

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

LCCMR ID: 120-E

Project Title: Risk Assessment for Proactive Response to Forest Pests

Category: E. Aquatic and Terrestrial Invasive Species

Total Project Budget: \$ 566,340

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

Other Non-State Funds: \$ 0

Summary:

Pest risk assessment will proactively prioritize invasive species threats to Minnesota forests. An early detection network will be created to survey for high risk pests threatening to invade Minnesota.

Name: Robert Koch

Sponsoring Organization: Department of Agriculture

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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 _____%

2011-2012 MAIN PROPOSAL

PROJECT TITLE: Risk Assessment for Proactive Response to Forest Pests

I. PROJECT STATEMENT

Pest risk assessments provide a means for proactively prioritizing invasive species threats by identifying pests with the greatest likelihood of invading the state and causing adverse effects. This project will result in a scientifically based and transparent procedure for evaluating pest risk, a ranked list of the pests threatening to invade the state, and an early detection network focused on areas where new invasive forest pests are most likely to enter the state.

Invasive species are among the top threats to Minnesota's forests. Many serious invasive species are not yet in the state but may be spreading from nearby states or may be introduced from other countries (e.g., Asian longhorned beetle, 1000 cankers disease, Siberian moth, and many others). Our state's management response to new invaders has tended to be more reactive than proactive. Proactive management, which has proven to be more cost effective, strives to prevent the introduction of new pests and to detect and eradicate the new invaders before they become widespread. Agencies and land managers responsible for dealing with new invasive species threats are working with limited budgets, and therefore must prioritize which invasive species they will focus on. Limited resources can then be focused on the most important pests, which will optimize invasive species prevention and early detection efforts. Currently, risk assessments exist for some forest pests, but these risk assessments have generally been conducted on a national scale and may not be relevant to state-level decision making. Furthermore, not enough pests have been evaluated in a consistent manner to allow for comparison among pests to determine where resources should be directed. The MN Forest Protection Plan of 2008 emphasized the need for more pest risk assessment to strengthen forest protection systems.

We propose a project in which we will:

- Develop a rapid pest risk assessment protocol to evaluate and rank the pests on the State's list of invasive species threats,
- Conduct pest risk assessments for new invasive pests threatening to harm Minnesota's natural resources, and
- Develop an early detection network of semi-permanent plots in public and private wooded areas with high chances for pest introduction. Wooded areas near urban centers will be targeted because scientific data suggests that most invasive insects arrive and establish in urban/community forests before spreading to traditional natural forests. Industries in these areas will be educated on invasive species.

ENRTF funding will accelerate the development of such risk assessment protocols, which goes beyond the normal work conducted by this state or most other states. Furthermore, collaboration with the project partners (listed below) will result in a more in depth and comprehensive end product than could be developed with existing agency resources.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: *Pest Risk Assessment to Rank Pests for Proactive Response* Budget: \$ 198,114

Previously, the Minnesota Invasive Species Advisory Council (MISAC) used the opinion of a panel of experts to list and rank the invasive pests threatening the state. This list of potential pest threats will be updated to include new invasive species threats that have recently risen to attention. Based on an intensive regional pest risk assessment protocol created by the USDA Forest Service in Minnesota, a "stream-lined" rapid risk assessment protocol will be developed. As the intensive pest risk assessment protocol requires about one month to complete the detailed documentation of data and decision making steps, it is infeasible for use in evaluating numerous pests. The new rapid risk assessment

protocol will provide an important new methodology for evaluating and ranking numerous pests in a scientifically based and transparent manner.

The updated State list of invasive pest threats will provide the basis, from which forest insect pests will be selected for further evaluation and ranking. These pests will be evaluated with the rapid risk assessment protocol to rank their risks of invading and causing harm to the State's forest resources. Of these, the 8 highest ranking pests will be further evaluated with the intensive risk assessment protocol developed by the USDA Forest Service.

Outcome	Completion Date
1. Update the State's list of potential invasive pest threats	<i>Dec. 31, 2011</i>
2. Finalize rapid risk assessment protocol	<i>Mar. 31, 2012</i>
3. Evaluate pests using rapid risk assessment protocol	<i>June 30, 2013</i>
4. Evaluate pests using intensive risk assessment protocol	<i>June 30, 2014</i>

Activity 2: Early Detection Network for Proactive Response to Forest Pests Budget: \$ 368,226

A network of semi-permanent survey plots will be established for forest pest first early detection efforts. The survey plots will be located at six population centers throughout the state (Twin Cities, Duluth, Rochester, St. Cloud, Mankato and Moorhead), which have higher risk for pest introduction due to increased commerce and shipments which can carry new pests to those areas. At each population center, blacklight and pheromone traps will be set at six wooded, semi-natural areas near high-risk introduction sites (e.g., ports, warehouses). Outreach materials on invasive pests will be created and distributed to pertinent industries in these areas.

Outcome	Completion Date
1. Establish relationships to gain access to public/private land for survey	<i>June 30, 2012</i>
2. Collect samples for early detection survey	<i>Oct. 31, 2013</i>
3. Process samples from early detection survey	<i>June 30, 2014</i>

III. PROJECT STRATEGY

A. Project Team/Partners

R.L. Koch	MDA	Co-Principal Investigator	ENRTF funding to support a taxonomist & 2 seasonal staff to collect & process samples. No ENRTF funding to Koch.
W.D. Hutchison	U of MN, Entomology	Co-Principal Investigator	ENRTF funding to support a researcher for risk assessment work. No ENRTF funding to Hutchison.
R.C. Venette	USDA Forest Service	Provide technical guidance	No ENRTF funding to Venette.
L. Skinner & S. Burks	DNR	Provide technical guidance	No ENRTF funding to Skinner or Burks.

