



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2013 Work Plan

Date of Status Update Report: 11/2012

Date of Next Status Update Report:

Date of Work Plan Approval:

Project Completion Date: 06/30/2015

Is this an amendment request? NO

PROJECT TITLE: Minnesota Biological Survey

Project Manager: Carmen Converse

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Location:

Baseline surveys located in: Beltrami, Clearwater, Lake, St. Louis, Koochiching and Lake of the Woods counties. These include portions of the Border Lakes (212La), Nashwauk Uplands (212Lc), Littlefork Vermillion Uplands (212Ma), Agassiz Lowlands (212Mb), Chippewa Plains (212Na), St. Louis Moraines (212Nb), Tamarack Lowlands (212Nb), Hardwood Hills (222Ma), and Aspen Parklands (223Na) ecological subsections.

Monitoring: Selected sites statewide

Total ENRTF Project Budget:

ENRTF Appropriation: \$2,650,000

Amount Spent: \$0

Balance: \$2,650,000

Legal Citation: M.L. 2013, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

DRAFT

I. PROJECT TITLE: Minnesota 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 clean water, energy and arable land. Habitat fragmentation, loss of plant and animal species and genetic diversity, changing landscape patterns, contamination of water resources and invasive species expansion require data and analytical tools to optimize conservation of the most functional systems and provide guidance and monitoring to maintain or restore declining systems.

Since 1987, the Minnesota Biological Survey (MBS) has systematically collected, interpreted and delivered data on the distribution and ecology of plants, animals, native plant communities and functional landscapes. These data help prioritize actions to conserve, manage, restore and monitor Minnesota's ecological systems and critical plant and animal habitats. For example MBS data and monitoring efforts inform implementation and outcomes of plans for sustainable prairie, forest and watershed management. MBS data are used to help target high quality landscapes for parks and natural areas by entities such as counties and lakeshore associations. MBS has documented the most recent benchmark data on many of the elements of the state's native biological resources now being used in vulnerability assessments related to changes in Minnesota's landscape.

Surveys will continue in northern Minnesota to move towards completion of the statewide baseline data collection. Monitoring will be expanded at targeted locations in the state to measure the effectiveness of management and conservation efforts and to work with others to establish permanent reference plots.

Museums providing repositories for MBS plant and animal collections are important partners in the coordination of related database development. MBS species and vegetation databases are also part of national information system networks and this project period includes several opportunities for significant collaborative updates to those efforts. Improved access and delivery of MBS data continues to be a priority. Delivery through web-based products, publications, and professional technical assistance is an important outcome of this project period. Decision support systems that provide analytical tools to assess multivariate data will be explored to integrate MBS data with other data to optimize conservation goals.

III. PROJECT STATUS UPDATES:

Project Status as of January 31, 2014

Project Status as of October 31, 2014

Project Status as of March 31, 2015

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Field Surveys

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, planning, research, and critical habitat acquisition.

Data review and Survey site identification (see Map): 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 MBS sites and species habitats for targeted surveys.

Coordination: Staff notify and coordinate activities when possible with other divisions within the DNR, universities, counties, municipalities, surveys and monitoring efforts of 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 MBS 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 continue to 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).

Summary Budget Information for Activity 1:

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

Activity Completion Date:

**Overall budget estimate based on past MBS projects*

Outcome (see also attached map-subsection referenced by letter)	Completion Dates	Budget*
1. Field survey Lake County: Border Lakes subsection	Fall 2013	
2. Field survey St Louis County: Border Lakes subsection	Continue	
3. Field survey St Louis County: Tamarack Lowlands subsection	Fall 2014	
4. Field survey St Louis County: Littlefork-Vermillion Uplands subsection	Fall 2015	
5. Field survey: Beltrami & Clearwater counties (all subsections)	Fall 2015	
6. Field survey Lake of the Woods County (all subsections)	Continue	
7. Field survey Koochiching County (all subsections)	Continue	

Activity Status as of January 31, 2014

Activity Status as of October 31, 2014

Activity Status as of March 31, 2015

Final Report Summary: A final report will be submitted between June 30 and August 1 2015

ACTIVITY 2: Monitoring

Description:

MBS will conduct selected monitoring activities in collaboration with others in response to needs identified in various plans and assessments. Monitoring needs have been highlighted in a number of recent initiatives such as the Minnesota Prairie Conservation Plan: A Habitat Plan for Native Prairie, Grassland, and Wetlands in the Prairie Region of Western Minnesota (Minnesota Prairie Plan Working Group 2011) and the associated Implementation plan (2013-2017); the State of Minnesota’s Forest Certification process (DNR 2005); the revision of the State’s Wildlife Action Plan (DNR 2006); and the State’s Watershed Framework for environmental improvement and conservation. Monitoring of outcomes complement many of the critical land protection goals identified in the Statewide Conservation and Preservation Plan (2008).

