or fruit, etc. These data are linked to an updated map of the spatial extent of the population in the prairie/wetland site using GIS. Monitoring data collected for animals might include timed searches, point counts, and plot counts, which are also stored in the Observation Database.

Monitoring data will be provided to be linked to management databases currently in use or being developed in the DNR (Divisions of Fish and Wildlife, Forestry, Ecological and Water Resources and Parks and Trails). In addition, data will be accessible to other partners in prairie/grassland and forest management who maintain adaptive management databases associated with specific managed areas.

Information System Development: The collection and management of data continues to improve through the use of GIS, global positioning systems, tools/products accessible on the web, and field data recorders. MCBS participates in the DNR's efforts to maintain data standards and quality of data, to integrate databases, and to improve information delivery on the web. Data delivery using the web requires heightened attention to data standards, data security, metadata, and other documentation.

MCBS also coordinates with other state and national information system developments. For example, recent collaboration with the Bell Museum on developments related to collections management and information access is anticipated to continue, with specific attention to the rapidly changing taxonomy of flora and fauna. Long-term monitoring of species and habitats is especially influenced by the need to "crosswalk" new and old names of species, which is critical to reliable analysis, interpretation and communication of results. A new version of NatureServe's Biotics (Biotics 5) will be installed during this project period.

Preparation of Collections: All plant and animal specimens are identified and collections are prepared for permanent storage and deposited in appropriate repositories at the University of Minnesota's J.F. Bell Museum of Natural History and at the Science Museum of Minnesota.

Summary Budget Information for Activity 2:

ENRTF Budget: \$ 800,000
Amount Spent: \$ 0
Balance: \$

Activity Completion Date:

Outcome	Completion Dates	Budget
1. Survey data entered and managed in DNR's information systems.	Winter 2011, Winter 2012	
2. Preparation & delivery of plant & animal collections to museums.	Winter 2011, Winter 2012	
3. Monitoring data entry & analysis (DNR Info Systems)	Winter 2011, Winter 2012	

Note: The status of each activity above is described in regular work program updates.

Activity Status as of January 2012

Activity Status as of October 2012

Activity Status as of March 2013

Final Report Summary:

Activity 3: Guidance for Conservation and Management

Description: MCBS will provide interpretation of results through products and technical assistance to guide private and public conservation and management of ecological systems, rare resources, and sites of biodiversity significance.

Summary Budget Information for Activity 3:

ENRTF Budget: \$ 550,000
Amount Spent: \$ 0
Balance: \$

Activity Completion Date:

Outcome	Completion Dates	Budget
1. DNR's website provides updated and accurate survey & monitoring procedures, results and tools. (Examples given at right--not an exhaustive list).	Add GIS map files of results in 4 counties (2011). Update Rare Species Guide for 20 species (2011), 20 species (2012). Create data portal for: -Vegetation plot data (Winter 2011) -MCBS site data (Winter 2012) -MN plant list database (June 2013)	
2. Ecological Evaluations (EE) are reports describing attributes of high-biodiversity sites to guide conservation, management, and monitoring actions.	(Example: LaSalle Lake EE in Hubbard County). Write 10 EEs (Winter 2011); 10 (Winter 2012); 10 (July 2013).	
3. Monitoring results provided to monitoring collaboratives & resource managers to inform future conservation/management actions.	Winter 2012, June 2013	
4. Technical assistance: e.g., advice on grazing and prescribed fire plans, aquatic plant management guidelines, national vegetation plot-monitoring protocol and restoration of plant communities, county plans addressing biodiversity and native habitat protection, forest certification.	Throughout project period	
5. Aspen Parkland-Red River Valley natural history guide book based on the results of MCBS.	Manuscript delivered spring 2012; Publication by June 2013	

Note: The status of each activity above is described in regular work program updates.

