



## Environment and Natural Resources Trust Fund M.L. 2011 Work Plan

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**Date of Status Update:****Date of Next Status Update:** 1/1/2012**Date of Work Plan Approval:** 8/11/2011**Project Completion Date:** 6/30/2015**Is this an amendment request?** \_\_\_\_\_

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**Project Title: Updating National Wetland Inventory for Minnesota - Phase III****Project Manager:** Steve Kloiber**Affiliation:** MN DNR**Address:** 500 Lafayette Rd, Box 25**City:** St Paul **State:** MN **Zipcode:** 55155**Telephone Number:** (651) 296-1811**Email Address:** [steve.kloiber@state.mn.us](mailto:steve.kloiber@state.mn.us)**Web Address:** [http://www.dnr.state.mn/eco/wetlands/nwi\\_proj.html](http://www.dnr.state.mn/eco/wetlands/nwi_proj.html)

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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)

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**Total ENRTF Project Budget:****ENRTF Appropriation \$:** 1,500,000**Amount Spent \$:** 0**Balance \$:** 1,500,000

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**Legal Citation:** M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 03d**Appropriation Language:**

\$1,500,000 the second year is from the trust fund to the commissioner of natural resources to continue the update of wetland inventory maps for Minnesota. This appropriation is available until June 30, 2015, by which time the project must be completed and final products delivered.

## **I. PROJECT TITLE:** Updating the National Wetland Inventory for Minnesota - Phase III

**II. PROJECT SUMMARY:** Over the past 100 years, about half of Minnesota's original 22 million acres of wetlands have been drained or filled. Some regions of the State have lost more than 90 percent of their original wetlands. Urban development, agricultural drainage, mining, road construction, and utility projects result in additional losses each year (attached figure). The function and quality of remaining wetlands are often impaired. Updating the NWI is a key component of the State's strategy to monitor and assess wetlands in support of efforts to assure healthy wetlands and clean water for Minnesota.

- NWI is the only comprehensive inventory of wetlands for Minnesota. To protect wetlands, we need to know how many wetland acres we have and where they are. We can't manage what we don't measure. Unfortunately, the current NWI is inaccurate in many places because it is 25-30 years out-of-date and some of the original imagery used was relatively coarse scale.
- NWI is an important screening tool for identifying potential wetland impacts. Wetland programs such as Minnesota's Wetland Conservation Act and the US Army Corps' Clean Water Act Permit Program rely on the NWI as the initial resource for identifying potential impacts of proposed projects. Having accurate maps upfront prevents problems later on; saving time and money for permit applicants and wetland program managers as well as preventing wetland impacts.
- NWI is useful for strategic wetland restoration planning. Funds for wetland restoration are limited; therefore, it is important to get the most benefit possible for our restoration dollars. Wetland maps provide useful information for strategic wetland restoration planning. The NWI includes information about partly drained and ditched wetlands that may be potential wetland restoration opportunities. In addition, the updated NWI will provide enhanced attributes to support assessment of ecosystem services. The updated and enhanced NWI will also help target wetland restoration in a way that complements the functions and values of existing wetlands.

This is the third phase of a multi-phase project to update the National Wetland Inventory (NWI) maps for Minnesota using modern, high-resolution imagery and elevation data. The NWI maps need to be updated because the original data are either severely out-of-date or in some instances they were not very accurately mapped in the first place. Benefits of this project include improved accuracy of wetland maps, improved compliance with wetland protection programs, and better wetland and water quality planning.

This project phase will: 1) update NWI maps for 30 counties in southern Minnesota, and 2) acquire aerial imagery data required for subsequent updating of NWI for follow-on phases. The data required for updating the NWI maps for the 30 counties in southern Minnesota is currently being acquired through a previously funded project phase and will be available by 2012. High-resolution elevation data are being acquired through a separate project. Wetland maps and aerial imagery will be produced by contractors under the supervision of the DNR. All wetland map data and aerial imagery will be available free of charge to the public. The University of Minnesota will assist in this effort by collecting independent field validation data for wetlands.

