

**Environment and Natural Resources Trust Fund
2016 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 121-D

Minnesota Invasive Terrestrial Plants and Pests Center - Phase 3

Category: D. Aquatic and Terrestrial Invasive Species

Total Project Budget: \$ 5,000,000

Proposed Project Time Period for the Funding Requested: 7 years, July 2016 to June 2023

Summary:

Funding is requested to accelerate priority research that will protect Minnesota's prairies, wetlands, forests, and agricultural resources from terrestrial invasive plants and pests, including non-native weeds, pathogens, and

Name: Dr. Robert Venette

Sponsoring Organization: U of MN

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Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

Changes in management options, costs, and research priorities during the spread of terrestrial invasive species

<input type="checkbox"/>	Funding Priorities	<input type="checkbox"/>	Multiple Benefits	<input type="checkbox"/>	Outcomes	<input type="checkbox"/>	Knowledge Base	
<input type="checkbox"/>	Extent of Impact	<input type="checkbox"/>	Innovation	<input type="checkbox"/>	Scientific/Tech Basis	<input type="checkbox"/>	Urgency	
<input type="checkbox"/>	Capacity Readiness	<input type="checkbox"/>	Leverage	<input type="checkbox"/>		TOTAL	<input type="checkbox"/>	%



Environment and Natural Resources Trust Fund (ENRTF)

2016 Main Proposal

Project Title: Minnesota Invasive Terrestrial Plants and Pests Center: Phase 3

PROJECT TITLE: Minnesota Invasive Terrestrial Plants and Pests Center: Phase 3

I. PROJECT STATEMENT

Funding is requested to accelerate priority research that will protect Minnesota’s prairies, wetlands, forests, and agricultural resources from terrestrial invasive plants and pests, including non-native weeds, pathogens, and insects. The Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) leads research that will provide new tools and techniques to:

- predict and prevent the arrival of new terrestrial invasive threats (e.g., pathway analyses for giant hogweed, soybean rust, and Asian longhorned beetle)
- detect and rapidly respond to new pest arrivals in the state (e.g., early detection tools for Dalmatian toadflax and brown marmorated stinkbug)
- mitigate impacts from well-established threats (e.g., improved integrated pest management for soybean aphid, buckthorn, and oak wilt);
- minimize impacts from measures to control invasive threats (e.g., protection of water quality and wildlife habitat);

This proposal funds the work of 8 graduate students and 8 post-docs and their faculty advisors. A new generation of scientists with this expertise is needed in Minnesota to address future invasive threats.

The MITPPC was established at the University of Minnesota under ML 2014, Chapter 312, Article 13, Section 44. The MITPPC is administratively located in the College of Food, Agricultural, and Natural Resources Sciences. Research and outreach activities of the Center are conducted in close collaboration with state, federal, local and tribal governments, nongovernmental agencies, the private sector, Extension, and other colleges and universities.

The MITPPC relies on a strategic prioritization process to set its research direction. Financial resources are directed towards research that (i) addresses the invasive terrestrial plants and pests which pose the greatest threat to Minnesota and (ii) has the greatest potential to substantially improve management. A rapid prioritization was completed early in 2015 that highlighted immediate needs for research on brown marmorated stinkbug, oak wilt, and plants on Minnesota’s noxious weed list. A more expansive prioritization is underway. The MITPPC leverages existing expertise and infrastructure at the University, including Research and Outreach Centers located across the state, and the Departments of Entomology, Plant Pathology, Agronomy & Plant Genetics, Horticultural Science, Applied Economics, Fisheries Wildlife & Conservation Biology, Bioproducts & Biosystems Engineering, Plant Biology, and Ecology Evolution & Behavior.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Accelerate research on high priority, established terrestrial invasive species Budget: \$2,740,460