A number of sites were selected for monitoring of plant and animal species in 2011 associated with Forest Certification. In conjunction with work proposed related to the current State Wildlife Grant, MBS native plant communities and selected rare plant and animal populations will continue to be monitored in selected locations.

The establishment of permanent vegetation sampling plots that document the “central concept” of vegetation classes as described in *Minnesota's Native Plant Community Classification (Version 2.0)* will continue with a geographic focus in southeastern and northeastern forested landscapes and the rare, but significant forests of southwestern Minnesota. Historic vegetation monitoring sites were re-sampled in the Patterned Peatlands in the previous biennia. Additional sites and monitoring protocol will be considered as work continues in this large landscape. The State’s Watershed Framework for environmental improvement and conservation is in the process of identifying selected lakes where MBS will collaborate in vegetation monitoring efforts.

In the prairie region, monitoring will continue 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. In a number of recent plans including the Minnesota Prairie Conservation Plan, the Aspen Parkland Important Bird Area and the State Wildlife Action Plan guidance is provided for the identification of measures of successful conservation and management. Prairie vegetation sampling and species survey protocols have been implemented and are a proposed to continue in 3-5 prairie landscape areas to assess specific fire and grazing management activities.

Monitoring began in 2011 of populations of small white lady’s-slipper (*Cypripedium candidum*), an orchid species identified as an important ecosystem measure in the Minnesota Prairie Conservation Plan. This species is listed as a state special concern plant. Minnesota harbors the world’s largest populations of this orchid which inhabits high quality prairie and wetlands, some of which are associated with groundwater discharge zones, making it a candidate for one measure of watershed health that considers groundwater resources. In the Prairie Parkland Province, monitoring will be continued at selected high-quality prairie/wetland sites containing populations of small white lady’s-slipper.

Summary Budget Information for Activity 2:

ENRTF Budget: \$ 300,000
Amount Spent: \$ 0
Balance: \$ 300,000

Activity Completion Date:

**Overall budget estimate based on past MBS projects*

Outcome (see also attached map)	Completion Dates	Budget*
1. Identify permanent vegetation sampling plots	January 2014	
2. Sample selected permanent vegetation plots	2013 (10); 14 (20)	
3. Sample up to 5 prairie sites to assess specific management activities	Continue	
4. Monitoring of sensitive prairie plant species	Continue	
5. Sample selected sites related to sustainable forest management	Continue	

Activity Status as of January 31, 2014

Activity Status as of October 31, 2014

Activity Status as of March 31, 2015

Final Report Summary: A final report will be submitted between June 30 and August 1 2015

Activity 3: Information System Expansion

Description:

MBS will provide 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 MBS 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, MBS sites, native plant community polygons (GIS), and animal aggregations. Locations of native plant communities and MBS 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 MBS 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 biodiversity 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 (scanned) 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. MBS 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.

MBS 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. An installation of NatureServe’s Biotics (Biotics 5) that was delayed during 2012 will be completed.

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 3:

ENRTF Budget: \$ 870,000
Amount Spent: \$ 0
Balance: \$ 870,000

Activity Completion Date:

**Overall budget estimate based on past MBS projects*

Outcome	Completion Dates	Budget*
1. Survey data entered and managed in DNR’s information systems	Continue	
2. Preparation & delivery of plant & animal collections to museums	Continue	
3. Monitoring data entered and analyzed (DNR Info Systems)	Continue	
4. Programming to improve long-term data storage, analytical tools, & data transfer	Continue	

Activity Status as of January 31, 2014

Activity Status as of October 31, 2014

Activity Status as of March 31, 2015

Final Report Summary: A final report will be submitted between June 30 and August 1 2015

Activity 4: Guidance for Conservation and Management

Description:

MBS will provide interpretation of results through products and technical assistance to guide conservation and management of ecological systems, rare resources, and sites of biodiversity significance.

This activity includes website development; book publications; participation in conservation and management planning and implementation efforts; delivery of information to agencies, landowners and tribal organizations; updates to policy changes such as the state list of endangered and threatened species; and monitoring of management activities. (See also dissemination section).

As part of the State’s Watershed Plan Framework, decision support systems (DSS) are being utilized to assess ecological data in combination with social and economic data to achieve realistic conservation goals within a specific watershed. The use of this tool will be explored to integrate MBS data within a selected project area and to identify high quality reference lakes to inform both conservation and monitoring activities.

