



## Environment and Natural Resources Trust Fund

### 2026 Request for Proposal

#### General Information

**Proposal ID:** 2026-256

**Proposal Title:** Education on Land Management to Protect Beneficial Insects

#### Project Manager Information

**Name:** Vera Krischik

**Organization:** U of MN - College of Food, Agricultural and Natural Resource Sciences

**Office Telephone:** (612) 625-7044

**Email:** krisc001@umn.edu

#### Project Basic Information

**Project Summary:** Land management of urban forests, restorations, and backyards to reduce pesticide use, manage pests, and conserve beneficial insects requires accessible online educational materials, such as courses, videos, manuals, and bulletins.

**ENRTF Funds Requested:** \$306,000

**Proposed Project Completion:** June 30, 2029

**LCCMR Funding Category:** Land (F)

#### Project Location

**What is the best scale for describing where your work will take place?**

Statewide

**What is the best scale to describe the area impacted by your work?**

Statewide

**When will the work impact occur?**

During the Project and In the Future

## Narrative

**Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.**

Pesticide use in urban areas is identified by the Fish and Wildlife Service and researchers as contributing to the decline of endangered rusty-patched bumblebee and monarch butterflies. Professionals and consumers need an accessible online website to go to for information on beneficial insect friendly (bee, butterfly, and biocontrol agents) IPM (integrated pest management). This website will link to other Minnesota state and university sites and will not duplicate other websites.

IPM is a sustainable, integrated approach that utilizes cultural, biological and chemical tactics to minimize economic, health, and environmental risks. Past LCCMR funding permitted the development of a website called "IPM and Pollinator Conservation" containing bulletins and insect identification information (<https://ncipmhort.cfans.umn.edu> and <https://pesticidecert.cfans.umn.edu/>; 1,200 visits/mo). We were motivated by our recent LCCMR grant in Minneapolis which revealed that 40 homeowners had their lawns destroyed by insects as they used the wrong insecticide.

We will update the online 300 page 2004 IPM manual and update 3 courses (Pollinator conservation IPM, Turf and tree IPM, and Greenhouse IPM) with videos to engage professionals and consumers. A new website section will provide information on management to conform with new EPA endangered species regulations.

**What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.**

It is often difficult for managers to find pollinator friendly pest management information. For instance, pymetroxine (Endeavor) can replace neonicotinoid insecticides, as its chemistry affects sucking insects, such as aphids, and it is bee friendly. Spinosad (Conserve) can replace organophosphates, pyrethroids, and carbamates for sawfly and beetle larvae, and is bee-friendly.

The bulletin entitled "Understanding pesticide toxicity to pollinators" is essential for growers and managers to use so that the toxicity of insecticides to non-target beneficial insects can be determined and the appropriate insecticide can be used. A video and chapter in a course needs to explain how. Discussion of this information will help beneficial insect conservation and should be a key element of landscape and greenhouse management.

The current LCCMR sponsored website contains a 300-page 2004 IPM manual that needs to be updated. The USDA NCERA 224 members from various universities have agreed to help update the manual with 30 new pest profiles and 15 new introductory chapters. The manual and other online resources will serve as a library for the 3 online course (Pollinator conservation IPM, Turf and tree IPM, and Greenhouse IPM) that were partially developed on the website to show the their feasibility and potential.

**What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?**

Land managers from gardeners to professionals need to have access to a website with educational materials and courses on beneficial insect IPM (integrated pest management). Our motivation for these educational materials came from a LCCMR sponsored field project where homeowners lost their lawns by using the wrong organic insecticide.

These educational materials will provide information to change land managers knowledge and their management behavior. Education will result in the reduction in the use of broad spectrum insecticides that kill beneficial insects and result in pollinator conservation. Surveys performed pre- and post- educational event will capture changes in knowledge and behavior.

