Environment and Natural Resources Trust Fund
2009 Phase 2 Request for Proposals (RFP)

LCCMR ID: 099-D1

Project Title: Wind and Wildlife: Preventing Problems and Reaching Solutions

Total Project Budget: $ $199,719

Proposed Project Time Period for the Funding Requested: 2 yrs (July 2009 to June 2011)

Other Non-State Funds: $ $0.00

Priority: D1. Renewable Energy Life Cycle Costs and Impacts

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Sponsoring Organization: U of M, NRRI

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Region:	County Name:	City / Township:
NE	Aitkin, Carlton, Cook, Itasca, Koochiching, Lake,	

Summary: Wind power is an emerging issue in northeastern MN. Our project will enable turbine siting that provides renewable energy for homes and industry and reduces impacts on the tourism industry.

Main Proposal: 1008-2-009-proposal-Moen_Proposal_Wind_LCCMR_toSPA.doc

Project Budget: 1008-2-009-budget-Moen_Budget_Wind_LCCMR_toSPA.xls

Qualifications: 1008-2-009-qualifications-Moen_PMQ_Wind_LCCMR_toSPA.doc

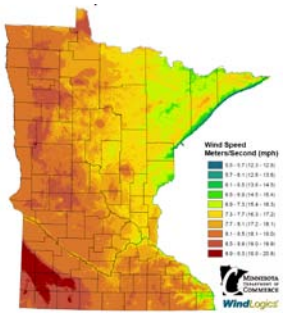
Map:

Letter of Resolution:

MAIN PROPOSAL

PROJECT TITLE: Wind and Wildlife: preventing problems and reaching solutions

I. PROJECT STATEMENT



This will be the first attempt to use existing and new data to characterize potential effects of wind power on birds and bats in northeastern Minnesota. Existing small-scale and commercial scale wind turbines indicate wind power can be successful in NE MN even though current wind speed maps indicate that NE MN has less wind than other parts of the state (see map to right).

Wind power development is an emerging issue in NE MN. Our project will enable turbine siting choices that reduce impacts on birds and bats while simultaneously providing a renewable energy source for homes, businesses, and industry that provides economic impact in NE MN, unlike when power is imported from other regions.

Minnesota Power has installed NE MN's first commercial-scale turbines at the Taconite Ridge Energy Center near Virginia (Allete 2005, 2007). A recent study has indicated strong potential for wind energy along the North Shore (Dr. Michael Mageau, pers. comm.). With increasing energy costs, tax incentives, and the 25% Renewable Portfolio Standard by 2025 initiative, Minnesota will see increasing development of renewable energy resources over the next decade.

Avoiding concentration areas of birds and bats would benefit both wildlife and enhance wind power development. Wind power sites are subject to regulations and a permitting process, and in the absence of data environmental and economic costs must be estimated. For example, the North Shore of Lake Superior is among the major flyways for raptors (about 100,000), songbirds (millions of birds), and an unknown number of bats. Birds are an important component of ecotourism, and birds and bats feed on forest insect pests. The tourism industry in NE MN would want to avoid negative impacts on birds when siting wind turbines.

With installation of larger facilities there is a chance for public comment, as well as comment provided by agencies such as the MN DNR and U.S. Fish & Wildlife Service. To date these comments have relied on general knowledge of protected areas and sites of known interest such as Hawk Ridge east of Duluth, rather than projects specifically tasked with identifying potential effects of wind power turbines on wildlife.

It is unrealistic to completely eliminate mortality from wind power sites, but it is realistic to identify preferred sites that would reduce threats to birds and bats. This project will facilitate a more comprehensive site selection process with recommendations for environmentally-sound development of the wind industry in the forested regions of MN by identifying areas of risk to migratory and breeding bats and birds. At present there are no means available to make these assessments.

II. DESCRIPTION OF PROJECT RESULTS

Result 1: Overview of bird and bat migration patterns in NE MN **Budget: $50,000**

Analyze existing data on bird movements in NE MN (NRRI National Forest Monitoring, North Shore Bird Migration Study, Doppler radar data) and use literature review to identify bat species that could be affected (no data exists other than occasional MN DNR County Biological Survey data).

Deliverable for Result 1	Completion Date
1. Report on bird and bat migration patterns in NE MN	6/30/2010
2. Maps of bird and bat migration patterns in NE MN	6/30/2010

Result 2: Movements of birds and bats at wind power sites in NE MN **Budget: $149,790**

Monitor passage of bird and bat species at existing and potential wind development sites following Kunz et al. (2007) protocols. Determine relative threats to birds and bats across spectrum of potential sites in NE MN. We will monitor bird and bat flight patterns near turbines that we have access to (e.g., Proctor School District wind turbine) to determine behavior and potential risk at turbines.

Deliverable for Result 2	Completion Date
1. Report on site-level movements of birds and bats	6/30/2011
2. Maps of site-level movements of birds and bats	6/30/2011

III. PROJECT STRATEGY AND TIMELINE

A. Project Partners

Dr. Gerald Niemi, Natural Resources Research Institute, University of Minnesota Duluth. Co-PI.

MN DNR will serve as Project Advisor with Bob Leibfried (Regional Manager, Division of Ecological Services, Grand Rapids) as contact person. We worked with Bob to develop this proposal.

Proctor School District, Jack Johnson, Facilities Manager. We have received permission to use the facility as a study site.

B. Project Impact

This is the first study in NE MN of effect of wind power development on bird and bat species. This information will be extremely useful to wind power developers, utility companies, and for facilitating environmental review on prospective sites. Furthermore, results of this study can help implement ecologically sound wind power facility decisions, will provide a biological basis to respond to site selection, and will provide data on public perception of wind power developments in NE MN.

