

**Environment and Natural Resources Trust Fund
2011-2012 Request for Proposals (RFP)**

Subd: 04s

Project Title: Restoration Strategies for Ditched Peatland and Scientific and Natural Areas

Category: C1+2. Protection, Restoration, and Enhancement

Total Project Budget: \$ 200,000

Proposed Project Time Period for the Funding Requested: 3 yrs, July 2011 - June 2014

Other Non-State Funds (secured): \$ 0

Summary:

Evaluate hydrology and habitat of the Winter Road Lake peatland watershed protection area to determine the effects of ditch abandonment and potential restoration on this and other patterned peatlands.

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Sponsoring Organization: DNR

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Location:

Region: NW

Ecological Section: No. Minnesota and Ontario Peatlands (212M)

County Name: Lake of the Woods

City / Township: Noyes and Hiwood Townships

2011-2012 MAIN PROPOSAL

PROJECT TITLE: Restoration Strategies; Ditched Peatland Scientific and Natural Areas

I. PROJECT STATEMENT

This project will evaluate hydrology and habitat of the Winter Road Lake Peatland to determine the effects of ditch abandonment and potential restoration on this peatland and others:

- Determine detailed internal watershed boundaries and patterned peatland features using existing LiDAR data (Light Detecting and Ranging data-planned release date in July 2010);
- Establish a long-term, monitoring network for water levels, flows in the ditches, and vegetation;
- Examine the functional relationship of ditches to their associated drainage systems, affected properties and habitat to determine if ditch abandonment will improve the ecological health of this patterned peatland.

The Winter Road Lake Peatland Scientific and Natural Area (SNA) along with its surrounding Watershed Protection Area (WPA), is located in Lake of the Woods and Roseau counties. It is one of 18 ecologically significant patterned peatlands designated as SNAs by the Minnesota legislature (MS 84.036). The natural hydrologic condition of this high quality peatland was disrupted in the early 1900's by the installation of many drainage ditches and the Norris-Roosevelt Road. Roads block normal flows of water through the peatland, while drainage ditches interrupt surface flow patterns, decrease near-surface water levels and change the amounts and timing of spring runoff and other surface water flows. Resulting hydrologic and habitat changes degrade the ecological integrity of the peatland, negatively impact species of greatest conservation need (SGCN), cause flooding in the basin, and impact the human-built environment. The recently completed management plan for this SNA recommends further evaluation of the existing drainage ditch and road systems to assess opportunities for restoring peatland hydrology and habitat.

We will determine the conditions for successful ditch abandonment and investigate the appropriate ditch abandonment methods for this and similar peatland areas along with determining the potential for wetland banking credits post restoration. We will develop improved peatland management practices and monitoring guidelines for implementation in this and other peatlands statewide. Public land administrators, regulators and watershed districts will have the tools to evaluate ditch effects on hydrology and habitat, analyze the viability of the habitat for SGCNs, make changes to improve habitat, and monitor to ensure that project goals are achieved and maintained.

II. DESCRIPTION OF PROJECT ACTIVITIES

Total Budget: \$ 200,000

Activity 1: Hydrologic Assessment and Monitoring of the SNA/WPA

Budget: \$ 144,940

Establish and map internal watershed boundaries and conceptual water budgets using available LiDAR data. Install and maintain automated gaging sites which will measure precipitation, groundwater levels and water velocity in the adjacent ditch. Install and monitor piezometers in vegetation monitoring sites and take synoptic surface water measurements. Data will be used to evaluate existing hydrologic conditions and potential benefits and locations of ditch abandonment.

Outcome	Completion Date
1. Establish internal watershed boundaries (map) and conceptual water budgets.	9/30/2011
2. Install (by 11/31/2011) and maintain three (3) automated precipitation, groundwater and ditch gaging stations with satellite telemetry.	5/31/2013
3. Install wells at each vegetation monitoring plot for synoptic groundwater level measurements.	10/31/2011
4. Conduct annual synoptic surface water flow measurements at eight (8) sites four (4) times per year.	5/31/2013
5. Compile collected data and report the results with a determination of the peatland water budget.	5/31/2013

Activity 2: Vegetative Assessment and Monitoring of the SNA/WPA

Budget: \$ 13,400

Conduct vegetation evaluation and collection at vegetative plots twice per year to evaluate existing habitat and determine ditching effects on existing habitat.