Summary Budget Information for Activity 4:

ENRTF Budget: \$ 580,000

Amount Spent: \$ 0

Balance: \$580,000

Activity Completion Date:

**Overall budget estimate based on past MBS projects*

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)	Improved data portals for:-Vegetation plot data (2013), MBS site data (2014). Add GIS data for at least two counties to the Data Deli (2014). Contribute to DNR native plant community integration project (2015) Contribute biodiversity data to DNR lake websites for up to 200 lakes. Update Rare Species Guide for up to 50 species by 2015 pending revision of the state list of endangered and threatened plants.	
2. Ecological Evaluations (EE) are reports describing attributes of sites of biodiversity significance to guide conservation, management & monitoring	Write 5 EEs (Winter 2013) Write 10 EEs (Winter 2014)	
3. Prairie & forest monitoring preliminary results delivered	See outcomes for Activity 2	
4. Technical assistance: e.g. Forest Service planning, restoration of native plant communities, peatland conservation etc.	Throughout project period	
5. Aspen Parkland-Red River Valley guide book	Publication by June 2014	
6. Two projects related to the State’s Watershed Plan Framework will utilize a DSS to inform watershed plan implementation and identification of reference lakes.	June 2015	

Activity Status as of January 31, 2014

Activity Status as of October 31, 2014

Activity Status as of March 31, 2015

Final Report Summary: A final report will be submitted between June 30 and August 1 2015

V. DISSEMINATION:

Description:

MBS 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, MBS 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. MBS regularly provides vegetation plot data from the relevé database to researchers at academic institutions, other agencies and organizations. 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/nhnrp/nhis.html>

MBS 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 MBS sites, native plant community field guides, and guides to sampling techniques such as vegetation plot data collection using the relevé method. MBS 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. MBS has published several books and field guides and the publication of a natural history book based on MBS 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 MBS methodologies and results to a wide range of audiences including county boards, local planning groups, citizen advisory groups, other biologists, land managers, and students. MBS 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 MBS results. MBS 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.

Status as of January 31, 2014

Status as of October 31, 2014

Status as of March 31, 2015

Final Report Summary: A final report will be submitted between June 30 and August 1 2015

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget:

Budget Category	\$ Amount	Explanation
Personnel:	\$ 2,117,530	Biologists, Ecologists for surveys, monitoring, technical assistance and interpretation, Information Managers and Officers
Professional/Technical/Service Contracts:	\$ 162,000	Survey and monitoring will require contractual agreements following standard DNR procedures for contract processing for activities such as vegetation sampling. It also includes service level agreements for application development and some other information management system support needs following procedures required by MNIT.
Direct and necessary costs:	\$ 219,699	
Equipment/Tools/Supplies:	\$ 7,771	Field equipment/supplies. Equipment is used from previous survey periods when at all possible (For example-GPS units, canoes, cameras, communication equipment etc.) Electronic field data recorders are improving and will potentially reduce data entry time. Costs are between \$500 and \$1500 per unit. In additions, items such as batteries, collecting materials, paddles, and aerial photography need to be replaced or updated.
Travel Expenses in MN:	\$ 143,000	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 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. 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:	\$2,650,000	

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 four classified staff are directly related to this work program.

A portion of the time of two plant ecologists (2.00 FTE) is directed to the authorship of the Aspen Parkland-Red River Valley natural history/guide book that is specifically identified in Activity #4. 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.

A botanist (1.0 FTE) is needed to verify identification of plants collected by MBS botanists and plant ecologists, to coordinate with the repositories of these collections (herbaria), to help plant monitoring and to assist with the update of the rare plant species guide identified in Activity #4. Some of the botanist’s previous responsibilities have been assigned to others or are included in projects that have been completed or eliminated from Divisional priorities. Another data manager (.2FTE) is a specialist in botany needed for MBS plant data entry.

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

NA

Number of Full-time Equivalent (FTE) estimated to be funded with this ENRTF appropriation: 14.6 FTE are proposed to be funded each of the two years described in this work program.