The MITPPC will accelerate research on high risk invasive species already present in Minnesota. The overall goal of this research is to minimize the damage caused by terrestrial invasive species across the state. Management options for well -established species range from containment, to slowing the spread, to Integrated Pest Management (IPM). IPM, the reliance on multiple, compatible strategies to keep plants or pests below damaging levels, may also include new biological control efforts. New tools, technology, and strategies are needed to support these efforts. Foundational to these efforts are accurate statewide maps of the current and future presence or abundance of terrestrial invasive plants and pests. These maps are essential to determine



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where management is needed and provide an objective basis to evaluate the effectiveness of efforts to contain or slow-the-spread of terrestrial invasive species. Training experts in invasive species remains a common, vital goal, so funding for graduate students to work with existing faculty remains a core component of these projects.

Outcome	Completion Date
1. New control methods and technology, including distribution maps	June 30, 2023
2. Research findings on integrated pest management strategies	June 30, 2023
3. Research findings approaches to minimize non-target impacts of control	June 30, 2023

Activity 2: Accelerate research on threatening terrestrial invasive species not yet in MN Budget: \$2,259,540

The MITPPC will fast-track research on high-risk terrestrial plants and pests that are not yet in the state or present but not widely distributed. The management goal is to keep prevent particularly damaging species from arriving in the state or eradicating recent arrivals. Research in this area will focus on technologies and strategies for prediction and prevention and on tools and techniques for early detection and rapid response.

Outcome	Completion Date
1. Research findings for prediction and prevention	June 30, 2023
2. New technologies and strategies for early detection and rapid response	June 30, 2023

III. PROJECT STRATEGY

A. Project Team/Partners

Project teams will be comprised of faculty members and staff from the academic departments at the University of Minnesota with potential collaborators from governmental, non-governmental, and private sector entities as necessary. The composition of the teams will vary depending on which priority species are identified. Research teams are supported by the MITPPC Director, Associate Director, CFANS Dean, and Associate Dean for Research. Partner organizations include USDA Forest Service, Minnesota Department of Agriculture, Minnesota Department of Natural Resources, Minnesota Department of Transportation, Board of Water and Soil Resources, and the Minnesota Forest Resource Council.

B. Project Impact and Long-Term Strategy

Terrestrial invasive species affect every Minnesotan and virtually every terrestrial landscape. Invasive weeds, pathogens, insects, and arthropods threaten to lower the biodiversity and aesthetic value of prairies and wetlands, increase damage to urban and rural forests, and increase economic damage to grain and fruit producers. In total, terrestrial invasive plants and pests cost Minnesotans at least \$3 billion annually.

Additional funding for the MITPPC is needed now accelerate high-priority research. A typical research projects is estimated to cost ~\$150,000/year for 4 years. As a result, a \$5 million investment will support 8 research areas. Research results are needed now because the management of terrestrial invasive species becomes more costly as new plants and pests become established and spread. The MITPPC is currently supported by \$4.86 million from the following funds: \$3.4 million from the 2014 General Fund, \$970,000 from 2011 ENRTF, and \$490,000 from 2014 ENRTF. An additional \$5 million is included in the 2015 ENRTF bill currently before the legislature for consideration.

C. Timeline Requirements

A typical research project takes 3-5 years, and another 3-5 years is needed for implementation. Close collaboration with implementation partners at the outset will allow MITPPC to achieve its goals by 2023.

