



Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2019 ENRTF Work Plan (Main Document)

Today's Date: June 7, 2019

Date of Next Status Update Report: March 1, 2020

Date of Work Plan Approval:

Project Completion Date: June 30, 2022

Does this submission include an amendment request? No

PROJECT TITLE: Native Bee Survey

Project Manager: Jessica Petersen

Organization: Minnesota Department of Natural Resources

College/Department/Division: Division of Ecological and Water Resources

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Web Address: www.dnr.state.mn.us/pollinators

Location: Aitkin, Beltrami, Carlton, Cass, Chisago, Clearwater, Cook, Crow Wing, Hubbard, Itasca, Kanabec, Koochiching, Lake, Lake of the Woods, Mille Lacs, Pine, St. Louis, and Wadena Counties.

Total Project Budget: \$600,000

Amount Spent: \$0

Balance: \$600,000

Legal Citation: M.L. 2019, First Special Session, Chp. 04, Art. 2, Subd. 03s

Appropriation Language:

\$600,000 the first year is from the trust fund to the commissioner of natural resources to continue to assess the current status and distribution of native bee pollinators in Minnesota by expanding surveys into the coniferous-deciduous forest region of Minnesota and facilitating interagency collaboration and public outreach on pollinators.

I. PROJECT STATEMENT:

Complete the statewide bee survey by surveying at up to 75 sites in the Laurentian Mixed Forest Province, thus building the foundation for detecting changes in bee fauna through time.

Need. The wild bee diversity in Minnesota was largely undescribed prior to ENRTF investments in wild bee surveys in the Prairie Parkland Province, Tallgrass Aspen Parklands Province, and Eastern Broadleaf Forest Province. This project proposes bee surveys in the remaining portion of the state, the Laurentian Mixed Forest (LMF) Province, thereby completing the statewide baseline bee survey. The LMF covers 43% of the state, but counties are under-sampled and proportionally few wild bee studies have been conducted there. Only 12% of bee specimens housed in insect collections reviewed by the MNDNR were collected from counties in the LMF. Similarly, only 14% of Minnesota Wild Bee Atlas records fall within the LMF. Likewise, little is known about the plant associations of bee species in the LMF. We propose surveying the bee community in a variety of habitats (e.g., conifer and mixed conifer-hardwood forests, lowland conifer swamps and peatlands) in each county.

Wild bees, such as bumble bees and leafcutter bees, are vital components of Minnesota’s forest ecosystems. Bees, along with other animals, pollinate an estimated 78% of plants in the temperate ecosystems – thereby supporting native plant communities that store carbon, prevent soil erosion and provide food and shelter for wildlife. Data from baseline bee surveys are used to make important conservation decisions. For example, previous surveys in the prairies and broadleaf forests have filled information gaps by providing data on species distributions for federal listing proposals for Rusty-patched bumble bee and Yellow-banded bumble bee.

Goals of the project:

1. Expand and enhance our knowledge of Minnesota’s wild bees and their plant associations by documenting bees from LMF habitats,
2. Manage data in an existing centralized database,
3. Deliver project results and information for all Minnesotans, and
4. Deliver outreach programs focused on Minnesota wild bee identification and monitoring.

This project will form the foundation upon which future research and monitoring of trends in bee diversity and distribution will be based.

II. OVERALL PROJECT STATUS UPDATES:

First Update March 1, 2020

Second Update September 1, 2020

Third Update March 1, 2021

Fourth Update September 1, 2021

Fifth Update March 1, 2022

Final Report between project end (June 30) and August 15, 2022

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1 Title: Wild bee surveys in the Laurentian Mixed Forest

Description: Bee surveys will be conducted within the Laurentian Mixed Forest ecological province throughout the active foraging period and across habitat types to maximize the documented species diversity. Various methods will be used to capture the diversity of bees. Photography will be used where possible to minimize destructive sampling. All voucher specimens collected will be pinned, identified, and entered into a DNR database with associated habitat information. A taxonomist will confirm specimen identification. Specimens will be accessioned into the University of Minnesota Insect Collection and data included in the collections database.