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,	\$	Office rent, salary of supervisor
Heritage Enhancement Account (Lottery-in-lieu) and RIM Critical	\$1,162,000		Salaries, contracts, supplies, office rent
TOTAL OTHER FUNDS:	\$2,082,000	\$	

VII. PROJECT STRATEGY:

A. Project Partners: The following are some of the primary partners related to this project: The Bell Museum, the Science Museum, the Superior National Forest, and Voyageurs National Park. 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) and acceleration of the identification of exemplary aquatic landscapes (lakesheds, watersheds, groundwater systems). **2) Re-Survey** of landscapes altered due to habitat fragmentation, development, and invasive species, especially where MBS was conducted in the 1980s–1990s. **3) Additional 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, sustainable forest management, 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	FY08-09	FY 2010-11	FY 2012-13
ENRTF	1,500,000 <i>Subd.6a</i>	2,100,000 <i>Subd.3a</i>	2,250,000 <i>Subd.(03a)</i>
General Fund	700,000	700,000	520,000
State Wildlife Grant	400,000	500,000	500,000
Heritage Enhancement	1,159,000	1,159,000	934,000
RIM Critical Habitat			226,500

VIII. ACQUISITION/RESTORATION LIST: NA

IX. MAP: (see attached)

X. RESEARCH ADDENDUM: NA

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted not later than January 31, 2014, October 31, 2014, and March 31, 2015. A final report and associated products will be submitted between June 30 and August 15, 2015 as requested by the LCCMR.

Attachment A: Budget Detail for M.L. 2013 Environment and Natural Resources Trust Fund Projects

Project Title: Minnesota Biological Survey
Legal Citation: M.L. 2013 Chp. xx Subd.xx
Project Manager: Carmen Converse
M.L. 2013 ENRTF Appropriation: \$ 2,649,000
Project Length and Completion Date: 06/30/ 2015
Date of Update: 11/2/2012

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Balance	Activity 2 Budget	Amount Spent	Balance	Activity 3 Budget	Amount Spent	Balance	Activity 4 Budget	Amount Spent	Balance	TOTAL BUDGET	TOTAL BALANCE
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BUDGET ITEM	Field Surveys			Monitoring			Information Systems							
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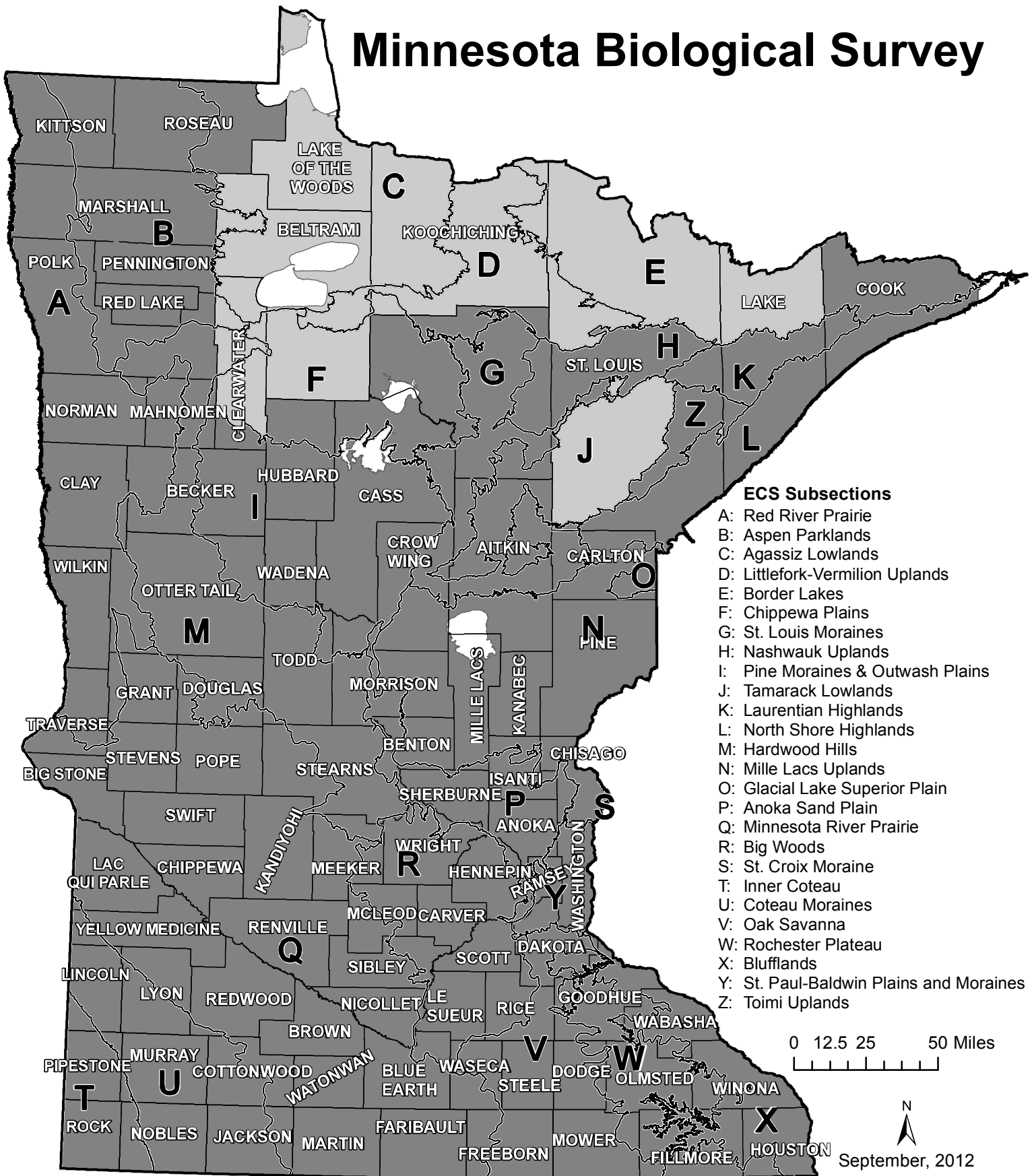
Personnel: (17 positions;14.6 FTE proposed for each of the two fiscal years of the project). These are State of MN employees. Salary and fringe are included in this budget item. Most positions require specialized professional skills in plant and animal surveys (understanding of taxonomy, behavior, field survey techniques, statistics, sampling design, specimen preparation and documentation/data management). In addition, use of remote-sensing equipment, interpretation of aerial imagery, understanding of soils, geology, hydrology, and landscape processes are critical to accomplishing many required tasks. Staff skills focused on the communication of results is especially needed during this project period to meet deadlines for web-based, published products and technical assistance.