2016 Detailed Project Budget

Project Title: Minnesota Invasive Terrestrial Plants and Pests Center: Phase 3

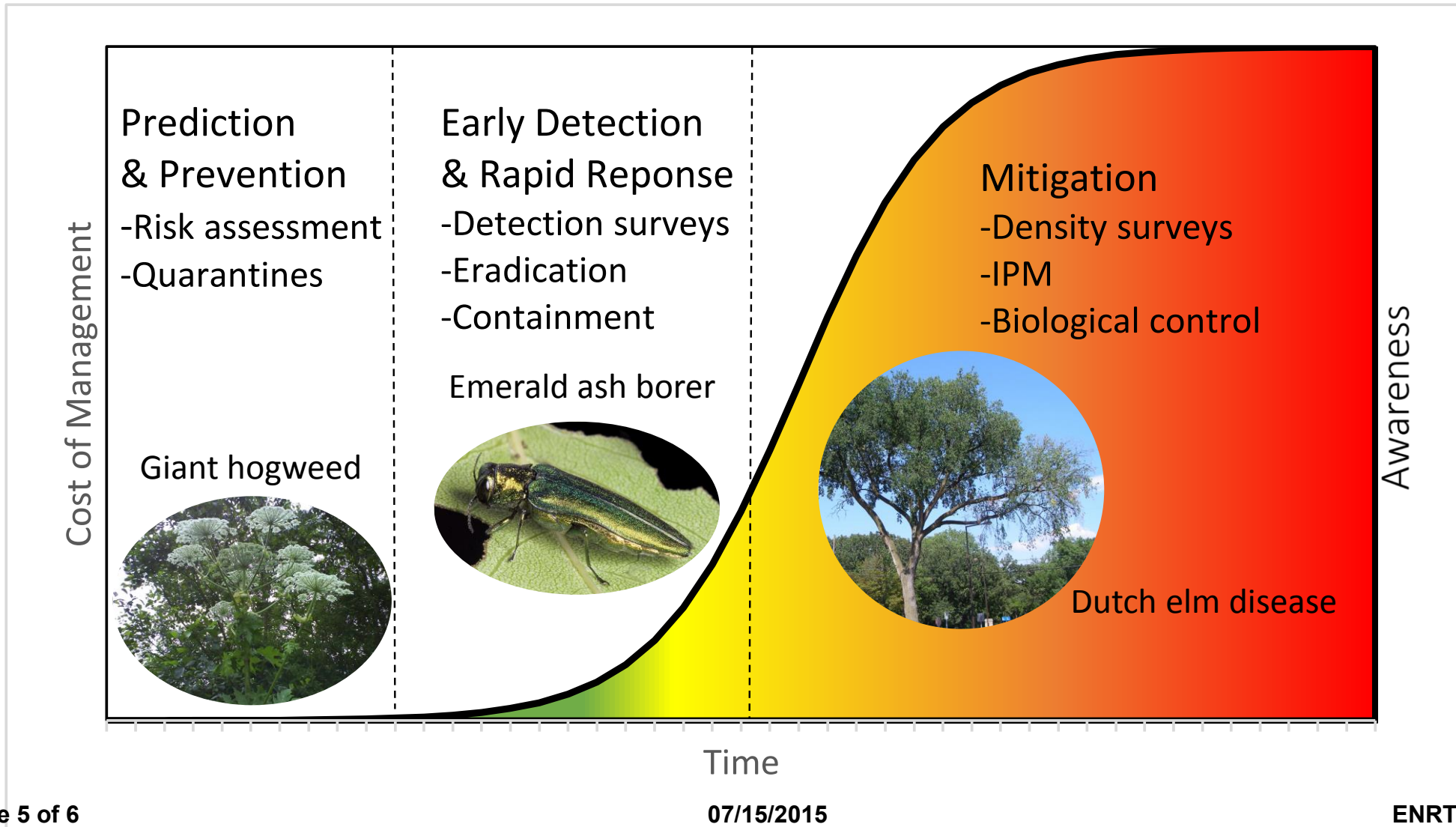
IV. TOTAL ENRTF REQUEST BUDGET 7 years

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
Personnel:	\$ 4,300,800
To be named: 8 research faculty PI, 25% FTE (summer salary) for 4 years: ~\$37,400/yr (66% salary, 33.8% benefits);	
To be named: 8 graduate research assistants (GRAs), 50% FTE (academic year) + 100% FTE (summer) for 4 years: ~\$40,000/yr (56% salary 35% tuition 9% benefits). GRA's are students and are unable to hold more than a 50% appointment during the academic year.	
To be named: 8 postdoctoral associates, 100% FTE for 4 years: ~\$57,000/yr (79% salary, 21.4% benefits)	
Professional/Technical/Service Contracts: Biosecurity Laboratory Space: 3 Projects * 4 years *\$7,200/yr	\$ 86,400
Equipment/Tools/Supplies: Consumable lab materials (e.g., insect rearing supplies, chemicals for polymerase chain reaction, site license for CLIMEX software): \$16,650/yr per project * 8 projects * 4 years. More detail to be provided as specific research projects are proposed.	\$ 532,800
	\$ -
Travel: Travel directly related to research (\$2,500/year per project * 8 projects *4 years) more detail to be provided as specific research projects are proposed) All travel expenses will follow U of MN policy allowances.	\$ 80,000
Additional Budget Items:	\$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =	\$ 5,000,000

V. OTHER FUNDS (This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
Other Non-State: USDA Forest Service, salary for RC Venette to serve as MITPPC Director. Value is given per year (e.g., if Venette remains Director for 3 years, \$168,570 would be the amount) These other funds are not to considered as a cost-share/matching commitment.	\$ 56,910	<i>Secured</i>
Other State \$: General Fund Appropriation: ML 2014, Ch. 312, Art. 12, Sec. 8	\$ 3,400,000	<i>Secured</i>
Other State \$: ENRTF 2015 request	\$ 5,000,000	<i>Pending</i>
In-kind Services To Be Applied To Project During Project Period: Cooperating agencies may provide services (e.g., operation of UAVs, collection and distribution of data) for particular research projects. The value of these contributions will be determined as research projects are identified.	To be determined	<i>Pending</i>
Funding History: ENRTF ML 2014, Ch. 312, Art. 12, Sec. 8	\$ 1,460,000	<i>Secured</i>