Outcome	Completion Date
1. Plot-based quantitative vegetation and bryophyte sampling, and synoptic groundwater level measurements conducted at ten (10) sites to coincide with the synoptic groundwater level measurements.	10/31/2012
2. Compile collected data and report the results.	5/31/2013

Activity 3: Peatland Hydrology and Vegetation Restoration Alternatives of the SNA/WPA

Budget: \$41,660

Review and analyze data to determine potential restoration methods including ditch blocking and vegetation establishment/management. Evaluate appropriate ditch blocking design, frequency, and materials based on site conditions, desired hydrology and material availability as it relates to habitat improvement. Evaluate the need to establish, restore or manage vegetation to achieve the desired habitat (report). Conduct a preliminary analysis to determine the potential for wetland mitigation credits.

Outcome	Completion Date
1. Review ditch plans, conduct ditch profiling as needed, review potential hydrologic and restoration methods.	9/30/2012
2. Analyze preliminary results, research and make preliminary recommendations for habitat improvements.	1/31/2013
3. Analyze final results, research and make final recommendations for habitat improvements in a final report.	6/30/2013
4. Prepare preliminary information and analysis necessary for potential ditch abandonment, wetland banking, permitting and other regulatory processes in a report.	6/30/2013

III. PROJECT STRATEGY

A. Project Team/Partners

Key personnel funded by the project: Michele Walker-MN DNR NW Regional Groundwater Specialist; Becky Marty-MN DNR NW Regional Ecologist; DNR Water Monitoring Crew; DNR unclassified Staff, Contractor for vegetation evaluation & bryophyte collection (George-Ann Maxson); Contractor for bryophyte identification (Jan Janssens); Contractor for ditch abandonment, habitat restoration and wetland banking analysis (University of MN-NRRI).

Supporting Partners: Lake of the Woods County Environmental Director, US Army Corps of Engineers

B. Timeline Requirements

The monitoring sites will need to be installed and monitored for at least two (2) years, in order to evaluate existing hydrology in the peatland. Upon completion of the second year of monitoring, the data will be compiled into a report on current hydrology and habitat along with an evaluation of possible sites for ditch abandonment and road mitigation. The data can also be used to determine the best possible method for ditch abandonment if that is needed to improve habitat.

C. Long-Term Strategy and Future Funding Needs

If ditch abandonment is a viable method for habitat restoration; future work may involve design and implementation of ditch abandonment. Technical analysis and engineering would be completed to apply for wetland banking credits and mitigate the negative impacts of the road. Once the ditch abandonments and road mitigations are completed, long-term monitoring of the hydrologic effectiveness of this effort and the response of vegetation to changed habitat conditions will be conducted.

2011-2012 Detailed Project Budget: Proposal# 069-C1+2 - Restoration Strategies; Ditched Peatland Scientific and Natural Areas

IV. TOTAL TRUST FUND REQUEST BUDGET 2 years

BUDGET ITEM (See list of Eligible & Non-Eligible Costs, p. 13)	AMOUNT
Personnel: Hydrologist 3-processing of LiDAR data and determination of internal watershed boundaries. Done in year 1 of project	\$ 5,040
Personnel: Hydrologist 3-planning and installation of synoptic ground water wells. Done in year 1 of project	\$ 1,800
Personnel: Hydrologist 3-data compilation and report writing. Done in both years of project	\$ 12,600
Personnel: Hydrologist 3-project management. Done in both years of project.	\$ 3,600
Personnel: Hydrologist 3-Results analysis, research, and recommendations regarding ditch abandonment and habitat improvement. Done in year 2 of project	\$ 2,880
Personnel: Four (4) Hydrologist 1-Construct and install three (3) automated surface water, ground water and precipitation gaging sites. Includes ditch cross section elevation measurement at gaging site. Done in year 1 of project	\$ 11,760
Personnel: Two (2) Hydrologist 1-Maintain three (3) automated surface water, ground water and precipitation gaging sites and take 8 synoptic surface water velocity measurements with ditch cross section elevations. Done over both years of project	\$ 33,600
Subtotal - Personnel	\$ 71,280
Contracts: Vegetation Data Collection and Compilation. One contractor will collect vegetative data. Vegetative collection will include moss and separate contractor will identify and compile moss data.	\$ 12,200
NRRI contract: Review and analysis of data to determine potential restoration methods including ditch blocking and vegetation establishment/management. Conduct preliminary analysis to determine the potential for wetland mitigation credits.	\$ 29,180
Subtotal - Contracts	\$ 41,380
Equipment/Tools/Supplies: Design Analysis Water Log Series Equipment (includes data collection platform, antenna, cables, lightening protection, 7 pressure transducers with cable and a Mounting Panel). Three Stations for automatically collecting ground water and surface water data @ \$15055 each.	\$ 45,165
Equipment/Tools/Supplies: Sontek Uplooker Acoustic Velocity Meters. Three meters, one for each station, to measure ditch flow @ \$8000 each.	\$ 24,000
Equipment/Tools/Supplies: 20 Watt Solar Panel and Regulator. Three solar power stations, one for each automatic data collection station, to provide power @ \$330 each.	\$ 990
Equipment/Tools/Supplies: Marine Battery. Three battery power supply, one for each automatic data collection station @ \$110 each	\$ 330
Equipment/Tools/Supplies: Hoffman Steel Enclosure. Protection for automatic data collection equipment at each of three stations. \$1900 each	\$ 5,700
Equipment/Tools/Supplies: Texas Electronic Rain Gage. Three gages, one at each station. Measures precipitation for ground water recharge measurements and surface water discharge measurements. \$220 each	\$ 660
Equipment/Tools/Supplies: Glvanized pipe, conduit, wire and cement to install automated gaging stations. \$750 each	\$ 2,250
Equipment/Tools/Supplies: Schedule 40 PVC Riser pipe with 6 inch stainless steel 10-slot well points for 40 synoptic wells in each of 10 vegetation plots @ \$95/well	\$ 3,800
Subtotal - Equipment	\$ 82,895