ACTIVITY 1 ENRTF BUDGET: \$558,849

Outcome	Completion Date
1. Field surveys of wild bees and associated plant species at up to 75 sites in the LMF	June 2022
2. Specimen preparation, identification, data entry, and deposition into the Insect Collection	June 2022

First Update March 1, 2020

Second Update September 1, 2020

Third Update March 1, 2021

Fourth Update September 1, 2021

Fifth Update March 1, 2022

Final Report between project end (June 30) and August 15, 2022

Activity 2 Title: Wild bee education and outreach

Description: Continue to develop summary documents on wild bees, including updates to the state list of bee species and dedicated MNDNR webpages. Wild bee identification and monitoring workshops will be conducted to increase technical expertise using the Upper Midwest Citizen Science Monitoring Guide developed by Xerces Society and funded through ENRTF. Other outreach activities include presentations to schools, non-profit organizations, scientific audiences, and conservation groups.

ACTIVITY 2 ENRTF BUDGET: \$41,151

Outcome	Completion Date
1. Compile data and develop summary products on wild bees	June 2022
2. Coordinate 3 expert-led bee identification workshops for approx. 100 attendees	March 2022
3. Conduct at least 15 public outreach activities	June 2022

IV. DISSEMINATION:

Description:

Data collected from this project will be stored in the Minnesota Department of Natural Resources (MNDNR), Division of Ecological and Water Resources information system. This information will take the form of databases, GIS layers, maps, and web-based summaries. It will be linked to other databases within the MNDNR and will be shared with our partners working on separate bee and pollinator projects. Any records of the federally listed Rusty patched bumble bee will be communicated with the USFWS as per the requirements of the necessary permitting, along with all other bumble bee records. Physical collections of bees will be prepared and deposited into the Insect Collection at the University of Minnesota.

The Minnesota Environment and Natural Resources Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the [ENRTF Acknowledgement Guidelines](#).

First Update March 1, 2020

Second Update September 1, 2020

Third Update March 1, 2021

Fourth Update September 1, 2021

Fifth Update March 1, 2022

Final Report between project end (June 30) and August 15, 2022

V. ADDITIONAL BUDGET INFORMATION:

A. Personnel and Capital Expenditures

Explanation of Capital Expenditures Greater Than \$5,000: N/A

Explanation of Use of Classified Staff: N/A

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

Enter Total Estimated Personnel Hours for entire duration of project: 13,104	Divide total personnel hours by 2,080 hours in 1 yr = TOTAL FTE: 6.3
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Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:

Enter Total Estimated Contract Personnel Hours for entire duration of project: ~500	Divide total contract hours by 2,080 hours in 1 yr = TOTAL FTE: 0.24
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VI. PROJECT PARTNERS:

A. Partners outside of project manager's organization receiving ENRTF funding

We will contract with the Xerces Society, Senior Pollinator Conservation Specialist, Sarah Foltz Jordan to deliver three citizen science bee identification and monitoring workshops (one workshop per year). Xerces Society will supply materials for all participants (up to 90 people over the 3-year project) and the Minnesota DNR will manage registration for these events.

B. Partners outside of project manager's organization NOT receiving ENRTF funding

We will partner with the University of Minnesota Insect Collection Director (Dr. Ralph Holzenthal) and Curator (Dr. Robin Thomson) to accession and permanently curate insect specimens in the collection. Likewise, we will consult with Dr. Dan Cariveau of the University of Minnesota Bee Lab on sampling techniques, data sharing, and taxonomic consultation.

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

This timeframe will produce results that can stand alone or act as the beginning phase of a long-term monitoring program. Alone, this project's duration is insufficient to account for yearly fluctuations of insect populations, but can serve as a foundation on which to build such a data set. Expansion of surveys into the Laurentian Mixed Forest will add to our knowledge of wild bee fauna in a new ecological setting.