Funding for this project will become available on July 1, 2012 (start of FY13). No project activities will occur before this. The funding will be available through June 30, 2015 (end of FY15) at which time all project activities will be complete.

## **III. PROJECT STATUS UPDATES:**

### **Project Status as of January 2013:**

**Project Status as of July 2013:**

**Project Status as of January 2014:**

**Project Status as of July 2014:**

**Project Status as of January 2015:**

**Final Report July 2015:**

#### **IV. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1:** Updated Wetland Maps for Southern Minnesota

**Description:** Produce updated wetland maps for 18,000 square miles within 30 counties in southern MN (attached map). The map production will be conducted by contractors under the supervision of the DNR and will be based on recommendations for wetland mapping developed by the University of Minnesota through a previous phase of this project. This work will consist of digital photo-interpretation, topographic analysis of LiDAR data, and analysis of ancillary data such as soils maps and forest inventory maps, as well as quality control review. Completed digital map data will be available to the public through several websites, including the DNR and the U.S. Fish and Wildlife Service.

**Summary Budget Information for Activity 1:**

**ENRTF Budget: \$ 912,000**  
**Amount Spent: \$ 0**  
**Balance: \$ 912,000**

**Activity Completion Date:**

<b>Outcome</b>	<b>Completion Date</b>	<b>Budget</b>
1. Data preprocessing and preliminary wetland probability map for 30 counties in southern MN		\$ 112,000
2. Wetland map production for 30 counties in southern MN	12/2014	\$ 800,000

**Activity Status as of January 2013:**

**Activity Status as of July 2013:**

**Activity Status as of January 2014:**

**Activity Status as of July 2014:**

**Activity Status as of January 2015:**

**Final Report July 2015:**

**ACTIVITY 2:** Data Acquisition for Phase 4 (Central Minnesota)

**Description:** This component will include acquisition of imagery along with field verification data for the next anticipated mapping phase in central Minnesota. We will acquire high-resolution, spring leaf-off, multi-spectral aerial photography for 22 counties (attached map). The imagery will be used as a base for updating the NWI maps for central Minnesota. Data acquisition will also include a field-based assessment of wetland type for 400 to 500 sites chosen using a stratified random selection process. The field data will be used to assess the accuracy of the wetland maps developed from remote sensing

data. To maintain the independence of the field data, the field data acquisition will be managed by the University of Minnesota, Remote Sensing and Geospatial Analysis Laboratory and the data will not be shared with the mapping contractor.

**Summary Budget Information for Activity 2:**

**ENRTF Budget: \$ 588,000**  
**Amount Spent: \$ 0**  
**Balance: \$ 588,000**

**Activity Completion Date:**

<b>Outcome</b>	<b>Completion Date</b>	<b>Budget</b>
<i>1. Acquisition of spring, high-resolution, digital aerial imagery for 22 counties in Central MN</i>	12/2013	\$ 95,000
<i>2. Field validation data acquisition for 22 counties in Central MN</i>	09/2014	\$ 493,000

**Activity Status as of January 2013:**

**Activity Status as of July 2013:**

**Activity Status as of January 2014:**

**Activity Status as of July 2014:**

**Activity Status as of January 2015:**

**Final Report July 2015:**

**V. DISSEMINATION:**

**Description:** The plan for disseminating the project results primarily relies on distribution of the wetland maps through web-based data distribution hubs and online viewing of wetland maps through web mapping applications. Primary data access websites for the State of Minnesota include the [DNR Data Deli](#) and the [MN Geographic Data Clearinghouse](#). The primary online mapping application for viewing the data will be [DNR Landview](#). Furthermore, the data are likely to be picked up and served by other sites and applications beyond the ones listed here. Publicity for this effort will include presentations at professional conferences as well as publication in selected newsletters and journals. Conference presentations will include at least two of the following venues; the Minnesota Water Resources Conference, the Minnesota GIS/LIS Conference, the Annual Minnesota Wetlands Conference, and the Conference of the Minnesota Association of Watershed Districts.