Activity Status as of January 2012

Activity Status as of October 2012

Activity Status as of March 2013

Final Report Summary:

V. DISSEMINATION:

Description:

MCBS data are stored primarily in the Division of Ecological and Water Resources information systems, which are increasingly linked to other databases in the MN DNR. In addition, MCBS procedures, updates, recent maps, and links to related data are presented on the DNR website. Many GIS datasets are delivered to clients through the web. Data on rare species are available through agreements with the requesting agency and the DNR. For data on locations or rare features, a data request form is available via the web: <http://www.dnr.state.mn.us/eco/nhrp/nhis.html>

MCBS publishes and distributes survey results in a variety of formats for various audiences. Many products are available on the DNR website, including GIS shape files of native plant communities and MCBS sites, native plant community field guides, and guides to sampling techniques such as vegetation plot data collection using the relevé method. MCBS web pages are updated with new information and have links to associated resources. <http://www.dnr.state.mn.us/eco/mcbs/index.html>

The DNR and Legislative libraries and other local information repositories (such as libraries within counties) have access to published products, including books, maps, reports, field guides and digital media. MCBS has published several books and field guides and the publication of a natural history book based on MCBS data collected in the northwestern prairie region and Red River Valley is underway. Based on local collaborator interest and the results of regional focus groups, this book will include a guide to selected natural areas of the region. A Minnesota publisher has agreed to publish this book.

Staff routinely make presentations that describe MCBS methodologies and results to a wide range of audiences including county boards, local planning groups, citizen advisory groups, other biologists, land managers, and students. MCBS staff provide local planners with ecological interpretations describing important sites of biodiversity identified during the Survey to assist with management plans. Staff lead or participate in technical workshops and field trips to exchange ideas on survey methodology and provide training in the application and interpretation of the data.

Physical collections are deposited at Minnesota repositories, primarily at the University of Minnesota's J.F. Bell Museum of Natural History and at the Science Museum of Minnesota, St. Paul. As part of a larger network of museums and herbaria, these cooperators are essential to the documentation and sharing of MCBS results. MCBS and museum staff meet periodically to address curatorial, data management, and interpretive needs.

MCBS also delivers data through an international organization, NatureServe and also shares data with cooperators at colleges and universities and with others in ecological regions where surveys are ongoing or completed.

Activity Status as of January 2012

Activity Status as of October 2012

Activity Status as of March 2013

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget:

Budget Category	\$ Amount	Explanation
Personnel:	\$ 1,969,000	Biologists, Ecologists for surveys, monitoring, technical assistance and interpretation, Information Managers and Officers
Professional/Technical Contracts:	\$ 70,000	Survey and monitoring will require contractual agreements following standard DNR procedures for contract processing.
Service Contracts	\$ 50,000	This includes service level agreements for application development (such as the vegetation sampling database development) and some other information management system support needs following procedures required by DNR's Management and Information System Bureau.
Equipment/Tools/Supplies:	\$ 21,000	Field equipment/supplies. Equipment is used from previous survey periods when at all possible (For example-GPS units, canoes, cameras, communication equipment etc.) Sometimes new technology to expedite data collection is merited-for example data recorders of between \$2000 and \$3500 potentially could reduce data entry time (a few units will be purchased to explore their durability and convenience in remote areas). In addition, items such as batteries, collecting materials, paddles, and aerial photography need to be replaced or updated.
Travel Expenses in MN:	\$ 140,000	This is largely related to field survey and monitoring. Travel expenses are subject to State of Minnesota labor agreements and DNR policy. Most travel expense is related to the 4-5 months of time when 14 staff are conducting field work that requires food, transport in seasonal DNR fleet vehicles and lodging (The preferred and least expensive options are locally rented "field houses" or camping and the most expensive are motels). The current work in the large peatlands of north-central MN requires some helicopter transport with rates of approximately \$900/hour. In contrast, canoe transport in the Border lakes region requires a vehicle to transport the canoe to an entry point, then up to 10 days of canoeing/camping in order to conduct surveys.
TOTAL ENRTF BUDGET:	\$ 2,250,000	

Explanation of Use of Classified Staff: Any classified staff position paid for by ENRTF will either:
 1) Be backfilled with a new position OR 2) The work done by this position will be delayed, eliminated, or completed by the start of the project. The activities of all or portions of the following six classified staff are directly related to this work program.

A portion of the time of two plant ecologists (1.50 FTE) is directed to the authorship of the Aspen Parkland-Red River Valley natural history/guide book that is specifically identified in Activity #3. Due to decades of their field experience and investigation in the prairie and parkland region, these ecologists bring knowledge and perspectives that will result in a professional and accessible publication. The other .50 FTE of their time is proposed to receive Federal endangered species funding for rare plant monitoring activities and State Wildlife Grant funding for an insect project.

A MCBS ecologist/northern coordinator currently working 100% on the survey will be paid in part by ENRTF (.50 FTE).