VIII. REPORTING REQUIREMENTS:

- Project status update reports will be submitted March 1 and September 1 each year of the project
- A final report and associated products will be submitted between June 30 and August 15, 2022

IX. SEE ADDITIONAL WORK PLAN COMPONENTS:

- A. Budget Spreadsheet**
- B. Visual Component or Map**
- C. Parcel List Spreadsheet**
- D. Acquisition, Easements, and Restoration Requirements**
- E. Research Addendum**

Attachment A: Project Budget Spreadsheet
Environment and Natural Resources Trust Fund
M.L. 2020 Budget Spreadsheet



Legal Citation:

Project Manager: Jessica Petersen

Project Title: Native Bee Survey

Organization: MN DNR

Project Budget: \$600,000

Project Length and Completion Date: 3 years, June 30th, 2023

Today's Date: 6/5/2019

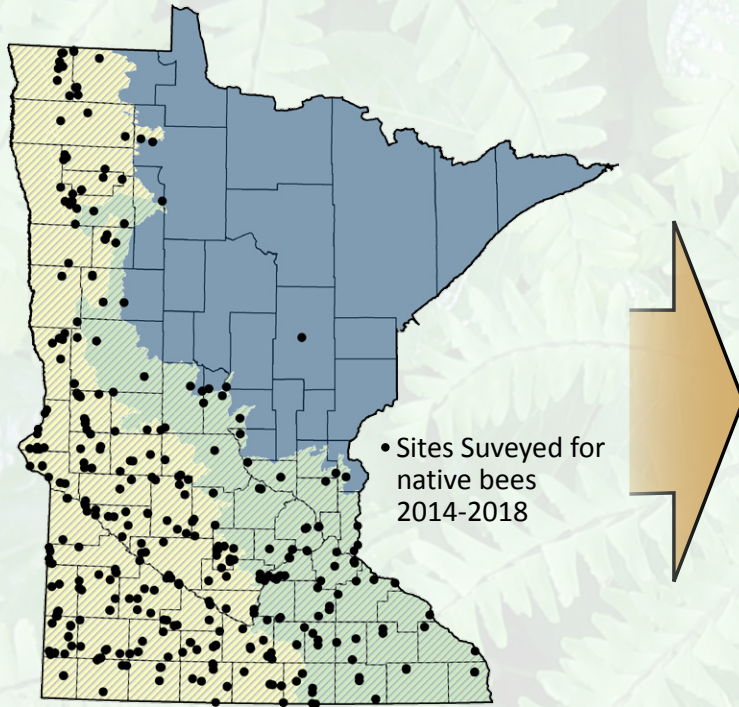
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
BUDGET ITEM				
Personnel (Wages and Benefits)		\$ 447,708	\$ -	\$ 447,708
Entomologist Research Scientist/Project Lead, \$85,000 (65%salary 35%benefits), 0.25FTE each year for 3 of 3 years				
Entomologist Natural Resource Specialist/Field Lead, \$190,000 (70% salary 30% benefits), 1.0 FTE each year for 3 of 3 years (70% salary/30% benefits)				
Bee Survey Assistants, \$158,208 (72% salary 28% benefits), 0.8 FTE each year for 3 of 3 years				
Zoology Data Manager, \$6,500 (73% salary 27% benefits), 0.025 FTE each year for 3 of 3 years				
Information Outreach Specialist \$8,000 (64% salary/36% benefits) 0.025 FTE each year for 3 of 3 years				
Professional/Technical/Service Contracts				
DNR non-competative sole-source contract with Xerces Society for up to 3 bee identification workshops that they are uniquely qualified to deliver.		\$ 10,000	\$ -	\$ 10,000
Contracts with UMN per DNR-UMN Master Contract for entomological technical services.		\$ 10,000	\$ -	\$ 10,000
Equipment/Tools/Supplies				
Field equipment and supplies to conduct bee surveys (GPS units, maps, data recorders, cameras, traps, nets, collecting containers, first-aid equipment)		\$ 7,000	\$ -	\$ 7,000
Specimen preparation and storage supplies (pins, pinning boards, specimen drier, drawers, boxes, unit trays)		\$ 8,000	\$ -	\$ 8,000
Travel expenses in Minnesota				
Travel to conduct bee surveys, ~260 field days, ~40,000 miles. Vehicles, lodging, and meals in accordance with the Commissioner's Plan.		\$ 75,000	\$ -	\$ 75,000
Other				
Direct and necessary costs to cover HR support (~\$9,530), Safety Support (~\$1,974), Financial Support (~\$6,895), Communication Support (~\$1,251), IT Support (~\$21,583), and Planning Support (~\$1,059).		\$ 42,292	\$ -	\$ 42,292
COLUMN TOTAL		\$ 600,000	\$ -	\$ 600,000
OTHER FUNDS CONTRIBUTED TO THE PROJECT				
	Status (secured or pending)	Budget	Spent	Balance
Non-State:	N/A	\$ -	\$ -	\$ -
State:				
General Fund for program zoologist project supervision, oversight, guidance.	Pending	\$ 40,000	\$ -	\$ 40,000
In kind:	N/A	\$ -	\$ -	\$ -
PAST AND CURRENT ENRTF APPROPRIATIONS				
	Amount legally obligated but not yet spent	Budget	Spent	Balance
M.L. 2014 Chap. 226 Sec. 2 Subd. 05i Wild Bee Pollinator Surveys in Prairie-Grassland Habitats		\$ 370,000	\$ 370,000	\$ -
M.L. 2016 Chap. 186 Sec. 2 Subd. 03b Native Bee Surveys in Minnesota Prairie and Forest Habitats		\$ 600,000	\$ 588,000	\$ 12,000