## Activities and Milestones

### Activity 1: Create three online IPM courses on land management to conserve pollinators and beneficial insects

**Activity Budget:** \$156,000

**Activity Description:**

On the Pollinator Conservation website, the IPM manual will serve as the text for the courses. We will update the 3 partially developed online courses (Pollinator conservation IPM, Turf and tree IPM, and Greenhouse IPM) with videos to engage professionals and consumers. When finished the 3 courses will contain power points, links to related websites, bulletins, videos, and self- grading tests. Upon completion the student will receive an IPM certificate.

The courses and educational materials will be available at the Pollinator Conservation website and the UMN Professional development website (<https://online.umn.edu/professional-development-online-courses>). A pre and post survey for each video will establish changes in IPM knowledge, practices, and adoption.

Our lab has experience with websites, online courses, and certificates, from 3 partially developed online courses and 3 completed online courses.

We have 3 completed courses, that include 2 online courses are at the National USDA extension website called, "Managing invasive species in landscapes" <https://campus.extension.org/enrol/index.php?id=1245> and "Pollinator Decline" <https://campus.extension.org/course/view.php?id=1244>. In addition, we have an online Pesticide Certification Course at the MN Nursery and landscape association website since 2020 and in person since 2000.

**Activity Milestones:**

Description	Approximate Completion Date
Create and offer 3 online courses on managing land with IPM and pollinator friendly insecticides	March 31, 2029

### Activity 2: Update the online IPM manual to include beneficial insect/pollinator conservation that will be used in the online courses

**Activity Budget:** \$150,000

**Activity Description:**

IPM promotes the use of cultural, biological and chemical tactics to manage pest insects, while conserving pollinators and beneficial insects. IPM is a sustainable, integrated approach that utilizes tools and tactics to minimize economic, health and environmental risks.

The implementation of the Environmental Protection Agency (EPA) Food Quality Protection Act (FQPA) of 1996 has resulted in cancellation of registrations of key broad-spectrum insecticides formerly used to manage pests. New insecticides have emerged to replace broad spectrum insecticides, but their range of activity tends to be much more specific and their residual activity shorter. However, detailed information about pest biology and life-history and efficacy of new products need to be transferred to pest managers. For the transfer of this information an updated IPM manual and website is invaluable.

The current 2004 online IPM manual that is 300 pages lwill be updated in three ways. The USDA NCERA 224 members from various universities have agreed to help update the manual with 30 new pest profiles, add beneficial insect friendly

pesticides to 198 current pest profiles, add 15 new introductory chapters, add a section on how to manage lands with endangered species to comply with new EPA labels, and update other sections.

**Activity Milestones:**

Description	Approximate Completion Date
Update 15 introductory chapters in the IPM manual	September 30, 2028
Add pesticide IRAC numbers (modes of action) explain their use, add beneficial insect friendly pesticides	September 30, 2028
Add 30 new pest profiles such as ambrosia beetles, Lanternfly, chilli thrips, brown marmorated, etc	September 30, 2028
Add a new manual section on the new EPA labels for endangered species management	September 30, 2028

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
NCERA 224 IPM of trees and turf, meeting for 30 yr, Vera Krischik has been chair for many years. The current chair for 2025 is Dr. Zee Ahmed of Clemson University, South Carolina. The 15 members of the group will help edit and write the materials.	NCERA 224 Landscape and nursery IPM	Collaborators who will create the 15 introductory manual chapters; read and edit pest profiles and the online courses and manual; help promote the use of the online manual and courses.	No

## Long-Term Implementation and Funding

**Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?**

The completed 3 courses and updated IPM manual will provide technical information on beneficial insect conservation for land managers. There is a need to coordinate regional outreach programs in an era of increasingly limited resources to address insect problems and beneficial insect conservation for landscapes, greenhouses, nurseries, and parks. An updated IPM manual, online courses, and website will bring quality IPM information to growers, gardeners, commodity groups, parks, arboretums, Extension Educators, and Master Gardeners.

In the future, the website and courses will be maintained by UMN Arboretum specialists, UMN Extension Educators, and UMN faculty.

## Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Invasive Species Biocontrol in Bee Lawns and Parklands	M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 06d	\$425,000
Mitigating the Spread of Invasive Jumping Worms	M.L. 2024, , Chp. 83, Art. , Sec. 2, Subd. 06b	\$470,000

## Project Manager and Organization Qualifications

**Project Manager Name:** Vera Krischik

**Job Title:** Associate Professor University of Minnesota

**Provide description of the project manager's qualifications to manage the proposed project.**

My research promotes sustainable management using biorational insecticides and by releasing biocontrol agents of pests to reduce reliance on pesticides that have potential non-target impacts on beneficial insects and pollinators. In 2023 a part of an LCCMR grant, I worked with 40 households in Minneapolis and learned that they were applying the wrong bacterial insecticide that was ineffective. This compelled me to submit this proposal to create online courses and website to educate professional and consumer landscape managers on conserving beneficial insects through IPM.

I currently have two active websites, <https://ncipmhort.cfans.umn.edu/> called the IPM for greenhouse, nursery, and landscape website

and <https://pesticidecert.cfans.umn.edu/> called the Pollinator Conservation and IPM website.

The CUES website is a companion to an in-person and online course that I give on training on pesticide information and IPM for the MN Pesticide License in cooperation with MDA, MNLA, and UM for the last 20 years.

I develop site and pest specific IPM (Integrated Pest Management) programs for the MN green industry, which includes commodity groups (landscapes, turf, greenhouse, nursery, and Christmas trees), Master Gardeners, extension educators, and the public on Pollinator Conservation IPM, pesticide safety training and IPM.

Each year, I speak at annual meetings of the MN Nursery and Landscape Association (MNLA) in January at the Northern Green Expo (3,600 attendees), the MN Shade Tree Short Course (STSC) in March (300 attendees), the MN Christmas Tree Association (MTCA) in March (80 attendees), and the MN Golf Course Superintendents (MNGSA) meeting in November (120 attendees). Each March since 1998 in-person and since 2020 online, I give a 2 day certification workshop with MNLA and MDA that I created.

In 2024 I opened 2 grants on invasive species, one on pathogens of Japanese beetle and another on jumping worms.

**Organization:** U of MN - College of Food, Agricultural and Natural Resource Sciences

**Organization Description:**

Associate Professor Vera Krischik is a CFANS, University of Minnesota professor and IPM specialist with 34 years of experience promoting Integrated Pest Management (IPM), biocontrol, and compatible insecticides to protect pollinators and other good bugs in greenhouses, nurseries, lawns, urban forests, parks, and restorations, <https://entomology.umn.edu/people/vera-krischik>.

Our lab's research identifies the best ways to manage pests through IPM to reduce non-target effects on native pollinators and biocontrol insects, such as parasitoids, lady beetles, native butterflies, and native bees, such as rusty patched bumblebee, *Bombus affinis*, and blue orchard bee, *Osmia lignaria*. Data from our site specific IPM and biocontrol program is promoted by sharing our expertise at national, state, and local research and outreach meetings.

Our lab was requested to be on a technical committee to help the Minneapolis Park Rec Board to develop IPM programs for their parks. We are members of two national committees on IPM for landscapes, two national committees on monarch and rusty patched bumblebee, USDA grant panels that review proposals associated with pollinators, and local efforts by businesses and municipalities to develop IPM programs. Every year we train pesticide applicators on how to correctly use pesticides in MDA, MNLA, UMN workshops.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Principal investigator		Provides administrative and technical oversight			0%	60		-
Post Doc		Works with the PI on creating the website, updating the manual, and creating three online courses.			25.9%	3		\$243,000
Undergraduate technical help		Help write and edit website, course materials, and manual, \$17hr is the departmental rate			0%	1.5		\$40,000
							<b>Sub Total</b>	<b>\$283,000</b>
<b>Contracts and Services</b>								
							<b>Sub Total</b>	-
<b>Equipment, Tools, and Supplies</b>								
							<b>Sub Total</b>	-
<b>Capital Expenditures</b>								
							<b>Sub Total</b>	-
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								
	Conference Registration Miles/ Meals/ Lodging	10 trips year	Outreach to provide talks to different groups on the online resources.					\$3,000
							<b>Sub Total</b>	<b>\$3,000</b>
<b>Travel Outside Minnesota</b>								

