

## Environment and Natural Resources Trust Fund (ENRTF) 2010 Work Program

**Date of Report:** November 16, 2009  
**Date of Next Progress Report:** January 31, 2011  
**Date of Work Program Approval:**  
**Project Completion Date:** June 30, 2013

**I. PROJECT TITLE:** Updating the National Wetlands Inventory for Minnesota:  
Phase 2 (019-A3)

**Project Manager:** Steve Kloiber  
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**Location:** This phase of the project focuses on updating the National Wetland Inventory (NWI) maps for a 13-county area in east-central Minnesota surrounding the greater metropolitan region of Minneapolis and St. Paul (figure 1). This phase includes a pilot study to test wetland mapping methods for an as yet unspecified agricultural site in southern Minnesota. In addition, this phase also includes primary imagery acquisition and field validation data collection for southern Minnesota.

<b>Total ENRTF Project Budget:</b>	<b>ENRTF Appropriation</b>	<b>\$1,100,000</b>
	<b>Minus Amount Spent:</b>	<b>\$ 0</b>
	<b>Equal Balance:</b>	<b>\$1,100,000</b>

**Legal Citation:** ML 2010, Chap.[\_\_\_\_], Sec.[\_\_\_\_], Subd.\_\_\_\_\_.

**Appropriation Language:**

**II. PROJECT SUMMARY AND RESULTS:** This is the second phase of a multi-phase project to update the National Wetlands Inventory (NWI) for the state of Minnesota. The overall goal of this project is to improve wetland protection and management in Minnesota by updating wetland inventory maps for the state. The NWI provides critical baseline data that inform many wetland management actions and policies. The NWI data need to be updated because the original data are either severely out-of-date or in some instances they were not very accurately mapped in the first place.

The current project phase will: 1) update maps for 13 counties in east-central Minnesota surrounding the greater Twin Cities metropolitan area (figure 1); 2) evaluate imagery sources and mapping technologies to identify the most cost-

effective, reliable inventory procedures for the agricultural regions of the state; and 3) acquire any additional data (digital aerial imagery and field validation data) required to update wetland inventory maps for southern Minnesota, which will be the next phase of the overall project. The wetland inventory maps for the current phase will be updated using contemporary aerial imagery as well as available high resolution elevation data. Subsequent phases of the statewide wetland inventory update will follow the acquisition of high-resolution elevation data acquired through the Minnesota LiDAR acquisition project. Updated maps and imagery will be made available to the public through the Internet.

**III. PROGRESS SUMMARY AS OF:**

**IV. OUTLINE OF PROJECT RESULTS:**

**RESULT 1: Updating Wetland Maps**

**Description:** This component of the project is devoted to updating the NWI maps for 13 counties in east-central Minnesota surrounding the greater Twin Cities metropolitan area (figure 1). The primary task of map production will be contracted out using the State’s standard competitive bid process. The Minnesota DNR will provide oversight for this effort including contract management, supplying primary input data, approving mapping procedures, reviewing map products for accuracy, coordinating stakeholder involvement, and distributing updated NWI data to the public.

**Summary Budget Information for Result 1:** ENRTF Budget: \$385,000  
Amount Spent: \$ 0  
Balance: \$385,000

Deliverable	Completion Date	Budget
1. Updated digital wetland inventory maps for 13 counties in east-central Minnesota	06/13	\$385,000

**Result Completion Date:** *June 30, 2013*

**Result Status as of January 2011:**

**Result Status as of July 2011:**

**Result Status as of January 2012:**

**Result Status as of July 2012:**

**Results Status as of January 2013:**

**Final Report Summary:**

## RESULT 2: Methods Evaluation

**Description:** The goal of this component of the project is to complete the methods evaluation work that was started under phase one of the overall project. Specifically, this entails completing a pilot test of wetland mapping techniques for a site located in an agricultural setting in southern Minnesota. The methods evaluation aims to help develop high-accuracy, cost-effective procedures for updating NWI maps for the various major landscapes in Minnesota. The agricultural region pilot study is important because it addresses issues that are unique to wetland mapping in an area that is scheduled for update in the next phase of the overall project. This component of the project will be conducted by the University of Minnesota Remote Sensing and Geospatial Analysis Laboratory.