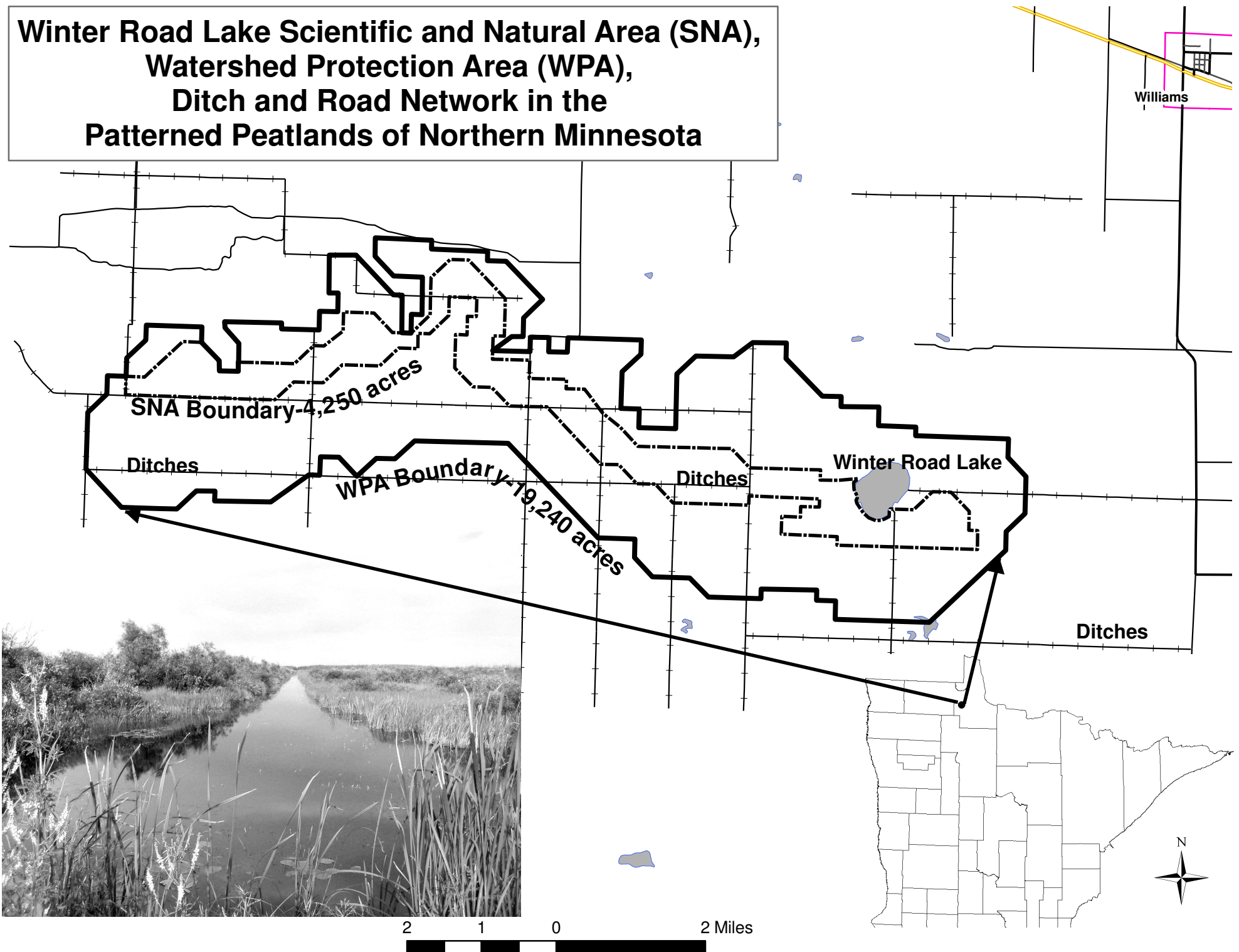
2011-2012 Detailed Project Budget: Proposal# 069-C1+2 - Restoration Strategies; Ditched Peatland Scientific and Natural Areas