The GIS specialist (.50 FTE) will manage the shape files developed by the project. He will be responsible for adding to and maintaining the polygons of native plant communities and the MCBS sites of biodiversity significance on the DNR’s website. He also develops customized GIS projects and products to be used in plans and publications. Since this .50 FTE of work is specific to MCBS, there is no one else needed to backfill to accomplish other Divisional tasks. A portion of another information specialist (.15 FTE) is needed specifically to manage the MCBS update of the state plant checklist and the related vegetation monitoring data (Activities 2 and 3). This person will also manage service level agreements for work by the DNR’s Management Information Systems Bureau.

A botanist (1.0 FTE) is needed to verify identification of plants collected by MCBS botanists and plant ecologists, to coordinate with the repositories of these collections (herbaria), to help guide *Cypripedium candidum* monitoring (Activity #1) and to assist with the update of the rare plant species guide identified in Activity #3. Some of the botanist’s previous responsibilities have been assigned to others or are included projects that have been completed or eliminated from Divisional priorities.

Explanation of Capital Expenditures Greater Than \$3,500: N/A

Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation: 14.8 FTE

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state			
State Wildlife Grant-Federal grant --pending	\$ 500,000	\$	Animal surveys, data management and monitoring.
State			
General Funds--pending	\$ 420,000,	\$	Rent, salary of supervisor, shared services
Heritage Enhancement Account (Lottery-in-lieu)	\$1,159,000		Salaries, contracts, supplies, rent
Outdoor Heritage	\$ 80,000		Prairie management assessment
TOTAL OTHER FUNDS:	\$ 2,159,000	\$	

(\$127,980 is estimated for DNR shared services; \$165,000 for estimated Division Support). Shared services (operations support governance) are services that DNR relies on in order to conduct business and support the work of the department. These services are more efficient when shared.

VII. PROJECT STRATEGY:

A. Project Partners: This request does not include funding for the following primary partners: The Bell Museum, the Science Museum, and the Superior National Forest. Red Lake Reservation lands are being surveyed in collaboration with Red Lake Department of Natural Resources. NatureServe provides guidance in database structure, collection, and distribution standards.

B. Project Impact and Long-term Strategy: Funding for an ongoing Minnesota Biological Survey will be requested to address: **1) Data Gaps**, including survey of areas where weather conditions, life-history cycles, lack of experts, etc. left data gaps (e.g., invertebrates, aquatic plants); and identification of outstanding aquatic landscapes (lakesheds, watersheds, groundwater systems). **2) Re-Survey** of landscapes altered due to habitat fragmentation, development, and invasive species, especially where MCBS was conducted in the 1980s–1990s. **3) Expansion of Monitoring** of ecological conditions in sites of biodiversity significance to assess impacts of policies and management activities on ecological systems and species populations (e.g., prairie grazing, recreational activities, groundwater use, forest

certification, climate change, energy, and invasive species). **4) Use of new technology** in remote sensing, data collection, analyses, modeling, and information delivery; these will be combined with traditional survey methods (field biologists) and communication pathways (e.g., personal contacts by professionals, publications).

C. Spending History:

Funding Source	FY 2004-05 ML2003 Subd. 08a	FY 06-07 ML2005 Subd. 8a	FY08-09 ML 2007 Subd. 6a	FY 2010-11 ML2009 Subd. 3a
ENRTF	900,000	1,000,000	1,500,000	2,100,000
General Fund	373,000	373,000	700,000	700,000
RIM (General)	181,400	181,400		
Heritage Enhancement	1,012,400	1,125,000	1,159,000	1,159,000
State Wildlife Grant (Federal)	429,500	439,000	400,000	500,000