The Minnesota Biological Survey has documented 7 individuals of Yellow-banded bumble bee (*Bombus terricola*). Surveys in the Laurentian Mixed- Forest could add more records of this vulnerable species to better understand its conservation status.

Need: The wild bee diversity is largely unknown from 43% of Minnesota

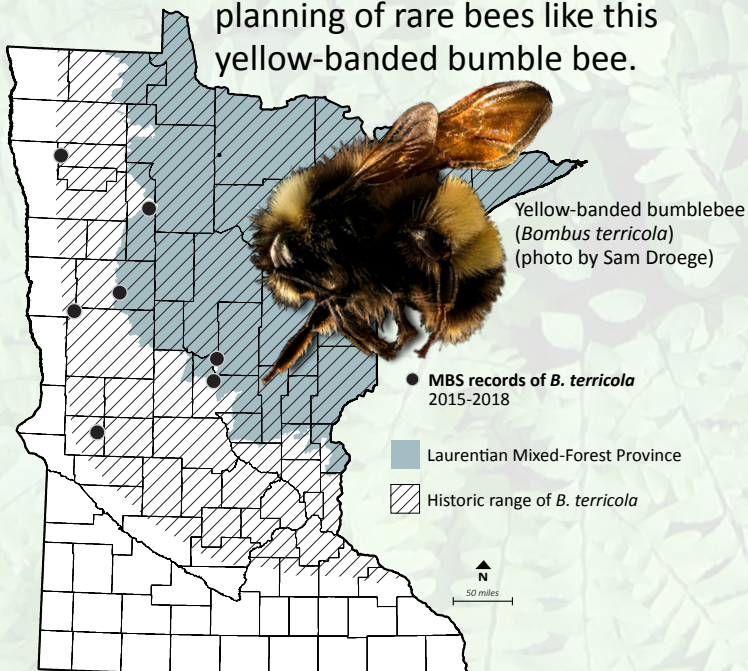
Solution: Survey 75 forested habitats in the Laurentian Mixed Forest province.



Outcomes

More informed conservation planning of rare bees like this yellow-banded bumble bee.

Baseline data to monitor changes in bee diversity through time.



Bee Trends Through Time