**Status as of January 2013:**

**Status as of July 2013:**

**Status as of January 2014:**

**Status as of July 2014:**

**Status as of January 2015:**

**Final Report July 2015:**

**VI. PROJECT BUDGET SUMMARY:**

**A. ENRTF Budget:**

<b>Budget Category</b>	<b>\$ Amount</b>	<b>Explanation</b>
Personnel:	\$ 139,000	DNR project manager, 0.65 FTE for 2 yrs, unclassified
Professional/Technical Contracts:	\$ 1,356,000	Aerial photography, data processing/modeling, wetland map production, field data acquisition
Equipment/Tools/Supplies:	\$ 2,000	Field supplies (GPS batteries, insect repellent, sunscreen, protective equipment, paint for photo control points). Office supplies/equipment (printing, shipping, digital storage media)
Travel Expenses in MN:	\$ 3,000	In-state mileage, lodging and travel expenses for project coordination and outreach meetings.
<b>TOTAL ENRTF BUDGET:</b>	<b>\$ 1,500,000</b>	

**Explanation of Use of Classified Staff:** NA

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

**Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation:** 0.65-FTE for two years – 1.3 FTE total

**B. Other Funds:**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
<b>Non-state</b>			
	\$0	\$0	
<b>State</b>			
General fund and other funds as appropriate	\$120,340	\$0	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.
<b>TOTAL OTHER FUNDS:</b>	<b>\$120,340</b>	<b>\$0</b>	

The DNR and its partners will also provide approximately \$20,000 of in-kind staff time in support of this project (but not tracked for reporting purposes). Other sources of funding for this project phase have not been identified at this stage. However, based on previous project phases, we anticipate that additional funding from other sources will likely become available as we begin to initiate activities for this project phase, especially for aerial imagery acquisition. See spending history section for further details.

**VII. PROJECT STRATEGY:**

**A. Project Partners:** The University of Minnesota, Remote Sensing and Geospatial Analysis Laboratory will receive \$88,000 for Activity 2 (field data acquisition). Other partners providing in-kind services for this project include the Minnesota Pollution Control Agency, the Minnesota Board of Water and Soil Resources, the U.S. Fish and Wildlife Service, and the Minnesota Dept. of Administration’s Geographic Information Office.

**B. Project Impact and Long-term Strategy:** This is the third phase of a multi-phase project to update the NWI for the entire state of Minnesota. We anticipate initiating a new phase every other year for two additional phases. The estimated total budget for the project is \$7.5 million. With this appropriation, the total amount received from ENTRF to date will be \$3,150,000 (42% of the estimated total project budget). Upon completion of this phase, our progress will be approximately 75% completion for imagery and field data acquisition and about 30% completion for wetland mapping.

**C. Spending History:**

Funding Source	M.L. 2008 or FY 2009-10	M.L. 2010 or FY 2011-12
ENTRF	\$550,000 Chap. 367, Sec. 2, Subd. 5a	\$1,100,000 Chap. 362, Sec. 2, Subd. 3b
USGS/NGA	\$25,000	
St. Louis County	\$24,999	
MPCA Clean Water Legacy	\$111,000	
DNR – Heritage Enhancement Fund	\$ 181,064	
DNR/NOAA – Coastal Zone Program	\$ 24,227	
USGS/NGA	\$75,000	
Metropolitan Council	\$ 65,750	
Metropolitan Mosquito Control District	\$ 7,000	
McLeod County		\$24,000

