

**Environment and Natural Resources Trust Fund
2010 Request for Proposals (RFP)**

LCCMR ID: 150-E2

Project Title:

Conservation Planning Along Lake Superior's North Shore

LCCMR 2010 Funding Priority:

E. Natural Resource Conservation Planning and Implementation

Total Project Budget: \$ \$203,941

Proposed Project Time Period for the Funding Requested: 2 years, 2010 - 2012

Other Non-State Funds: \$ \$0

Summary:

We will synthesize data to illustrate planning scenarios for Lake Superior's North Shore into a land conservation plan to protect its wildlife, plants, water quality, recreation, and aesthetics.

Name: Gerald Niemi

Sponsoring Organization: UMD, NRRI

Address: 5013 Miller Trunk Hwy
Duluth MN 55811

Telephone Number: (218) 720-4270

Email: gniemi@d.umn.edu

Fax: (218) 720-4328

Web Address: http://www.nrri.umn.edu/cwe/default.htm

Location:

Region: NE

County Name: St. Louis

City / Township: Duluth

| | | |
|----------------------|------------------|------------------|
| _____ Knowledge Base | _____ Broad App. | _____ Innovation |
| _____ Leverage | _____ Outcomes | |
| _____ Partnerships | _____ Urgency | _____ TOTAL |

Project Title: Conservation Planning Along Lake Superior's North Shore

Project Statement

The North Shore of Lake Superior is one of the most scenic areas and the top natural resource-based tourist destination in Minnesota. A unique shoreline, boreal-hardwood forests, state parks, trails, and outstanding vistas overlooking the panorama of Lake Superior draw tourists. It also has one of the greatest natural biological phenomena in Minnesota. Each year over 94,000 raptors (hawks, eagles, falcons, osprey, and vultures) migrate along the North Shore and are counted, making this region one of the top three raptor migrations in the United States. Recently, the area has undergone expanding residential and commercial development, increased visitation and traffic congestion, and wind turbine energy development is likely in the near future. The 9 state parks, 5 wayside rests, and Grand Portage National Monument along the North Shore give the impression the area is well protected for conservation, but only 6% of the North Shore coastal area has protected status (see graphic). There is an urgent need for a concerted conservation planning effort along the North Shore of Lake Superior while much of the area is still intact. As the climate warms and more people seek cooler climates, it is expected that development will increase in this region.

The goal of this project is to synthesize existing and newly derived data on the natural resources of the North Shore region into a comprehensive land conservation plan from the St. Louis River estuary through Duluth and up to the Canadian border. A key objective is to determine how much area needs to be conserved to adequately protect the integrity, wildlife, water quality, and aesthetics of the region, and identify particular landscapes critical for conservation. Plans that have already been developed for the area are fragmented and limited in scope. Moreover, these plans do not adequately address the major threats to the natural resources of the North Shore region: residential and commercial development and the growing interest in wind turbines. The latter threat was recently introduced after testing indicated adequate wind velocities in several places along the shore.

The partners in this project, the U of MN-Natural Resources Research Institute (NRRI), the Nature Conservancy (TNC), and the Minnesota Department of Natural Resources (MNDNR) have substantial geographic information system (GIS) data for the region and cooperated in the development of the Statewide Conservation and Preservation Plan. We will augment this with new data needed to assess conservation priorities. We lack data on the distribution of many wildlife species (see Result 2 below) along the shoreline and inland. Hence, we cannot address the extent to which land conservation efforts should be directed toward the nearshore area or the larger contiguous blocks of forest away from the shoreline. These same data will be useful to address what wildlife species are using different portions of the region and the cover types they prefer. Our goals include the integration of information on the major threats, but more specifically our efforts would consider emerging issues such as land use change potential, land fragmentation and parcelization, and water quality issues such as sewage treatment and storm water run-off into Lake Superior.

Description of Project Results

Result 1. Integration of new data.

Budget: \$17,393.

We have substantial data from the CoastalGIS website and a natural resource (NR) data portal that will be developed by the time this project begins. These data include land use, land cover, transportation networks, topography, soils, land ownership, and wildlife and fisheries information. We will incorporate new data such as LIDAR and planning data from communities into the GIS data portal.

Deliverable: Compilation of GIS data into NRDP for the North Shore study region December 31, 2010

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Result 2. Surveys for key species of conservation concern.