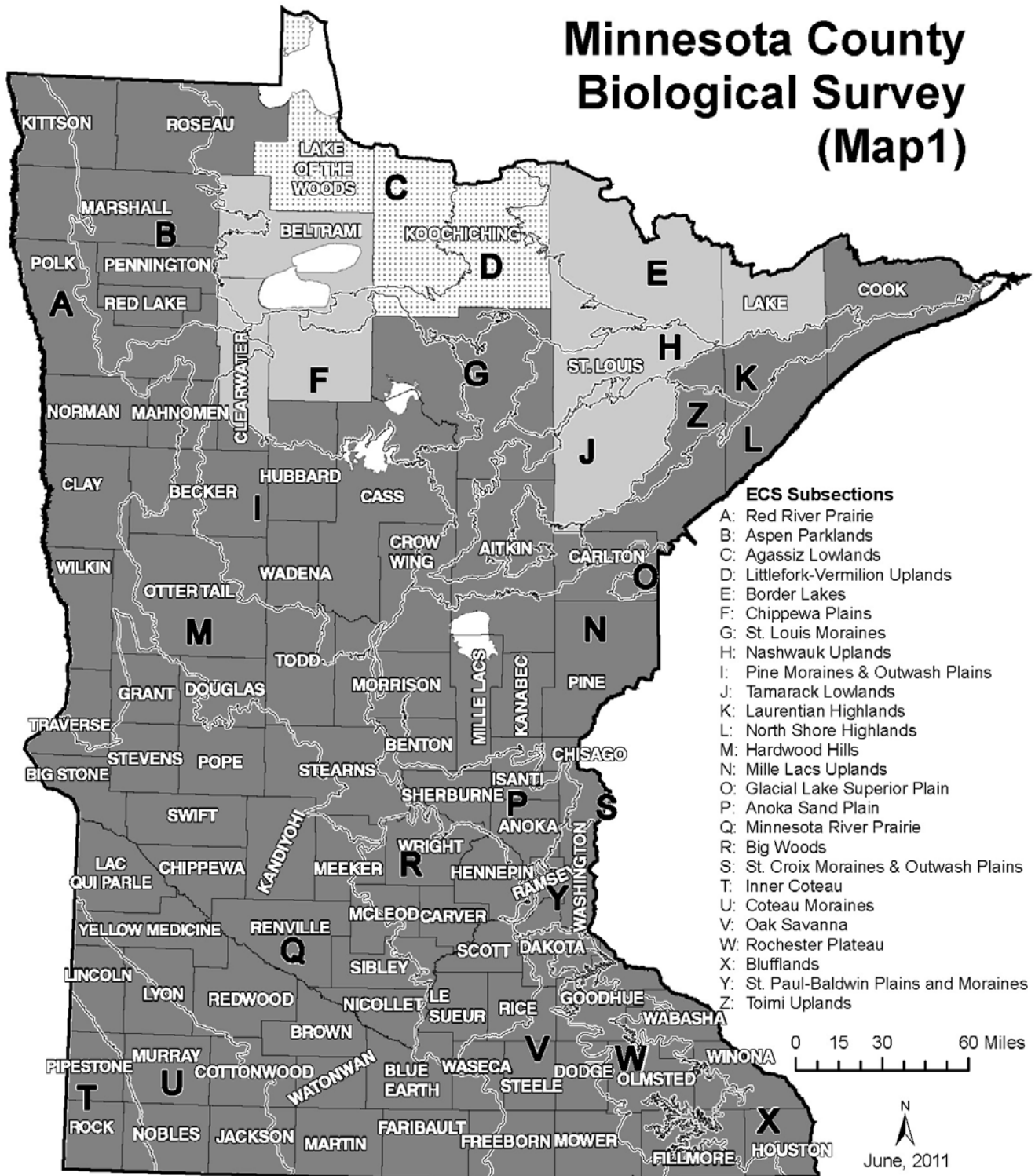
For further detail on past spending, please see table in MCBS final work program: Legal Citation: ML 2005, First Special Session, Chap. 1, Art. 2, Sec. 11, Subd. 8a.

VIII. ACQUISITION/RESTORATION LIST: N/A

IX. MAP(S):

ENRTF 2011-2012 Minnesota County Biological Survey

Minnesota County Biological Survey (Map1)

