

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

LCCMR ID: 140-F1+2+5

Project Title: Climate Vulnerability Assessment for Minnesota Habitats and Species

Category: F1+2+5. Climate Change and Air Quality

Total Project Budget: \$ \$487,500

Proposed Project Time Period for the Funding Requested: 2 yrs, July 2011 - June 2013

Other Non-State Funds: \$ 200,000

Summary:

This project will conduct a comprehensive assessment of the effects of climate variability on Minnesota's plant communities and wildlife species. This assessment is a key step in climate adaptation planning.

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Sponsoring Organization: DNR

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Web Address _____

Location

Region: Statewide

Ecological Section: Statewide

County Name: Statewide

City / Township:

| | | | |
|--------------------------|-------------------------|-----------------------------|----------------------|
| _____ Funding Priorities | _____ Multiple Benefits | _____ Outcomes | _____ Knowledge Base |
| _____ Extent of Impact | _____ Innovation | _____ Scientific/Tech Basis | _____ Urgency |
| _____ Capacity Readiness | _____ Leverage | _____ Employment | _____ TOTAL _____% |

PROJECT TITLE: Climate Vulnerability Assessment for Minnesota Habitats and Species

I. PROJECT STATEMENT

The goal of this project is to conduct a comprehensive assessment of the effects of climate variability on plant communities and wildlife species in Minnesota. As continued pressure is placed on our natural resource base through invasive species spread, fragmentation, and increased product demand our natural resources become more and more vulnerable to environmental changes. These threats are amplified by the over arching impacts of climate change. Current trends indicate that we may already be observing impacts of climate variability and warming on key wildlife and forest species. For example changes in drought patterns and winter lows are indirectly impacting the species such as jack pine and red pine through alteration of the disturbance patterns these species depend. Since 1950, average ice-out has tended to get earlier by two days per decade and since 1996 the trend has escalated to 7.5 days per decade (data through 2006). Increasing temperatures and declining soil moisture during summer will have dramatic effects on plant communities (Carstensen et al. 2008).

Climate variability will alter most landscapes and watersheds in Minnesota therefore land managers must plan for changes in our natural systems in response to actual or expected climatic events or their effects. This type of planning is referred to as climate adaptation planning and can serve to moderate potential harm to our natural resources or exploits beneficial opportunities. Climate adaptation planning allows us to plan for managing the states resources through this transition allowing our natural systems to adapt to a certain amount of climate change. In spite of the recognition of this need, this type of adaptation planning for biodiversity has received little attention despite the high likelihood of ecosystem changes (Galatowitsch et al 2008).

Because of the urgency of this work we will begin aspects of the vulnerability assessment 2010 initially using Federal funding. However these funds can only be spent on a narrow set of species and we propose to use LCCMR funding to complete the majority of the assessment. The vulnerability assessment is a key initial step in the state's overall climate adaptation planning. The work developed in 2010 will allow the DNR to begin implementing the adaptation planning process as outlined in the "Building Species and Habitat Resilience to Climate Change" proposal (figure). We are also partnering with other researchers across the state to pull in the information garnered from the ongoing and current assessments to aid in coordination and avoid repetition. The final stages of this project will be to compile the information collected from this and other projects and data related to climate and climate change into a one stop web based portal for climate information available to other land managers and scientists.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: *Develop integrated vulnerability assessment for plant communities, and plant and wildlife species*

Budget: \$ 187,500

Sensitivity of plant communities and individual species will be determined based on existing regional downscaled climate models and characteristics such as hydrological sensitivities and effects of invasive species for plant communities; physiology, specific habitat requirements, and dispersal ability for species. An expert panel will be convened to help develop and review results and identify habitats and species most sensitive to climate variability. Databases will be created that include assessments of climate variability sensitivities for plant communities, plant species, and wildlife species. An analysis of potential climate adaptation and mitigation strategies based on results of the vulnerability analysis will be assessed.

| Outcome | Completion Date |
|---|------------------------|
| <i>1. Summarize and describe climate variability sensitivities for habitats and species including methodology, assumptions, and uncertainties</i> | <i>June 2012</i> |
| <i>2. Summarize and describe potential impacts for habitats and species including methodologies, assumptions, and uncertainties; identify habitats and species at greatest risk</i> | <i>December 2012</i> |

| | |
|--|-----------|
| 3. Summarize climate adaptation and mitigation strategies. | June 2013 |
|--|-----------|

Activity 2: Create and distribute information, key findings, and tools into deliverable products.