Budget \$118,891.

There is a need for additional wildlife surveys to assess species use of the nearshore and inland away from the shoreline. Surveys are needed for species of conservation concern (all bat species, peregrine falcon, bald eagle, golden eagle, olive-sided flycatcher, black-throated blue warbler, and rusty blackbird). These data will be essential to identify where species of conservation concern occur in the region. We anticipate obtaining suitable information on species groups such as rare plants from the Minnesota County Biological Surveys conducted in the area. Data on game species and fish are collected by the MN DNR.

Deliverable: 1) Data gathering for wildlife, plant, and fisheries information June 30, 2011
2) Data compilation and integration into the NR data portal. December 31, 2011

Result 3. GIS modeling, data visualization, and citizen surveys.

Budget \$38,675.

We will identify high risk land parcels and create computer-generated landscape models and three-dimensional visualizations of the North Shore landscape under different scenarios of development. Surveys will be completed on the aesthetic reaction of local citizens and tourists to development scenarios.

Deliverable: 1) GIS-derived landscape models and visualizations December 31, 2011
2) Analysis of survey results of local citizens and tourists June 30, 2012

Result 4. Develop a conservation plan for the North Shore.

Budget \$28,982.

We will identify strategies for specific target conservation areas that can be used by state and local governments, non-profit conservation organizations, and others. Recommendations will be made for conservation priorities to ensure protection of wildlife, plants, fisheries, water quality, and recreational resources along the North Shore of Lake Superior.

Project Strategy

Project Team Partners: Gerald J. Niemi, Ronald Moen, and George Host, Natural Resources Research Institute, University of Minnesota Duluth – overall project management and coordination with partners. Meredith Cornett, The Nature Conservancy, will contribute on Results 1 and 4, plus cooperation on 2 and 3. Patrick T. Collins, Program Manager, Minnesota’s Lake Superior Coastal Program, MNDNR -- contributions on Results 1 and 4, plus cooperation on 2 and 3.

Timeline Requirements: We do not anticipate any specific timelines besides those we have outlined in the results. We expect to finish this project during the two-year time frame.

Long-Term Strategy: This information will be essential for municipalities, county commissioners, developers, the MNDNR, TNC, MN Land Trust, the Governor’s Council on Minnesota’s Coastal Program, the North Shore Management Board, and the Arrowhead Regional Development Commission. We will facilitate the incorporation of this information into the North Shore Management Plan and into NOAA’s Coastal and Estuarine Land Conservation Plan. This will thereby provide a rationale and access to state funds (e.g., MN dedicated funding, MN Land Trust) as well as NOAA’s federal coastal funding.