Acquisition (Fee Title or Permanent Easements): NA	NA
Travel: Hydrologist 3 & Natural Resources Senior round trip Bemidji to SNA, mileage, lodging, meals	\$ 647
Travel: Four (4) Hydrologist 1 round trip St. Paul to SNA, mileage, lodging, meals for automated stream/observation well equipment installation	\$ 1,118
Travel: Hydrologist 1 round trip St. Paul to SNA, mileage, lodging, meals for 8 Synoptic surface water measurements, 40 ground water measurements & maintenance of 3 automated stations	\$ 2,680
Subtotal - travel	\$ 4,445
TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND \$ REQUEST	\$ 200,000

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ Being Applied to Project During Project Period:	\$ -	
Other State \$ Being Applied to Project During Project Period:		Accounting expenses not being reimbursed
	\$ 4,033	
In-kind Services During Project Period: DNR Expenses for monitoring hydrologist 1 hired to backfill classified positions.	\$ 8,000	confirmed
In-Kind Personnel: Natural Resource Senior-data compilation and report writing. Done in both years of project.	\$ 7,200	time not being reimbursed
In-Kind Personnel: Natural Resource Senior-Results analysis, research, and recommendations regarding ditch abandonment and habitat improvement. Done in both years of project	\$ 3,600	time not being reimbursed
In-Kind Personnel: Staff time replacement costs for four (4) hydrologist 1, one (1) hydrologist 3	\$ 71,280	
Remaining \$ from Current ENRTF Appropriation (if applicable):	\$ -	
Funding History:	\$ -	

Winter Road Lake Scientific and Natural Area (SNA), Watershed Protection Area (WPA), Ditch and Road Network in the Patterned Peatlands of Northern Minnesota



Organization Description

The Minnesota Department of Natural Resources (DNR)'s mission is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. The Department consists of several divisions based on the state's natural resources, such as Fish and Wildlife, Forestry, Lands and Minerals, Parks and Trails, and Ecological Resources and Waters, as well as four regions and four support bureaus.

Project Manager Qualifications

Michele Walker

Michele Walker is a hydrogeologist (Geoscientist license #30096) in the Groundwater Unit with Minnesota DNR Division of Waters. Her program responsibilities are to provide technical analyses of the nature, distribution, appropriation and sustainability of groundwater in the northwestern counties, which include Minnesota's portion of the Red River Valley and extensive peatlands. Michele has an MS degree in Soil Science from the University of Idaho and a BS degree in Geology from Bemidji State University. She has worked for both the Minnesota DNR and Minnesota Department of Agriculture as a hydrogeologist since 1991 and has published several peer-reviewed papers in scientific journals including the Journal of Environmental Quality and Environmental Science and Technology.

As a hydrogeologist with the State, she has worked on both groundwater quantity and groundwater quality issues. Her current position involves working on groundwater quantity concerns as they relate to water supply in the northwestern region of the State. She evaluates water supply plans for many cities in northwestern Minnesota and evaluates surface water and groundwater interaction as it relates to ground water appropriation.

In previous positions with the State, she has performed hydrologic work to protect ground- and surface water from agricultural contamination. This has included reviewing and evaluating environmental investigations and remediation at agricultural chemical cleanup sites; coordinating the work of consultants, responsible parties and other interested people; and working on innovative cleanup approaches to agricultural contamination.