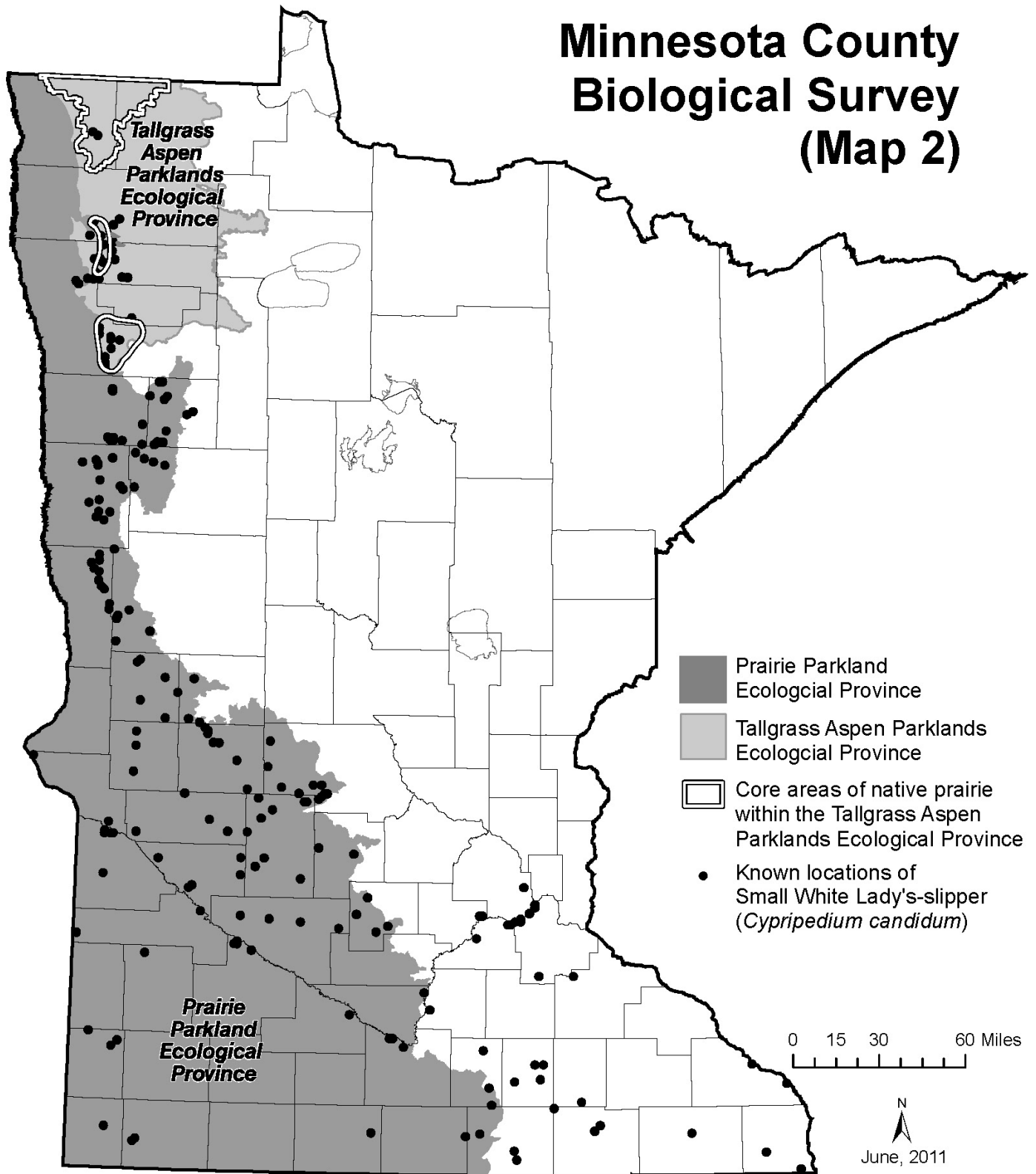


ECS Subsections

- A: Red River Prairie
- B: Aspen Parklands
- C: Agassiz Lowlands
- D: Littlefork-Vermilion Uplands
- E: Border Lakes
- F: Chippewa Plains
- G: St. Louis Moraines
- H: Nashwauk Uplands
- I: Pine Moraines & Outwash Plains
- J: Tamarack Lowlands
- K: Laurentian Highlands
- L: North Shore Highlands
- M: Hardwood Hills
- N: Mille Lacs Uplands
- O: Glacial Lake Superior Plain
- P: Anoka Sand Plain
- Q: Minnesota River Prairie
- R: Big Woods
- S: St. Croix Moraines & Outwash Plains
- T: Inner Coteau
- U: Coteau Moraines
- V: Oak Savanna
- W: Rochester Plateau
- X: Blufflands
- Y: St. Paul-Baldwin Plains and Moraines
- Z: Toimi Uplands

- Survey completed 1987-2011
- Survey in progress
- Rapid assessment to begin 2011

Minnesota County Biological Survey (Map 2)



X. RESEARCH ADDENDUM:N/A

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted not later than January 2012, October 2012, and March 2013. A final report and associated products will be submitted between June 30 and August 1, 2013 as requested by the LCCMR.

