



# Environment and Natural Resources Trust Fund (ENRTF)

## M.L. 2016 Work Plan

**Date of Report:** June 3, 2016

**Date of Next Status Update Report:** January 31, 2017

**Date of Work Plan Approval:** June 7, 2016

**Project Completion Date:** June 30, 2023

**Does this submission include an amendment request?**

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**PROJECT TITLE:** Minnesota Invasive Terrestrial Plants and Pests Center – Phase III

**Project Manager:** Robert Venette

**Organization:** Regents of the University of Minnesota

**Mailing Address:** 1992 Folwell Ave.

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**Location:** Statewide

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**Total ENRTF Project Budget:**

**ENRTF Appropriation:** \$3,750,000

**Amount Spent:** \$0

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**Balance:** \$3,750,000

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**Legal Citation:** M.L. 2016, Chp. 186, Sec. 2, Subd. 06a

**Appropriation Language:**

\$3,750,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota for the Invasive Terrestrial Plants and Pests Center to conduct research to prevent, minimize, and mitigate the threats and impacts posed by terrestrial invasive plants, pathogens, and pests to the state's prairies, forests, wetlands, and agricultural resources. This appropriation is available until June 30, 2023, by which time the project must be completed and final products delivered.

**I. PROJECT TITLE:** Minnesota Invasive Terrestrial Plants and Pests Center, Phase III

**II. 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);

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 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.

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 more expansive prioritization is nearing completion and will guide the construction of future Requests for Funding.

**III. OVERALL PROJECT STATUS UPDATES:**

- Status as of *January 31, 2017:***
- Status as of *July 31, 2017:***
- Status as of *January 31, 2018:***
- Status as of *July 31, 2018:***
- Status as of *January 31, 2019:***
- Status as of *July 31, 2019:***
- Status as of *January 31, 2020:***
- Status as of *July 31, 2020:***
- Status as of *January 31, 2021:***
- Status as of *July 31, 2021:***
- Status as of *January 31, 2022:***
- Status as of *July 31, 2022:***
- Status as of *January 31, 2023:***

**Overall Project Outcomes and Results:**

#### **IV. PROJECT ACTIVITIES AND OUTCOMES:**

##### **ACTIVITY 1: Accelerate research on high priority terrestrial invasive species**

###### **Description:**

By using funds from the 2014 General Fund appropriation, the MITPPC conducted a rapid prioritization in the spring of 2015 to identify immediate research needs among state agencies with primary responsibility for the management of terrestrial invasive plants and pests on public and private lands. The resulting Request for Proposals resulted in four projects that were funded under an ML 2014 ENRTF appropriation.

A more expansive research prioritization was initiated in May 2015 to systematically evaluate threats posed by a wider array of terrestrial invasive plants, pathogens, and insects/arthropods. The more expansive prioritization will be used to allocate the remaining research funds from the M.L. 2014 and M.L. 2015 ENRTF appropriations.

Upon the completion of the expansive research prioritization, MITPPC will prepare a request for proposals and work-plans to conduct research to address identified priority invasive species. Proposals will be sent for peer review to ad hoc scientific reviewers in the field of research, which will allow for rapid turnaround of proposals to expedite work to be completed. The ad hoc scientific reviewers will make recommendations to MITPPC's Director on the suitability of the project for funding. Final award decisions will be made with the consent of the Associate Dean for Research and/or the Dean (both College of Food, Agricultural and Natural Resources Sciences, University of Minnesota). A small portion of funds (not to exceed 30% of this allocation) will be held to conduct research on emerging issues that might not have been addressed during the prioritization or to conduct cross-cutting research that addresses more than one priority species.