	Conference Registration Miles/ Meals/ Lodging	Attend at least 3 annual conferences and provide a talk or organize a symposium.	Outreach talk to promote the online resources.					\$5,000
							<b>Sub Total</b>	<b>\$5,000</b>
<b>Printing and Publication</b>								
	Printing	Printing of materials for outreach talks and for working on editing the sites.	Printing of materials for outreach talks and for working on editing the sites.					\$3,200
	Publication	Adobe Indesign to update the IPM manual; attempted and it does work	Update IPM manual in the desktop publishing software InDesign					\$1,800
	Publication	Publish 3 peer review science education articles on outreach educational courses using pre and post survey for the online courses.	The fee for publishing 3 papers in peer-reviewed journals					\$5,000
							<b>Sub Total</b>	<b>\$10,000</b>
<b>Other Expenses</b>								
		Dell	Optiplex work station \$1450 two monitors\$275 x 2=\$550 mouse, keyboard, storage media, speakers, video camera \$1500	X				\$3,500
		Shipping costs to mail disks with manual and course materials to collaborators	Mailing costs to mail disks with manual and course materials to collaborators					\$1,500
							<b>Sub Total</b>	<b>\$5,000</b>
							<b>Grand Total</b>	<b>\$306,000</b>



## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Other Expenses		Dell	UMN does not pay for computers. All the labs computers are 8+ years old. The computer will have a larger video card to edit the videos for the courses and store them in the Krischiklab's UTube account. Optiplex work station \$1450 two monitors\$275 x 2=\$550 mouse, keyboard, storage media, speakers, video camera \$1500

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
			Non State Sub Total	-
			Funds Total	-

Total Project Cost: \$306,000

This amount accurately reflects total project cost?

Yes

## Attachments

### Required Attachments

#### *Visual Component*

File: [2951e248-c82.pdf](#)

#### *Alternate Text for Visual Component*

Update the online 2004 IPM manual to include 30 new pest profiles, update the 198 current pest profiles, and add 15 new introductory chapters. Finish 3 online courses (Pollinator conservation IPM, Turf tree IPM, and Greenhouse IPM). Add a website section on EPA labels and land management for endangered species....

### Supplemental Attachments

#### *Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other*

Title	File
2026-256 UMN SPA authorization letter	<a href="#">4b2cc2d8-be4.pdf</a>
2025 256 Goggle analytics for 1000/mo website visits	<a href="#">e8a59adf-d3c.pdf</a>
2025-256 Dr. Brandon Miller UMN letter of support.pdf	<a href="#">c60bea84-5e9.pdf</a>
2025-256 Dr. Zee Ahmed Clemson U letter of support.pdf	<a href="#">6552f709-fc2.pdf</a>
2025-256 Chris Aumock GCSA letter of support	<a href="#">8db73157-26b.pdf</a>
2026-256 Dr. Enrico Bonello Ohio State University letter of support	<a href="#">1884c820-d3d.pdf</a>
2025-256 Cassie Larson MNLA letter of support.pdf	<a href="#">fc0f84bd-b95.pdf</a>
2026-256 LCCMR budget justification Krischik.pdf	<a href="#">0340a8ef-a72.pdf</a>
2026-256 Erin Buchholz MN arboretum land management specialist letter of support.pdf	<a href="#">ef67830c-0b4.pdf</a>

### Administrative Use

**Does your project include restoration or acquisition of land rights?**

No

**Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?**

Yes, I understand the UMN Policy on travel applies.

**Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?**

No

**Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?**

N/A

**Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?**

N/A

**Does your project include original, hypothesis-driven research?**

Yes

**Does the organization have a fiscal agent for this project?**

Yes, Sponsored Projects Administration

**Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing \$10,000 or more or large-scale stream or wetland restoration?**

No

**Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care, treatment, education, training, instruction, or recreation to children")?**

No

**Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:**

Riana Fletcher

Principal Grants and Contracts Officer

Sponsored Projects Administration

Authorized Organizational Representative

letter attached

**Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements**

N/A