**Summary Budget Information for Result 2:** ENRTF Budget: \$127,000  
Amount Spent: \$ 0  
Balance: \$127,000

Deliverable	Completion Date	Budget
1. Updated wetland maps for pilot area	6/30/11	\$32,400
2. Wetland mapping protocol for southern MN	12/31/11	\$87,200
3. Conduct training on wetland mapping	6/30/12	\$7,400

**Result Completion Date:** *June 30, 2012*

**Result Status as of January 2011:**

**Result Status as of July 2011:**

**Result Status as of January 2012:**

**Final Report Summary:**

## RESULT 3: Data Acquisition

**Description:** Creating a high quality update of the NWI requires having high quality data. This component will include acquisition of imagery along with field verification data for the next anticipated mapping phase in southern Minnesota. We will acquire high-resolution, spring leaf-off, multi-spectral aerial photography for 36 counties (although specifications could change based on recommendations from Result 2). The imagery will be used as a base for updating the NWI maps for southern 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 final wetland maps. To maintain the independence of the field data, the field data acquisition will be managed by University of Minnesota, Remote Sensing and Geospatial Analysis Laboratory and not shared with the mapping contractor.

**Summary Budget Information for Result 3:** ENRTF Budget: \$588,000  
Amount Spent: \$ 0  
Balance: \$588,000

<b>Deliverable</b>	<b>Completion Date</b>	<b>Budget</b>
1. High-resolution, spring leaf-off, multi-spectral digital aerial imagery	09/12	\$500,000
2. Field data acquisition	06/13	\$88,000

**Result Completion Date:** *June 30, 2013*

**Result Status as of January 2011:**

**Result Status as of July 2011:**

**Result Status as of January 2012:**

**Results Status as of July 2012:**

**Result Status as of January 2013**

**Final Report Summary:**

**V. TOTAL ENRTF PROJECT BUDGET:**

**Personnel:** \$ 135,000 (DNR Project Manager – 0.65 FTE unclassified employee)

**Contracts:** \$ 955,000 (Details in Attachment A)

**Equipment/Tools/Supplies:** \$ 1,500 (batteries and accessories for GPS units, spray paint for accuracy assessment targets, etc.)

**Acquisition (Fee Title or Permanent Easements):** \$ NA

**Travel:** \$ 6,000 (\$4,000 for in-state travel for business meetings, field work, and training. \$2,000 for out-state travel for the DNR project manager to attend a professional symposium/workshop regarding current technology for mapping wetlands – American Society of Photogrammetry and Remote Sensing)

**Additional Budget Items:** \$ 500 (printing field manuals, procedures documents, reports, and maps)

**TOTAL ENRTF PROJECT BUDGET: \$1,100,000**

**Explanation of Capital Expenditures Greater Than \$3,500:** None

**VI. PROJECT STRATEGY:**

**A. Project Partners:** Joe Knight, Ph.D., of the University of Minnesota, Remote Sensing and Geospatial Analysis Laboratory will receive a total of \$180,000; \$100,000 for Result 2 (methods evaluation) and \$80,000 for Result 3 (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 second phase of a multi-phase project to update the National Wetlands Inventory (NWI) for the entire state of Minnesota. The NWI provides critical baseline data that inform many wetland management actions and policies. We anticipate submitting proposals every other year for four additional phases (ie. 2012, 2014, 2016, and 2018). The estimated total budget for the project is \$7.5 million. With this project phase, we will have received \$1.65 million (about 22%) from ENTRF. Upon completion of this project phase, we will have completed 100% of the methods evaluation, 50% of imagery and field validation data acquisition for the state, and 10% of the updated wetland maps for the state.

**C. Other Funds Proposed to be Spent During the Project Period:** The DNR and its partners listed above will provide approximately \$20,000 of in-kind staff time in support of this project (but not tracked for reporting purposes). In addition, approximately \$154,000 in Department Operations and Division Support charges accruing to this project will be covered by Division general funds or other eligible Division funds (see Attachment B).

Based on experience from phase one of this project, we also anticipate being able to find matching funds from local, state, and federal agencies for imagery acquisition. Any savings in the ENRTF budget that result from this will be redirected toward updating NWI maps for additional areas and/or acquisition of additional field data to validate the updated maps.