These selected proposals are to be considered sub-projects with respect to this work plan. Detailed sub-project work plans and budgets will be submitted to LCCMR for review and approval. The details about each sub-project work plan will be included as attachments to this document. Regular activity updates and budget updates will be provided by sub-project leaders and MITPPC to LCCMR. This overarching work plan and budget will be updated accordingly to include general progress of the Center and a synopsis of activities completed by each sub-project. The budget updates for this overall work plan will provide summaries of expenditures (by budget line item) for each sub-project. Detailed sub-project reports and associated budget updates will be prepared by investigators in cooperation with the MITPPC Director and Associate Director. MITPPC will provide LCCMR with updates to this overall work plan and each sub-project as a single packet.

The Center will initiate and/or accelerate coordinated, applied research according to the prioritized list of pest and plant species that threaten Minnesota's prairies, urban and rural forests, wetlands, and agricultural resources as identified through this assessment process. Depending on the net impacts associated with each species, research may include new control methods including bio-control and technology, development of integrated pest management tools that minimize non-target impacts of control, early detection of and/or rapid response to new threats, and establishment prevention. The Center infrastructure is vital to improving Minnesota's capacity and response time to preventing and limiting introduction of new terrestrial invasive species. All research projects will include an analysis of any consequences related to the management of prioritized species to the State's non-target flora, fauna or our soils, water and climate.

Workforce development and training experts in invasive species management is also critical. A core component of each project will be funding of graduate students and postdoctoral associates to work with existing faculty.

Existing faculty with less than 12-month appointments may include in the budget up to 25% of their time in their role as the project leader. Providing salary through these awards will secure faculty time and intellectual effort in the projects, assuring that we are attracting the resources to provide project design, effort, and mentoring of the graduate students and post-docs in their research development. We do not anticipate hiring any new faculty for the projects.

The Center will support multiple projects by research teams, each comprised of a UMN faculty member from one of the participating departments, one graduate student and one postdoctoral associate. Estimated funding per project will be \$180,000-210,000 per year, for three to four years. We expect this to result approximately five projects in two separate phases, depending upon the priority identified by the annual risk assessment planning. It is expected that per project expenses for established invasive species will be higher as compared to prevention strategies.

**Summary Budget Information for Activity 1:**

**ENRTF Budget:** \$ 3,750,000  
**Amount Spent:** \$ 0  
**Balance:** \$3,750,000

<b>Outcome</b>	<b>Completion Date</b>
<b>1.</b> Request for proposals released	August 31, 2016
<b>2.</b> Initial research projects selected and launched (est. 5 projects, ranging from 3-4 years each)	May 31, 2017
<b>3.</b> Research findings for projects completed	May 31, 2024

- Status as of January 31, 2017:
- Status as of July 31, 2017:
- Status as of January 31, 2018:
- Status as of July 31, 2018:
- Status as of January 31, 2019:
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- Status as of January 31, 2020:
- Status as of July 31, 2020:
- Status as of January 31, 2021:
- Status as of July 31, 2021:
- Status as of January 31, 2022:
- Status as of July 31, 2022:
- Status as of January 31, 2023:

**Final Report Summary:**

**V. DISSEMINATION:**

**Description:**

Findings will be shared with agencies and citizen groups so that public information and decision making is based on the best available science. Updates on progress and research results will be disseminated through University of Minnesota, College of Food, Agricultural, and Natural Resource Sciences, and College of Biological Sciences via websites, social media, and publications. Media releases will also be used when warranted. Additionally, findings will be presented at local and national conferences and via peer-reviewed publication and student theses.

- Status as of January 31, 2017:
- Status as of July 31, 2017:
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- Status as of January 31, 2019:
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- Status as of January 31, 2020:
- Status as of July 31, 2020:
- Status as of January 31, 2021:
- Status as of July 31, 2021:

Status as of January 31, 2022:

Status as of July 31, 2022:

Status as of January 31, 2023:

**Final Report Summary:**

**VI. PROJECT BUDGET SUMMARY:**

**A. ENRTF Budget Overview:**

This section represents an overview of the preliminary budget at the start of the project. It will be reconciled with the actual expenditures at the time of the final report. See the sub-project budget documents for an up-to-date project budget, including any changes resulting from amendments.