Sibley County		\$29,000
Murray County		\$35,000

**VIII. ACQUISITION/RESTORATION LIST: NA**

**IX. MAP(S): NA**

**X. RESEARCH ADDENDUM: NA**

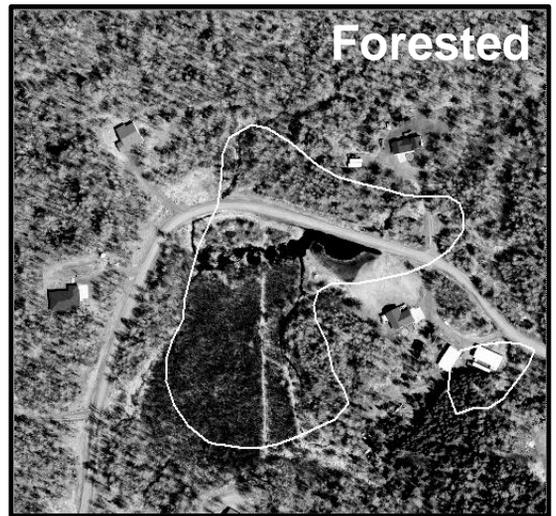
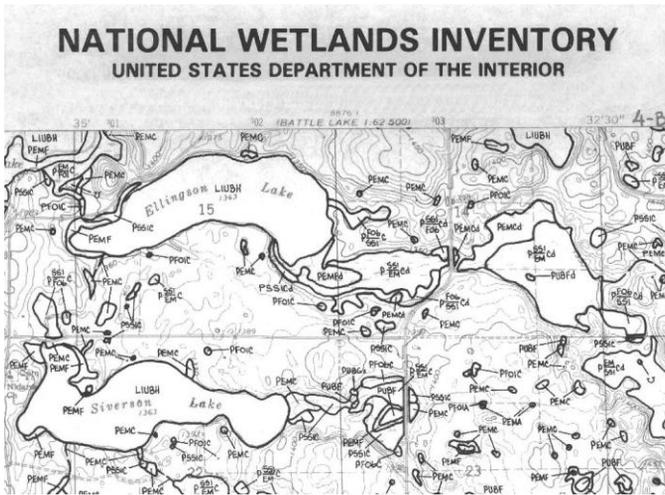
**XI. REPORTING REQUIREMENTS:**

**Periodic work plan status update reports will be submitted not later than January 31, 2013, June 30, 2013, January 31, 2014, June 30, 2014, January 31, 2015 and June 30, 2015. A final report and associated products will be submitted between June 30 and August 1, 2015 as requested by the LCCMR.**