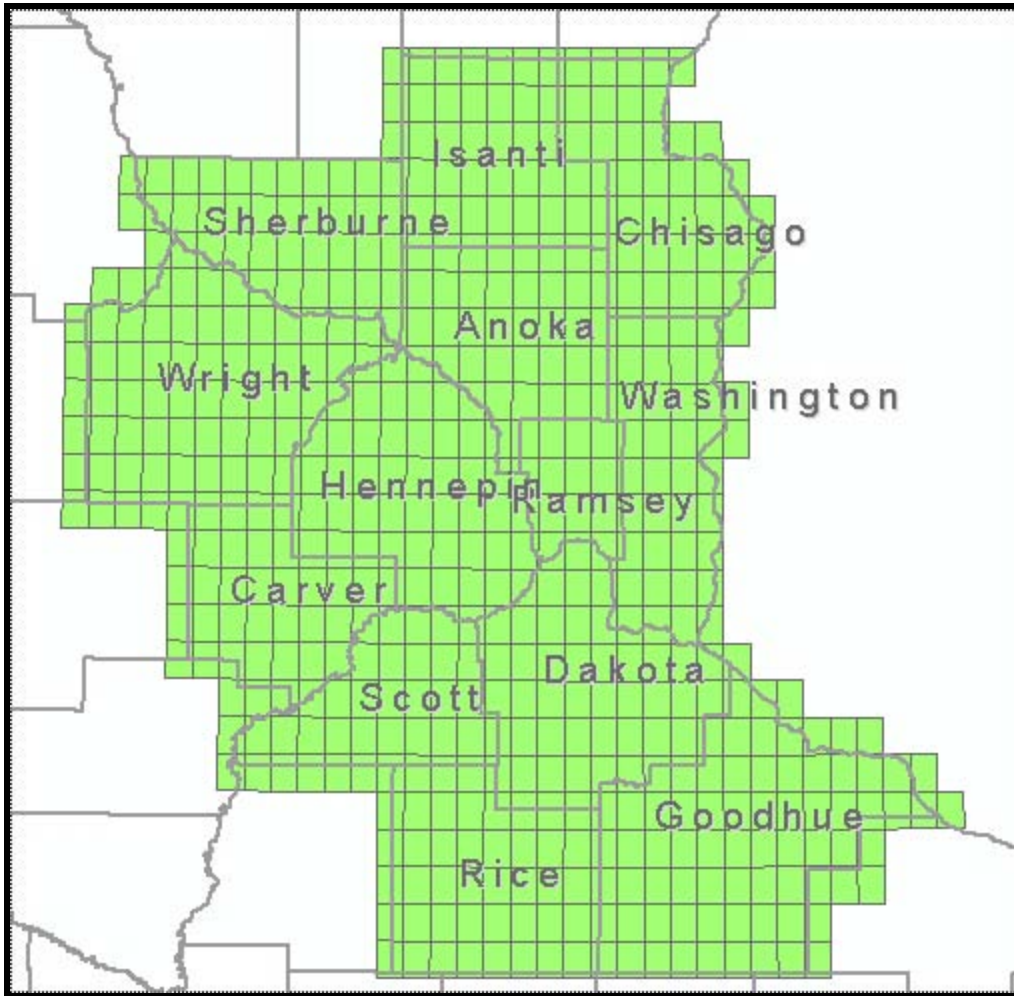
**D. Spending History:** The ENTRF provided \$550,000 for the first phase of this project. The first phase included: 1) developing mapping standards designed to ensure that the final product meets the needs of end users; 2) acquiring high-resolution, leaf-off, color infrared aerial imagery for northeastern and east-central Minnesota; and 3) evaluating imagery sources and mapping technologies to identify the most cost-effective, reliable inventory procedures for pilot study sites in northeastern and east-central Minnesota.