<b>Budget Category</b>	<b>\$ Amount</b>	<b>Overview Explanation</b>
Personnel:	\$ 3,225,600	<ul style="list-style-type: none"><li>• 6 research faculty, 25% FTE (summer salary) for 4 yrs: \$37,400/yr (66% salary, \$33.8% benefits.</li><li>• 6 grad research asst (GRA), 50%FTE (academic yr) + 100% FTE (summer) for 4 yrs: \$40,000/yr (56% salary, 35% tuition, 9% benefits) GRAs are students and are unable to hold more than 50% appointment during the academic year.</li><li>• 6 post-doc assoc., 100% FTE for 4 yrs: \$57,000/yr (79% salary, 21.4% benefits</li></ul>
Professional/Technical/Service Contracts:	\$64,800	Professional services and contracts for data storage, sequencing, biochemistry, microscopy, bio-containment facility storage, technical and engineering contracts, fees, or honoraria for guest lecturer. More detail to be provided as specific research projects are proposed.
Equipment/Tools/Supplies:	\$399,600	Consumable lab materials, specimens, polymerase chain reaction, pots, fertilizers for plant propagation, non-capital lab or field equipment, pipettes, balances heat block, vortex. More detail to be provided as specific research projects are proposed.
Travel Expenses in MN:	\$60,000	Travel directly related to research for mileage, lodging, meals (appr. \$2,500/yr/project) Other domestic travel to conferences, meetings, other mileage. All travel will follow UMN policy allowances. More detail to be provided as specific research projects are proposed.
Other:	\$0	
<b>TOTAL ENRTF BUDGET:</b>	<b>\$3,750,000</b>	

**Explanation of Use of Classified Staff:**

**Explanation of Capital Expenditures Greater Than \$5,000:** 0

**Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation:** 10.5 FTE

**Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF  
Appropriation: 0**

**B. Other Funds:**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
<b>Non-state</b>			
<b>State</b>			
UMN indirect cost recovery @52%	\$1,950,000		
<b>TOTAL OTHER FUNDS:</b>	<b>\$1,950,000</b>		

**VII. PROJECT STRATEGY:**

**A. Project Partners:**

Project Partners (not receiving funds):

- USDA Forest Service Northern Research Station
- Minnesota Department of Agriculture
- Minnesota Department of Natural Resources
- Minnesota Forest Resource Council
- Agencies and organizations involved in invasive species outreach programs so public information is based on the best available science.
- Networks of citizen scientists could be an important part of implementing early detection programs and monitoring the effectiveness of control efforts.

This will be updated in more detail once the priorities for research are established.

**B. Project Impact and Long-term Strategy:**

The Center’s ultimate goal is to eliminate, reduce, mitigate or prevent the introduction, expansion or damage done by terrestrial invasive species in Minnesota. Metrics of success include: threat awareness, response efficiency, control effectiveness, non-target species protection, and mitigation strategies. Ancillary goals include: workforce development, citizen engagement, focused research strategies, improved response time to emerging threats, and improved coordination of efforts.

Success will depend on the ability to marshal multi-disciplinary teams in timely and prioritized ways to deliver results. Funding provided will be used to support additional multi-disciplinary research teams. With adequate funding, the Center’s efforts are expected to result in numerous, effective prevention and control methods within an eight year time frame for a significant portion of the species upon which we will focus.

**C. Funding History:**

Funding Source and Use of Funds	Funding Timeframe	\$ Amount
ML 2014 Chapter 312, Article 12, Section 8 (general fund)	6/30/2022	\$3,400,000
M.L. 2014, Ch. 312, Art. 12, Section 8 (ENRTF)	6/30/2022	\$1,460,000
M.L. 2015, Ch. 76, Sec. 2, Subd. 6a (ENRTF)	6/30/2023	\$5,000,000

**IX. VISUAL COMPONENT or MAP(S):** See attached

**X. RESEARCH ADDENDUM:** Peer review will be conducted by internal UMN process and documentation to be provided to LCCMR.