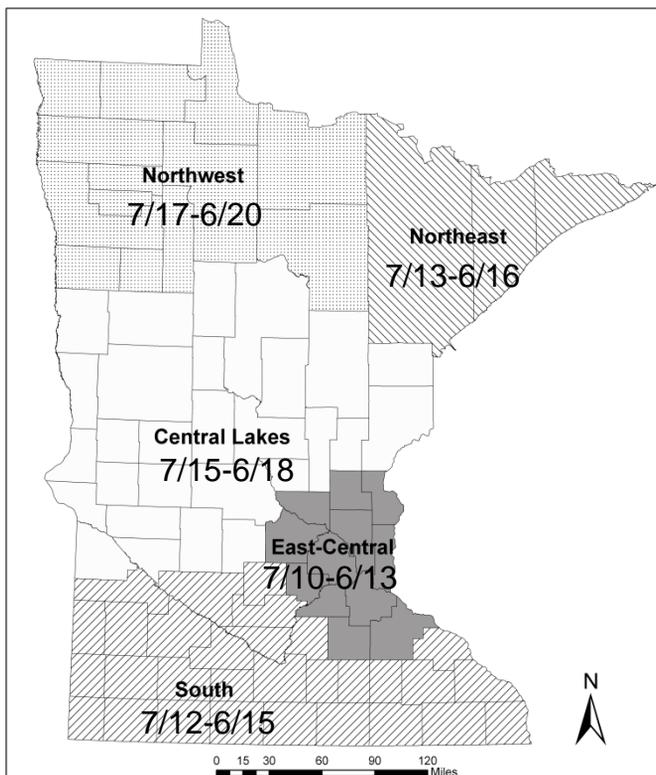
Attachment A: Budget Detail for M.L. 2011 (FY 2012-13) Environment and Natural Resources Trust Fund Projects								
<b>Project Title:</b> <i>Updating the National Wetland Inventory for Minnesota - Phase III</i>								
<b>Legal Citation:</b> <i>Fill in your project's legal citation from the appropriation language</i>								
<b>Project Manager:</b>								
<b>M.L. 2011 (FY 2012-14) ENRTF Appropriation:</b> \$ 1,500,000								
<b>Project Length and Completion Date:</b> <i>June 30, 2015</i>								
<b>Date of Update:</b> <i>June 27, 2011</i>								
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Balance	Activity 2 Budget	Amount Spent	Balance	TOTAL BUDGET	TOTAL BALANCE
<b>BUDGET ITEM</b>	<b>Wetland Mapping</b>			<b>Data Acquisition</b>				
<b>Personnel (Wages and Benefits)</b>								
Steve Kloiber, Project Manager \$139,000 (78% salary, 22% benefits); 0.65FTE for 2 years	\$ 97,300	\$ -	\$ 97,300	\$ 41,700	\$ -	\$ 41,700	\$ 139,000	\$ 139,000
<b>Professional/Technical Contracts</b>								
TBD (competitive bid): Aerial Imagery Acquisition				\$ 456,000	\$ -	\$ 456,000	\$ 456,000	\$ 456,000
DNR Resource Assessment Office (fee for service office): Data Preprocessing and Wetland Modeling	\$ 100,000	\$ -	\$ 100,000				\$ 100,000	\$ 100,000
TBD (competitive bid): Wetland Inventory Map Production	\$ 712,000	\$ -	\$ 712,000				\$ 712,000	\$ 712,000
University of Minnesota, Remote Sensing and Geospatial Analysis Laboratory -- for field validation data acquisition and quality control consulting.				\$ 88,000	\$ -	\$ 88,000	\$ 88,000	\$ 88,000
<b>Equipment/Tools/Supplies</b>								
Field supplies (GPS batteries, insect repellent, sunscreen, protective equipment, paint for photo control points)	\$ 600	\$ -	\$ 600	\$ 800	\$ -	\$ 800	\$ 1,400	\$ 1,400
Office supplies/equipment (printing, shipping, digital storage media)	\$ 300	\$ -	\$ 300	\$ 300	\$ -	\$ 300	\$ 600	\$ 600
<b>Travel expenses in Minnesota</b>	\$ 1,800	\$ -	\$ 1,800	\$ 1,200	\$ -	\$ 1,200	\$ 3,000	\$ 3,000
In-state mileage, lodging and travel expenses for project coordination and outreach meetings.								
<b>Other</b>								
<b>COLUMN TOTAL</b>	<b>\$912,000</b>	<b>\$0</b>	<b>\$912,000</b>	<b>\$588,000</b>	<b>\$0</b>	<b>\$588,000</b>	<b>\$1,500,000</b>	<b>\$1,500,000</b>

The original NWI maps for Minnesota were developed 25 to 30 years ago as hard copy paper maps.

Examples of inaccuracies in the original NWI maps resulting from development are shown on top of modern aerial photos.



NWI update schedule by geographic region



The NWI will be updated using modern, high-resolution digital imagery, digital elevation data from LiDAR, and the best-available ancillary GIS data.

# Schedule for the National Wetland Inventory Update

## Mapping Region

East-Central

South

Northeast

Central Lakes

Northwest

FY09-11  
\$550,000  
Approp.  
ML2008  
367/2/5a

Acquire Input Data  
- Imagery  
- Field Data

Acquire Input Data

FY11-13  
\$1,100,000  
Approp.  
ML2010  
362/2/3b

Map Production  
- Preprocessing  
- Delineation  
- Classification

Quality Review  
- Inspection  
- Automated Checks  
- Error Analysis

Data Delivery  
- Web Servers  
- Web Maps  
- Outreach

Acquire Input Data

FY13-15  
\$1,500,000  
Recomm.

Map Production

Quality Review

Data Delivery

Acquire Input Data

FY14-16  
\$1,630,000  
Future

Map Production

Quality Review

Data Delivery

Acquire Input Data

FY16-18  
\$1,760,000  
Future

Map Production

Quality Review

Data Delivery

FY18-20  
\$1,580,000  
Future

Map Production

Quality Review

Data Delivery