Budget: \$ 120,000

Vulnerability assessment information, products, and tools will be made available in a variety of formats including plant community and species factsheets, a vulnerability summary report, land management tools to help guide on the ground management decisions and all of this will be made available on the DNR website for access by natural lands and population managers, land use planners, and stakeholders.

| Outcome | Completion Date |
|---|-----------------|
| 1. Summary of information needs for resource managers and land use planners regarding climate variability adaptation strategies | December 2011 |
| 2. Customize products and tools for access on DNR website for resource managers and planners; evaluate project process and products | June 2013 |

Activity 3: Create the 'Minnesota Resource Data (Virtual) Portal'

Budget: \$ 180,000

Design and implement a 'web-based' facility that will make it easy for holders of miscellaneous resource data sets to provide searchable information about their data, the data itself, or an online reference. Users would be able to 'browse' or search that information about those data sets to find further information about and/or actually acquire data appropriate to their needs. Design and prototype methods to 'integrate' some data types contributed to the 'Minnesota Data Resource' creating a single statewide climate data base.

| Outcome | Completion Date |
|--|-----------------|
| 1. Web page or portal development for receiving data | December 2012 |
| 2. A web page for holders ('owners') to describe non-public data and reference | December 2012 |
| 3. For 'contributed' data sets an automated facility to import the data into an 'all resources' database. | June 2013 |
| 4. Create prototype 'retrieval standardization' application that retrieves data products from a 'non-participating' web-page-based provider of data and converts the results into to-be-determined standard formats. | June 2013 |

III. PROJECT STRATEGY

A. Project Team/Partners

This project proposal is supported by both Divisions of Ecological Resources and Fish and Wildlife. An interdisciplinary team carrying out this project will include: (1) DNR Division of Ecological Resources project manager responsible for project coordination, (2) contractors with experts in ecological sensitivity assessments and state of the art climate and ecological modeling. Contact has been made with Sue Galatowitsch and Peter Reich, University of Minnesota, to prepare this proposal and it is anticipated that their involvement will be solicited upon approval of this project. (3) DNR managers with expertise in ecological systems, fish and wildlife management, and geographic information systems to review methodologies and results. Primary proposal contacts: (1) Ann Pierce, Ph.D.; DNR Division of Ecological Resources, Conservation Management and Rare Resource Unit; Ann.Pierce@state.mn.us ; 651-259-5119

B. Timeline Requirements

The timeline for this project is estimated to be 24 months. In order to complete the project in a timely fashion, work for all 3 objectives will be scheduled in an overlapping manner.

C. Long-Term Strategy and Future Funding Needs

In the long-term, DNR managers anticipate the need to conduct additional vulnerability assessments for climate variability impacts on key systems such as watersheds, wetlands, lakes, rivers, streams, subsurface aquifers and critical ecological services such as watershed functions, pollination and pest control, soil generation and fertility, and natural resource based recreation. This vulnerability assessment proposal focuses on biodiversity and habitats as a high priority target area with results that will directly benefit those managing and conserving Minnesota's natural habitats and populations.

2011-2012 Detailed Project Budget

IV. TOTAL PROJECT REQUEST BUDGET (2 years)

| BUDGET ITEM <i>(See list of Eligible & Non-Eligible Costs, p. 13)</i> | AMOUNT |
|--|-------------------|
| Personnel: | \$ - |
| .6 fte Project Coordinator: 2 years; 80% salary; 20% benefits | \$ 130,000 |
| .2 fte Research Scientist 3: 2 years; 80% salary; 20% benefits | \$ 40,000 |
| .4 fte Ecologist: 2 years; 80% salary; 20% benefits | \$ 80,000 |
| Contracts: | \$ - |
| Activity 3: Service level agreement with DNR Management Information Services | \$ 149,000 |
| Equipment/Tools/Supplies: | \$ - |
| Acquisition (Fee Title or Permanent Easements): <i>In this column, indicate the proposed # of acres and who will hold title (e.g. DNR, Non-profit).</i> | NA |
| Travel: | \$ - |
| In-state travel: technical expert meetings | \$ 6,500 |
| Additional Budget Items: | \$ - |
| Expert panel meetings 10 per year (printing and technical services) | \$ 32,000 |
| Website and 4-6 workshops development (technical services and printing) | \$ 50,000 |
| TOTAL PROJECT BUDGET REQUEST TO LCCMR | \$ 487,500 |