**XI. REPORTING REQUIREMENTS:**

Periodic work plan status update reports will be submitted no later than January 31 and July 31 each year (every six months). A final report and associated products will be submitted between June 30 and August 15, 2023.

**Environment and Natural Resources Trust Fund  
M.L. 2016 Project Budget**



**Project Title:** Minnesota Invasive Terrestrial Plants and Pests Center – Phase III

**Legal Citation:** M.L. 2016, Chp. 186, Sec. 2, Subd. 06a

**Project Manager:** Robert Venette

**Organization:** Regents of the University of Minnesota

**M.L. 2016 ENRTF Appropriation:** \$3,750,000

**Project Length and Completion Date:** June 30, 2023

**Date of Report:** June 3, 2016

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	TOTAL BUDGET	TOTAL BALANCE
<b>BUDGET ITEM</b>	<i>Accelerate research on high priority terrestrial invasive species</i>				
<b>Personnel (Wages and Benefits)</b>	\$3,225,600		\$3,225,600	\$3,225,600	\$3,225,600
To be named: 6 research faculty, 25% FTE (summer salary) for 4 yrs: \$37,400/yr (66% salary, 33.8% benefits)	\$897,600		\$897,600	\$897,600	\$897,600
To be named: 6 graduate research assistants (GRAs), 50% FTE (academic yr) + 100% FTE (summer) for 4 yrs: \$40,000/yr (56% salary, 35% tuition, 9% benefits) GRAs are students and are unable to hold more than a 50% appointment during the academic year.	\$960,000		\$960,000	\$960,000	\$960,000
To be named: 6 postdoctoral associates, 100% FTE for 4 yrs: \$57,000/yr (79% salary, 21.4% benefits)	\$1,368,000		\$1,368,000	\$1,368,000	\$1,368,000
<b>Professional/Technical/Service Contracts</b>	\$64,800		\$64,800	\$64,800	\$64,800
<i>This may include items within the below categories. More detail to be provided as specific research projects are proposed, as applicable.</i>					
<i>Services - Lab (e.g. data storage, sequencing, biochemistry, microscopy)</i>	\$0		\$0	\$0	\$0
<i>Professional services and contracts (e.g. biocontainment facility storage, technical and engineering contracts, fees, or honoraria for guest lecturer and speakers)</i>			\$0	\$0	\$0
<b>Equipment/Tools/Supplies</b>	\$399,600		\$399,600	\$399,600	\$399,600



<i>This may include items within the below categories. More detail to be provided as specific research projects are proposed, as applicable.</i>					
<i>Consumable lab materials, specimens, and other expenses directly related to research.</i>					
<i>Supplies - lab or infield (e.g. polymerase chain reaction chemicals, pots, soil, fertilizer for plant propagation; ingrediants for insect diet; confinement cages for insect rearing</i>					
<i>Equipment - non-capital lab or field (e.g. pipettes, balances, lab glassware, laptop, heat block, vortex, mini-centrifuge)</i>					
<b>Capital Expenditures Over \$5,000</b>	\$0		\$0	\$0	\$0
<i>More detail to be provided as specific research projects are proposed, as applicable.</i>					
<b>Printing</b>	\$0		\$0	\$0	\$0
<i>More detail to be provided as specific research projects are proposed, as applicable.</i>					
<b>Travel expenses in Minnesota</b>	\$60,000		\$60,000	\$60,000	\$60,000
<i>This may include items within the below categories. More detail to be provided as specific research projects are proposed, as applicable. Travel is directly related to research for mileage, lodging, and meals (appr. \$2,500/year per project).</i>					
<i>Travel- MN (e.g. mileage, conferences, meetings) All travel will follow UMN policy allowances.</i>					
<i>Travel - domestic (e.g. mileage, conferences, meetings)</i>					
<b>Other</b>					
<i>More detail to be provided as specific research projects are proposed, as applicable.</i>					
<b>COLUMN TOTAL</b>					
	\$3,750,000		\$3,750,000	\$3,750,000	\$3,750,000