	\$680,230	\$0	\$680,230	\$218,000	\$0	\$218,000	\$798,250	\$0	\$798,250	\$421,050	\$0	\$421,050	\$2,117,530	\$2,117,530
Botanist: \$166,000 (1 classified @100% time)														
Botanists: \$274,000 (2 unclassified @100% time)														
Ecologists: \$333,000 (2 classified @100% time)														
Ecologist: \$85,000 (1 unclassified @80% time)														
Ecologists: \$949,700 (7 unclassified @100% time)														
Information officer: \$140,000 (1 unclassified @90% time)														
Information GIS manager: \$129,000 (1 classified @50% time)														
Data manager: \$21,530 (1 classified @20% time)														
student worker: \$18,500 (1 @20% time)														
Professional/Technical/Service Contracts:														
TBD: Survey, monitoring, assessment	\$20,000	\$0	\$20,000	\$35,000	\$0	\$35,000							\$55,000	\$55,000
TBD: Information system products										\$107,000	\$0	\$107,000	\$107,000	\$107,000
Direct and Necessary Services for the Appropriation	\$80,999	\$0	\$80,999	\$15,000	\$0	\$15,000	\$71,750	\$0	\$71,750	\$51,950	\$0	\$51,950	\$219,699	\$219,699
Equipment/Tools/Supplies: Field supplies to conduct biological surveys, including GPS units, data recorders, cameras, communication safety equipment (especially in Border Lakes and remote peatlands), plant and animal specimen collecting and preservation supplies, water chemistry sampling supplies, batteries, air photos, maps, water resistant note books, etc.	\$5,771	\$0	\$5,771	\$2,000	\$0	\$2,000							\$7,771	\$7,771
Travel: In-state travel, including food and lodging expenses when in travel status. Especially used by field staff where vehicle mileage is paid for temporary use of DNR vehicles during the summer field surveys. Vehicles are often trucks due to need for access to remote locations and the need to transport canoes and kayaks (especially for aquatic plant surveys and surveys in Border Lakes, including the Boundary Waters Canoe Area Wilderness). Aerial flights also used (especially in large peatlands).	\$113,000	\$0	\$113,000	\$30,000	\$0	\$30,000							\$143,000	\$143,000
COLUMN TOTAL	\$900,000	\$0	\$900,000	\$300,000	\$0	\$300,000	\$870,000	\$0	\$870,000	\$580,000	\$0	\$580,000	\$2,650,000	\$2,650,000

11/14/2012

Subd. 03a
ENRTF ID: 082-E1

Minnesota Biological Survey



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 Moraine
- T: Inner Coteau
- U: Coteau Moraines
- V: Oak Savanna
- W: Rochester Plateau
- X: Blufflands
- Y: St. Paul-Baldwin Plains and Moraines
- Z: Toimi Uplands

0 12.5 25 50 Miles



September, 2012

Survey completed
1987-June, 2013

Survey in progress
July, 2013-2015