Project Budget

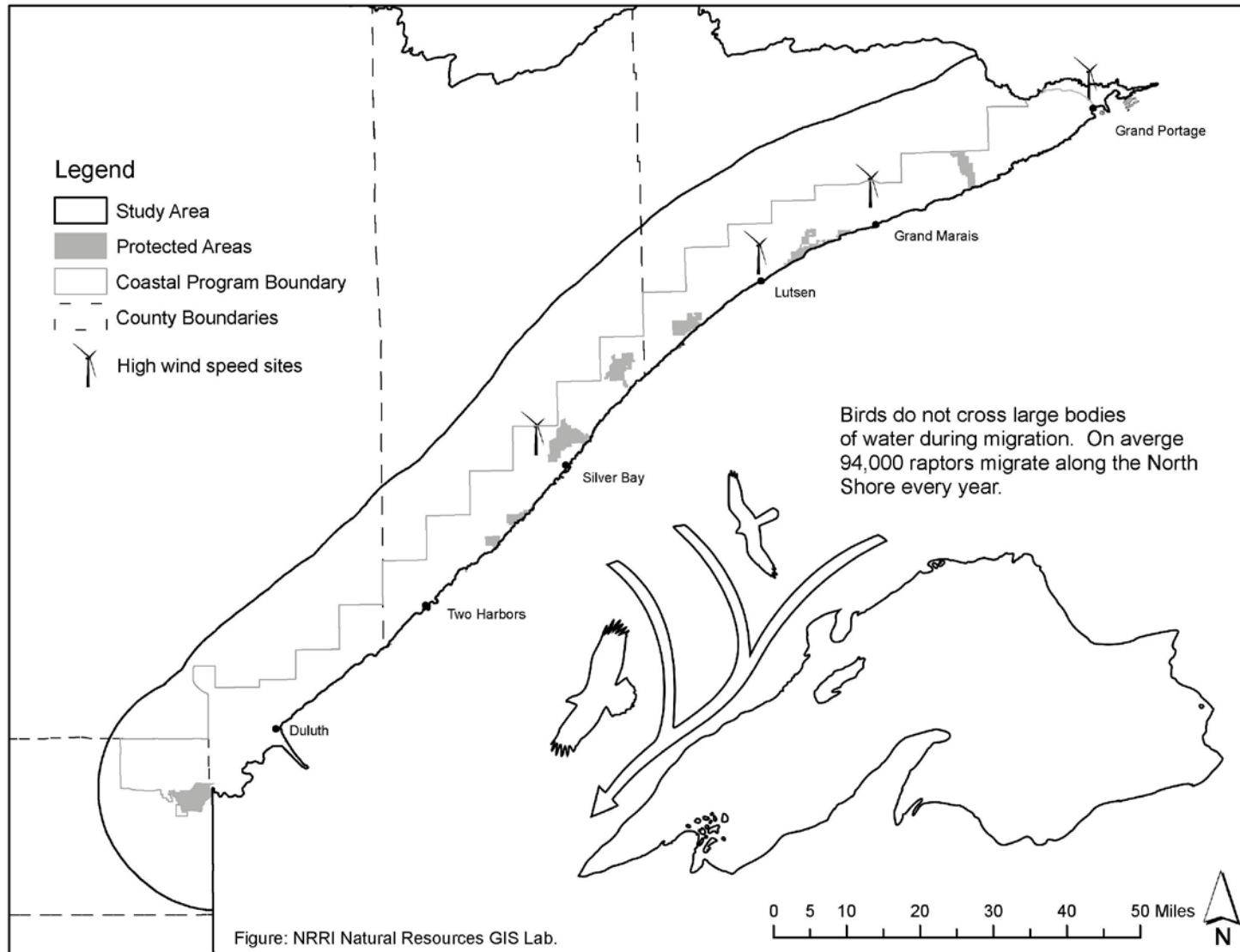
IV. TOTAL PROJECT REQUEST BUDGET (2 years)

| <u>BUDGET ITEM</u> | <u>AMOUNT</u> |
|--|-------------------|
| Personnel: | \$ - |
| George Host - Sr. Res. Assoc. (8%@ 2 yrs mos; fringe = 32.3%) All results | \$ 21,370 |
| Ron Moen-Res. Assoc. (10 % @ 2 yrs; fringe rate = 32.3%) All results | \$ 18,625 |
| 1 GIS specialist (20 % @ 1 yr; fringe rate = 32.3%) - Result 1 | \$ 15,893 |
| Terry Brown - Res. Assoc. (15%@1 yr; in year 2; fringe rate = 32.3%) - Result 3 & 4. | \$ 12,538 |
| 1 Grad. Res. Asst. (50% @1 yr; 25% @1 yr; fringe rate 16.84% AY 25% summer) All results. | \$ 43,359 |
| 2 Temporary Research Assistants (50% @ 12 mos; fringe = 8.21 %) - Result 2 & 3. | \$ 48,371 |
| 2 Graduate Research Assts. (50%@3 mo effort, summer yr 1 and 2, fr. 25%) Result 2 & 3 | \$ 25,230 |
| Equipment/Tools/Supplies: | \$ - |
| Field supplies | \$ 1,800 |
| Waterproof paper/pens; batteries, flagging; replacement of gps units, binoculars, and automatic ultra-sound bat recorders | |
| Travel: | \$ - |
| Field travel for field work and to attend in-state meetings (4100 mi @\$0.55/mi; 50 nights lodging @ \$50/night; 90 d per diem @\$18/d x 6 individuals) | \$ 14,155 |
| | |
| Additional Budget Items: | \$ - |
| NRRI GIS lab user fee (\$4.10/hr for 634 hrs for 2 years) | \$ 2,600 |
| | |
| TOTAL PROJECT BUDGET REQUEST TO LCCMR | \$ 203,941 |