B. Timeline Requirements

This proposal is being submitted for a 3-year project. In the first year, the State's list of invasive pest threats will be updated, the rapid risk assessment protocol finalized, and some pests evaluated. In the second year, the early detection network will be developed, pest surveys will be conducted and additional pests will be evaluated. In the third year, pest surveys and evaluation will continue.

C. Long-Term Strategy and Future Funding Needs

Pest risk assessment protocols developed in this project will continue to be used to optimize allocation of limited resources to the pests of greatest concern, and therefore facilitate better long-term protection of the environment. The forest pest early detection network will dovetail with the Cooperative Agricultural Pest Survey (CAPS) conducted with USDA APHIS funding. These CAPS funds and other federal funding will be sought to continue the early detection efforts into the future.

2011-2012 Detailed Project Budget

IV. TOTAL TRUST FUND REQUEST BUDGET

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
Personnel:	
Insect taxonomist [unclassified] at MDA (1 yr salary+45% fringe)=\$66,770 x 2 yrs	\$ 133,400
Seasonal staff at MDA (6 mo salary+7.65% fringe)=\$13,394 x 2 staff x 2 yrs	\$ 53,574
Contracts:	
U of MN Post-Doctoral Researcher to be advised by W.D. Hutchison (1 yr salary+32.5% fringe)=\$63,995 x 3 yrs	\$ 191,985
Equipment/Tools/Supplies:	
Software for risk analyses: CLIMEX software for habitat suitability modeling \$2,285; SigmaPlot 11.0 (Graphing software) \$449; @Risk 5.0 (Industrial version for Monte Carol uncertainty analysis) \$1,995; Annual site license for SAS (statistical analysis system) \$150/year * 2 yrs = \$300; ArcView (GIS software) \$200/year * 3 years = \$600	\$ 5,629
Pest survey supplies: Blacklight traps & installation (36 sites x \$1,940 per trap cost x \$1,940 per trap instalation cost = \$139,680); Pheromone traps & lures (\$9,720); Hand held GPS unit (\$500); miscellaneous field supplies (\$1,000)	\$ 150,900
	\$ -
Acquisition (Fee Title or Permanent Easements): N/A	\$ -
Travel:	
[Rental for 2 cars + fuel costs] x 2 yrs for field staff to check traps throughout state	\$ 29,008
Meals while traveling x 2 yrs	\$ 1,344
Additional Budget Items:	
Publication & printing includes journal articles and outreach materials (e.g., fact sheets & posters)	\$ 500
TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND \$ REQUEST	\$ 566,340

V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
In-kind Services During Project Period: Koch and Hutchison will provide technical guidance & administration at no cost to ENRTF. Venette, Skinner and Burks will be providing technical guidance at no cost to ENRTF.	\$ -	
Funding History: From 2006 to 2008 MDA and the Forest Service began developing risk assessment procedures. However, this work has sat idle since due to lack of funding.	\$ -	

Project Manager Qualifications and Organization Description

PROJECT MANAGER QUALIFICATIONS: Robert L. Koch, Ph.D.

Education

- Ph.D. Entomology, University of Minnesota, Twin Cities, March 2005 (GPA 4.0/4.0)
- B.A. Biology, Saint John's University, Collegeville, MN, December 1999 (GPA 3.6/4.0)

Current Position

Research Scientist II, Plant Protection Division, Minnesota Department of Agriculture, 2008-present

- Coordinate surveys for invasive pests of natural and agricultural systems.
- Provide training and resources to communities to prepare for emerald ash borer.

Previous Professional Experience

- Project Consultant, Plant Protection Division, Minnesota Department of Agriculture, 2007-2008
- Plant Health Specialist II, Plant Protection Division, Minnesota Department of Agriculture, 2006-2007
- Post-Doctoral Research Associate, Department of Entomology, University of Minnesota, 2005-2006
- Graduate Research Assistant, Department of Entomology, University of Minnesota, 2000-2005

Selected Publications Related to Invasive Species and Risk Assessment (5 of 29 total)

Venette, R.C. and R.L. Koch. IPM for invasive species. 2009. In: Radcliffe, E.B., W.D. Hutchison and R.E. Cancelado (eds.), Integrated Pest Management. Cambridge University Press (in press).

Koch, R.L. and T.L. Galvan. 2008. Bad side of a good beetle: The North American experience with *Harmonia axyridis*. *BioControl* 53(1): 23-35.

Koch, R.L., R.C. Venette and W.D. Hutchison. 2006. Invasions by *Harmonia axyridis* (Pallas) (Coleoptera: Coccinellidae) in the Western Hemisphere: Implications for South America. *Neotropical Entomology* 35(4):421-434.

Koch, R.L., R.C. Venette and W.D. Hutchison. 2006. Predicted impact of an invasive generalist predator on monarch butterfly (Lepidoptera: Nymphalidae) populations: A quantitative risk assessment. *Biological Invasions* 8(5):1179-1193.

Koch, R.L. 2003. The multicolored Asian lady beetle, *Harmonia axyridis*: A review of its biology, uses in biological control, and non-target impacts. *Journal of Insect Science* 3(32): 16pp.
<http://www.insectscience.org/3.32/>

ORGANIZATION DESCRIPTION: Minnesota Department of Agriculture

The Minnesota Department of Agriculture has statutory authority to abate, suppress, eradicate, prevent, or otherwise regulate the introduction or establishment of plant pests that threaten Minnesota's agricultural, forest, or horticultural interests or the general ecological quality of the state (Minnesota Statutes Chapter 18G, 2007).