Remaining \$ From Current ENRTF Appropriation:	\$ 1,460,000	

Changes in Management Options, Costs, and Research Priorities during the Spread of Terrestrial Invasive Species



Environment and Natural Resources Trust Fund (ENRTF)

2016

Project title: Minnesota Invasive Terrestrial Plants and Pests Center: Phase 3

Project Manager Qualifications: Dr. Robert C. Venette

The Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) is conceived as a collegiate level initiative in the College of Food, Agricultural and Natural Resource Sciences (CFANS) at the University of Minnesota. The research by its nature is multi-disciplinary (FWCB, Entomology, Horticulture, Agronomy, Forestry, Plant Pathology, Bio-Engineering and Applied Economics) all have a role to play. The MITPPC is led by an Executive Director, Dr. Robert Venette. The Executive Director reports directly to Dr. Greg Cuomo, Associate Dean for Research in CFANS, and Professor Brian Buhr, Dean of CFANS and Director of the Minnesota Agricultural Experiment Station.

Dr. Venette received his PhD in Ecology from the University of California, Davis in 1997. He was appointed Director of the MITPPC in January 2015. He continues to be a Research Biologist with the USDA, Forest Service, Northern Research Station and Adjunct Associate Professor of Entomology at the University of Minnesota. He is the current Chair of the Minnesota Invasive Species Advisory Council and has led the International Pest Risk Mapping Workgroup. Dr. Venette specializes in the areas of pest risk assessment and invasion biology. His research primarily focuses on invasive insects, pathogens, and plants that are not known to occur in the United States (yet) or are present but of limited distribution. He has authored or co-authored 65 peer-reviewed research articles, more than 250 research presentations, and a text book, and raised over \$9.8 million in research grants. He has advised or co-advised 12 graduate students. Dr. Venette has been responsible for conceiving research ideas, assembling interdisciplinary teams, securing funding, conducting research, disseminating results, and remaining accountable for the expenditures of funds. As such, Dr. Venette has the qualifications to manage joint and interdisciplinary projects such as MITPPC and has demonstrated success in doing so throughout his career. He has the managerial, personnel, and financial skills necessary to successfully implement a diverse project of this scale.