C. Time

In 2009 we will begin the general overview (Deliverable 1) and prepare field equipment to collect data during the Fall 2009 migration. In 2010 we will collect data during both the spring and fall migrations throughout the NE region, and in 2011 we will monitor the spring migration. Time and funding estimates are based on other research projects that PI's Moen and Niemi have led.

D. Long-Term Strategy (if applicable)

Minnesota will see increasing development of renewable energy resources over the next decade. Data from this project will help the permitting and regulatory process. We will also be applying for funding from the IREE RFP in 2008, and other sources as applicable. In the long-term, investing in movement patterns of birds and bats may actually reduce costs associated with lawsuits based on inadequate information.

Project Budget

IV. TOTAL PROJECT REQUEST BUDGET

BUDGET ITEM	AMOUNT	% FTE
Personnel: R Moen, PI.	$ 58,817	33%
G Niemi, CO-PI		0%
Grad Research Assistant, TBN.	$ 38,917	50%
Grad Research Assistant, TBN, Summer.	$ 11,410	50%
Grad Researh Assistant, TBN, Summer.	$ 11,410	50%
Lab Technician, TBN.	$ 34,279	33%
Undergrad Research Assistant, TBN.	$ 8,246	22%
Travel: Monitor bird and bat passage at study sites. Meetings as needed.	$ 24,000	
Other: GIS Lab User Fee 200hr/yr/$4.10 hr, $1,640 over 2 years. Express mail $300. Long-distance phone $200.	$ 2,140	
Supplies: Field supplies $10,000 (3 sets of Night Vision equipment and Ultrasound microphones). Computer supplies $500: backup materials and data storage	$ 10,500	
	$ -	
TOTAL PROJECT BUDGET REQUEST TO LCCMR	$ 199,719	

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	

2009 LCCMR Project Manager Qualifications and Organization Description - Phase 2

Wind and wildlife: preventing problems and reaching solutions

Ronald A. Moen, Natural Resources Research Institute, University of Minnesota Duluth

Key Qualifications

Dr. Moen is a Research Associate at the Natural Resources Research Institute, non-tenure track Assistant Professor in the Biology Department at the University of Minnesota Duluth, and holds appointments in the graduate programs of Integrated Biological Science (Duluth campus) and Conservation Biology (Twin Cities campus).

Education

University of Minnesota, Wildlife Conservation, Ph.D. 1995
University of Minnesota, Wildlife, M.S. 1988
Cornell University, Biological Sciences, B.S. 1984

Selected Grants

2009. National Park Service. Steve Windels, Michael E. Nelson, and R.A. Moen. Investigate Effects of Climate Change and Other Factors on Population Viability of Moose in Voyageurs National Park. $307,700.

2008. National Park Service. R.A. Moen and S. Moore (Grand Portage Natural Resources and Grand Portage Indian Reservation). Beaver Populations in Grand Portage National Monument and the Grand Portage Indian Reservation $18,985.

2008. MN Department of Natural Resources. R.A. Moen. Pine Marten and prey in NE Minnesota. $20,000.

2008. National Council on Air and Stream Improvement. R.A. Moen and G.J. Niemi. Canada Lynx and Snowshoe Hare Habitat Use Interactions. $10,000.

2006. Tribal Landowners Incentive Program, USFWS. R.A. Moen, G. Host, G.J. Niemi, and B. Whiting (Grand Portage Indian Reservation). Identification of suitable habitat for Canada lynx -- Bizhiw -- in the Grand Portage area and northeastern Minnesota within 1854 Ceded Territories. $141,000.

Selected Publications:

Moen, R.A., C.L. Burdett, and G.J. Niemi. 2008. Predicting suitable denning habitat for Canada lynx based on past reproduction. *In press, Journal of Wildlife Management*.

Moen, R. G.J. Niemi, and C. Burdett. 2008. Canada lynx in the Great Lakes region. Final report to USDA Forest Service and US Geological Survey and Minnesota Department of Natural Resources. NRRI Technical Report No. NRRI/TR-2008-14.

McCann, N.P., R.A. Moen, and G.J. Niemi. 2008. Using pellet counts to estimate snowshoe hare numbers in Minnesota. Journal of Wildlife Management 72:955-958.

Burdett, C.L., R.A. Moen, G.J. Niemi, and L.D. Mech. 2007. Defining Canada lynx space use and movements with GPS telemetry. Journal of Mammalogy 88:457-467.

Moen, R. G.J. Niemi, J. Palakovich, and C. Burdett. 2006. Snowtrack surveys for Canada lynx presence in Minnesota west of Highway 53. NRRI Technical Report No. NRRI/TR-2006-17.

Natural Resources Research Institute is a part of the University of Minnesota Duluth. NRRI's mission is to promote private sector employment based on natural resources in an environmentally sensitive manner. NRRI scientists have extensive experience in applied ecological research on terrestrial and aquatic systems.

MAP

Potential wind speeds mapped for northeastern Minnesota (WindLogics 2007) which is one of factors used to site wind power facilities. Potential for industrial scale wind power is higher in western Minnesota, but the Minnesota Power site near Hibbing ( ) indicates that wind power development will occur in the Northeast Region too.

The best bird migration data is available for the Hawk Ridge Observatory ( )and additional data is being collected in an ongoing bird migration study ( ). We identify potential study sites ( )that do not have existing wind power facilities for this project based on estimated wind speeds and expect actual study sites to be located based on ownership, wind power plans, and consultation with regulatory agencies.