V. OTHER FUNDS

| SOURCE OF FUNDS | AMOUNT | Status |
|--|---------------|------------------------------|
| Other Non-State \$ Being Applied to Project During Project Period: | NA | |
| Federal money for State wildlife grants | \$ 200,000 | <i>secure</i> |
| Other State \$ Being Applied to Project During Project Period: | NA | |
| In-kind Services During Project Period: | \$ - | |
| DNR Shared Services | \$ 17,556 | as per biennial budget |
| 1200 hours (i.e. DNR and nonprofit staff) technical guidance over 2 years | \$ 30,000 | |
| Remaining \$ from Current Trust Fund Appropriation (if applicable): | | |
| Funding History: | NA | |

Figure 1. DNR’s climate change response framework for integrating assessment, planning, management, and monitoring.

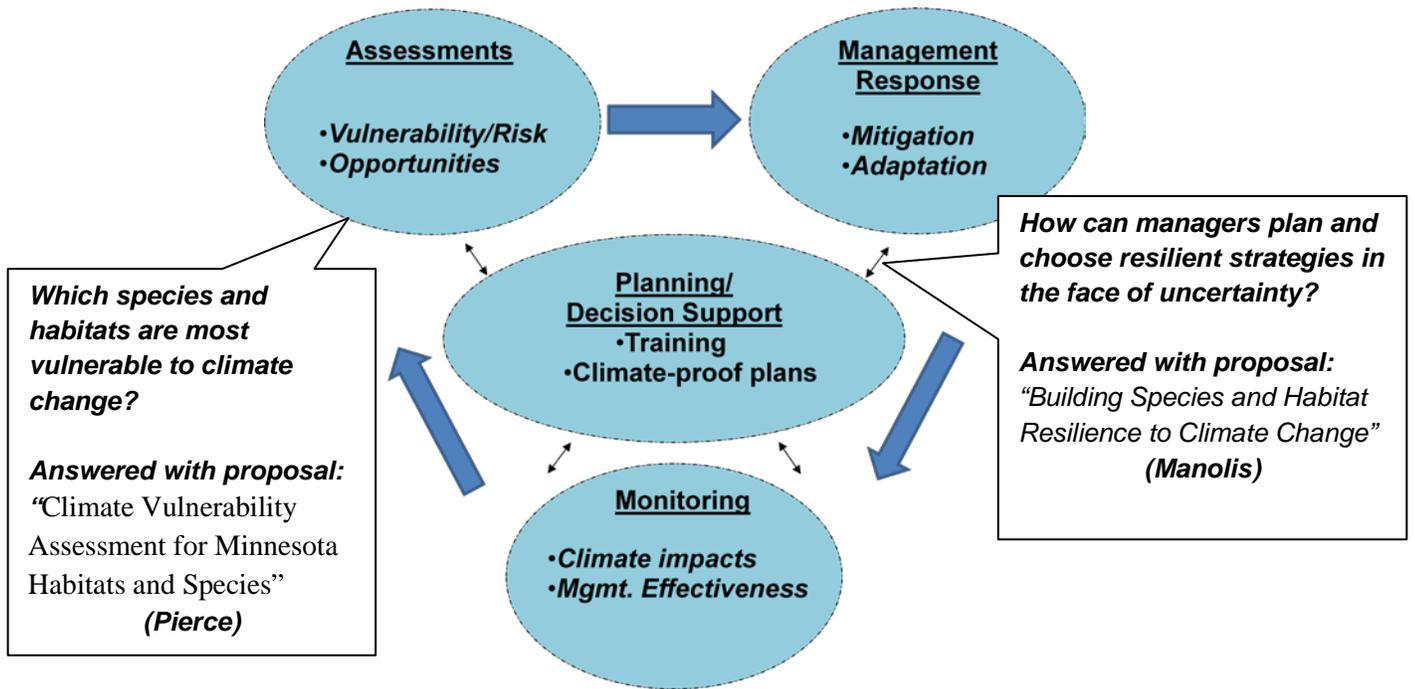
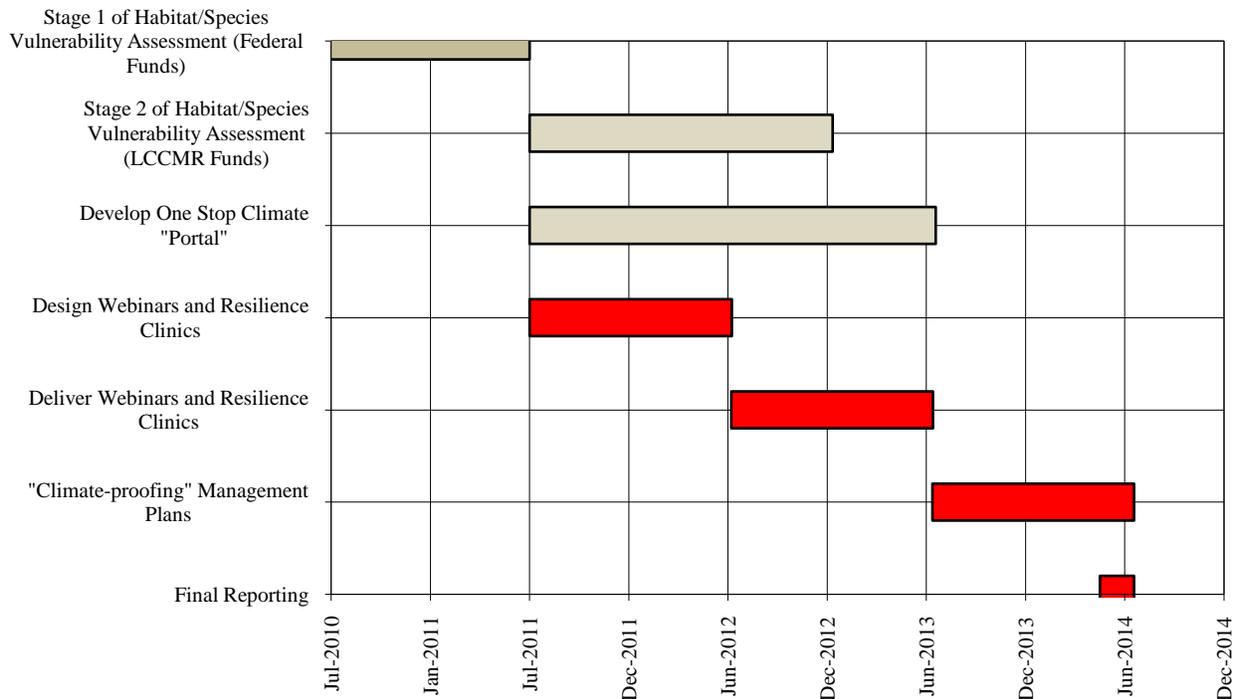