V. OTHER FUNDS

| <u>SOURCE OF FUNDS</u> | <u>AMOUNT</u> | <u>Status</u> |
|--|---------------|---------------|
| Other Non-State \$ Being Applied to Project During Project Period: | \$ - | NA |
| Other State \$ Being Applied to Project During Project Period: | \$ - | NA |
| In-kind Services During Project Period: | | Approved |
| G. Niemi - Professor (5% effort@ 2 yr; Fringe= 32.3%) | \$ 20,495 | |
| G. Host - Sr. Res. Assoc. (5%@24 mos; Fringe rate - 32.3%) | \$ 11,149 | Approved |
| Note - G. Host, R. Moen, and T. Brown must generate a substantial part of their salary from external funding; Niemi is employed 100% time | | |
| Remaining \$ from Current Trust Fund Appropriation (if applicable): | | NA |
| Funding History: Indicate funding secured prior to July 1, 2010 for activities directly relevant to this specific funding request. State specific source(s) of funds. | \$ - | |

Conservation Planning Along Lake Superior's North Shore



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5. Project Manager Qualifications; Gerald J. Niemi, Biology and Natural Resources Research Institute, UMD

Education

Florida State University, Biology, PhD, 1983; University of Helsinki, Fulbright Scholar, Pre-doctoral, 1981; UMD, Biology, Zoology, BS, 1974; MS 1977

Appointments

Professor: Biology, UMD, 1993 to present. *Senior Research Associate:* NRRI, UMD, 2008-present. *Director:* Center for Water and the Environment (CWE), NRRI, UMD, 1989-2008. *Department Chairman:* Biology, UMD, 1997-1998. *Graduate Faculty Appointments:* Integrated Biological Sciences UMD, 2007-present; Biology 1987 to 2009 (program terminated); Chemical Toxicology, UM-TC, 1992 to present; Conservation Biology Program, UM-TC, 1996 to present.

Publications > 100 peer reviewed

Niemi, G.J., J. Kelly. 2007. Environmental indicators for the Great Lakes coastal region. *J Journal of Great Lakes Research* 33 (special issue) 3 (Guest editors)

Brazner, J.C., N.P. Danz, G.J. Niemi, R.R. Regal, Trebitz, A.S., R.W. Howe, J.M. Hanowski, L.B. Johnson, J.J.H. Ciborowski, C.A. Johnston, E.D. Reavie, V.J. Brady, G.V. Sgro. 2007. Evaluation of geographic, geomorphic, and human influences on Great Lakes wetland indicators: a multi-assemblage approach. *Ecological Indicators* 7:610-635.

Wolter, P., G. Niemi, C. Johnston. 2006. Land use change in the U.S. Great Lakes basin 1992-2001. *Journal of Great Lakes Research* 32:607-628.

Niemi, G.J., M. McDonald. 2004. Application of ecological indicators. *Annual Review of Ecology and Systematics* 35: 89-111.

Research Projects - 46 managed, >\$18 million

2007-2008 Co-PI and Team Lead for Wildlife portion, Co-Lead for Land and Aquatic Habitat Conservation, Minnesota Statewide Conservation and Preservation Plan. LCCMR. \$450,000 to U of Minnesota-Institute on the Environment; 2001-2006 Lead PI with 27 Co-PIs. Development of environmental indicators of condition, integrity, and sustainability in the Great Lakes basin. U.S. EPA- NASA STAR Grant Program, \$6,979,667. 1991-2003 Lead PI. Effects of changes in the forest ecosystem on the biodiversity of Minnesota's northern forest birds. Minnesota LCMR. \$2,112,473 in cooperation with MN Department of Natural Resources.

Organization Description: Natural Resources Research Institute is a part of the University of Minnesota Duluth. Its mission is to promote private sector employment based on natural resources, in an environmentally sensitive manner. NRRI scientists have extensive experience in managing large, interdisciplinary projects whose objectives include the development of tools for environmental assessment and resource management. These tools promote citizen education leading to improved understanding of how human activities influence water quality and ecosystem health. Our scientists have been heavily involved in climate change work, in addition to participating as core team members of the MN Statewide Conservation and Protection Plan, where they were instrumental in developing the vulnerability index. Collaborators at the St. Anthony Falls Hydrologic Laboratory have extensive experience developing and implementing mechanistic models, including lake level, stream temperature, and lake water quality.