Matching funds for imagery acquisitions included: 1) National Geospatial Intelligence Agency (via U.S. Geological Survey) - \$25,000, 2) St. Louis County Planning Department - \$24,999, 3) Minnesota Pollution Control Agency - \$111,373, 4) National Oceanographic Atmospheric Administration (via DNR Coastal Zone Program) - \$24,227, and 5) DNR - \$181,065. We anticipate that the Metropolitan Council will contribute about half of the cost (about \$70,000) for acquiring imagery for the 13-county, east-central Minnesota project area (the Metropolitan Council will cover the costs for the seven-county region that corresponds to their statutory authority).

**VII. DISSEMINATION:** Updated maps and imagery will be made freely available to the public through the Internet. There will be two main distribution points for the updated data: the DNR Data Deli (<http://deli.dnr.state.mn.us/>) and the U.S. Fish and Wildlife Service's Wetland Mapper (<http://www.fws.gov/wetlands/Data/Mapper.html>). In addition, updated wetland maps will be available through online mapping applications such as DNR Landview (<http://www.dnr.state.mn.us/maps/landview.html>) and Google Earth.

**VIII. REPORTING REQUIREMENTS:** Periodic work program progress reports will be submitted not later than January 2011, July 2011, January 2012, July 2012, and January 2013. A final work program report and associated products will be submitted between June 30 and August 1, 2013 as requested by the LCCMR.

**IX. RESEARCH PROJECTS:**



**Figure 1:** The focus of the first update of NWI will be the 13 counties Metropolitan Area.

Attachment A: Budget Detail for 2010 Projects - Summary and a Budget page for each partner (if applicable)											
Project Title: <i>Updating the National Wetland Inventory for Minnesota: Phase 2 (019-A3)</i>											
Project Manager Name: <i>Steve Kloiber</i>											
Trust Fund Appropriation: <b>\$1,100,000</b>											
1) See list of non-eligible expenses, do not include any of these items in your budget sheet											
2) Remove any budget item lines not applicable											
2010 Trust Fund Budget	<u>Result 1 Budget:</u>	<u>Amount Spent</u> <i>(date)</i>	<u>Balance (date)</u>	<u>Result 2 Budget:</u>	<u>Amount Spent</u> <i>(date)</i>	<u>Balance (date)</u>	<u>Result 3 Budget:</u>	<u>Amount Spent</u> <i>(date)</i>	<u>Balance (date)</u>	<b>TOTAL BUDGET</b>	<b>TOTAL BALANCE</b>
<b>BUDGET ITEM</b>	<i>Updating Wetland Maps</i>			<i>Methods Evaluation</i>			<i>Data Acquisition</i>				
<b>PERSONNEL: wages and benefits</b> <i>(Steve Kloiber 65%FTE - unclassified)</i>	\$54,000		\$54,000	\$27,000		\$27,000	\$54,000		\$54,000	\$135,000	
<b>Contracts</b>											
<b>Professional/technical</b> <i>(selected by RFP, Wetland Mapping)</i>	\$327,000		\$327,000							\$327,000	
<b>Professional/technical</b> <i>(Univ. of MN, Methods Evaluation)</i>				\$100,000		\$100,000				\$100,000	
<b>Professional/technical</b> <i>(Univ. of MN, Field Data Acq.)</i>							\$80,000		\$80,000	\$80,000	
<b>Professional/technical</b> <i>(selected by RFP, Aerial Imagery)</i>							\$450,000		\$450,000	\$450,000	
<b>Printing</b> <i>(procedures, reports, &amp; maps)</i>	\$500		\$500							\$500	
<b>Supplies</b> <i>(field supplies, batteries, GPS accessories, spray paint)</i>	\$500		\$500				\$1,000		\$1,000	\$1,500	
<b>Travel expenses in Minnesota</b> <i>(mileage, per diem, lodging, etc.)</i>	\$2,000		\$2,000				\$2,000		\$2,000	\$4,000	
<b>Travel outside Minnesota</b> <i>(conference/training, see note in workplan)</i>	\$1,000		\$1,000				\$1,000		\$1,000	\$2,000	
<b>COLUMN TOTAL</b>	<b>\$385,000</b>	<b>\$0</b>	<b>\$385,000</b>	<b>\$127,000</b>	<b>\$0</b>	<b>\$127,000</b>	<b>\$588,000</b>	<b>\$0</b>	<b>\$588,000</b>	<b>\$1,100,000</b>	<b>\$0</b>