Figure 2. Timeline showing elements two DNR proposals: "Climate Vulnerability Assessment for Minnesota Habitats and Species" (light bars) and "Building Species and Habitat Resilience to Climate Change" (dark bars).



Ann Pierce, Ph.D., Supervisor Conservation Management and Rare Resources Unit:

Ann has a Ph.D. from the University of Minnesota in Conservation Biology (Ecosystem Ecology emphasis) and a Masters of Science from the University of Wisconsin in Natural Resources (Forest Ecology emphasis). She has worked for the DNR for fifteen years. Ann began her career in SE Minnesota as the Blufflands Coordinator working with local units of government to maintain and enhance the natural resources of the area. She continued this work focused on areas of high biodiversity significance in the blufflands landscape as Regional Plant Ecologist. Ann is currently heading the Conservation Management and Rare Resources Unit in the Ecological Resources Division of the DNR. In this role Ann directs the development of plans, strategies, policies, and procedures that effectively and consistently provide statewide direction for implementing programs. She also provides technical assistance and represents the conservation management unit's interest within the division of Ecological Resources and other departmental divisions to help guide resource conservation efforts. Ann also coordinates the unit's work activities with external partners and promotes partnership opportunities in order to achieve conservation objectives through integrated, coordinated, and cooperative ventures.

The Department of Natural Resources overall 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.