Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2015 Work Plan

Date of Report: November 3, 2014

Date of Next Status Update Report: January 1, 2016

Date of Work Plan Approval:

Project Completion Date: June 30, 2019

Does this submission include an amendment request? __

PROJECT TITLE: Minnesota Native Bee Atlas

Project Manager: Robert B. Blair

Organization: University of Minnesota

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Location: Statewide.

Total ENRTF Project Budget:		
	ENRTF Appropriation:	**$790,000**
	Amount Spent:	**$0**
	Balance:	**$790,000**

Legal Citation: M.L. 2015, Chp. 76, Sec. 2, Subd. 03g

Appropriation Language:
$790,000 the first year is from the trust fund to the Board of Regents of the University of Minnesota to supplement and enhance existing bee survey efforts by engaging citizens in helping to document the distribution and phenology of wild Minnesota bees and integrating data from all related bee survey efforts into a single publicly accessible, online tool and repository. This appropriation is available until June 30, 2019, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Minnesota Native Bee Atlas

II. PROJECT STATEMENT:
The Minnesota Native Bee Atlas will engage citizens in documenting the distribution and phenology of native Minnesota bees. It will complement (not duplicate) other, on-going, pollinator surveys by sampling tunnel-nesting and bumble bees in all of the ecological provinces, sections, and subsections of the state. It will also integrate bee distribution data from several other sources to create a publically accessible, user friendly database on all bee distributions in the state.

Need. Wild bees are a vital part of our state's ecosystems. However, we know very little about their distribution, abundance, and seasonal activity. The only statewide checklist of Minnesota bees was published in 1919 and contained 88 species, far fewer than the approximately 400 species that are suspected of living here. Additionally, little is published about the phenology of individual bee species: when they become active after winter, when they lay eggs, and when the adults emerge. The Minnesota Wild Bee Atlas will document the distributions throughout the state of tunnel-nesting bees, which comprise ~30% of Minnesota's bee species. Their nesting habits allow the use of standardized nesting blocks, which trained citizen scientists can easily deploy. The project also focuses on bumble bees because of the straightforward visual identification of most Minnesota bumble bees and their high public interest.

This project will complement and build upon two LCCMR-funded projects that are documenting bee distributions in Minnesota and one that is recommended for funding. "Wild Bee Pollinator Surveys in Prairie-Grassland Habitats", managed by Gerda Nordquist MN-DNR, will intensively sample wild bees in up to 90 random sites in the prairie portions of the state. "Enhancing Pollinator Landscapes", managed by Marla Spivak UMN, will intensively survey three areas in southeastern Minnesota to compare historic records to current ones. "Effects of Grazing Versus Fire for Prairie Management" managed by Karen Oberhauser is a project recommended for funding that will study the effects of grazing and fire on tallgrass prairie plants and pollinators in 75 prairie sites in Minnesota. Though the focus of this project is not bee distributions, the data collected on bee distributions will be archived in the Minnesota Wild Bee Atlas.

All of these projects address one facet of bee distributions in the state but none has a statewide geographic focus and most of the sites that will be sampled are located in the western third of the state that was formerly dominated by tallgrass prairie. The "Minnesota Wild Bee Atlas" will expand the geographic focus of wild bee surveys to all portions of the state, but concentrate on the tunnel-nesting and bumble bees because of the involvement of trained, but not expert, citizen scientists.

Using citizen scientists will add the extensive sampling power of citizen science to other survey efforts by enabling much broader geographic coverage. It will involve hundreds of volunteer citizen scientists systematically documenting wild bee distributions and phenology at hundreds of sites throughout the state. It will also make the data of all three projects easily accessible to researchers and the public through its digital portal.

Goals and Outcomes. The goal of Minnesota Wild Bee Atlas is to promote the conservation of Minnesota native pollinators. The direct outcomes of the project are to:
1) determine the distribution of tunnel-nesting and bumble bees throughout Minnesota;
2) document the phenology of these bees to aid in their management and conservation;
3) promote an understanding of native bees among Minnesota citizens by engaging them in documenting bee distribution and phenology; and
4) combine this information with that from other LCCMR-funded pollinator surveys in a digital atlas to make this information widely available to researchers and the public.

Process. The project will occur in three steps:

1) The first step in building the Minnesota Native Bee Atlas will be to refine existing sampling protocols for use in Minnesota, create a comprehensive web site and database that will be used to enter and retrieve data, and develop training materials and workshops for the citizen scientists who will be collecting the data.
2) The second step will be to train citizen scientists to survey bees across the state. The project will have three tiers of sampling and rigor: incidental observation of all bees, targeted observation of bumble bees, and systematic sampling of tunnel-nesting bees. Casual participants will be able to report bees that they encounter outdoors. Those who are more passionate will be able to adopt specific sampling locations and either conduct targeted observation of bumble bees or deploy wood nesting blocks to sample tunnel-nesting bees.
3) The third, and final, step will be to cross-validate the data submitted by the citizen-scientists and to make them available in a database that can be queried by the citizen scientists, researchers, and the general public.

Significance. The project will 1) provide the first ***systematic statewide assessment*** of the distribution of tunnel-nesting and bumble bees; 2) provide ***phenologies for individual bee species***, which can guide management practices such as timing of herbicide use, prescribed burns, mowing, and other management actions; 3) develop a ***statewide cohort of citizen scientists*** that is knowledgeable about native bees; and 4) link with the Global Biodiversity Information Facility (www.gbif.org), an international clearinghouse on biodiversity data. The long-term strategy for the project is to provide data that will aid in the conservation of Minnesota's wild bees.

III. OVERALL PROJECT STATUS UPDATES:

Project Status as of January 1, 2016:

Project Status as of July 1, 2016:

Project Status as of January 1, 2017:

Project Status as of July 1, 2017:

Project Status as of January 1, 2018:

Project Status as of July 1, 2018:

Project Status as of January 1, 2019:

Overall Project Outcomes and Results:

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Develop citizen science sampling protocols, training, and digital database.
Description: Activity 1 will occur from July 2015 through January 2016; the first seven months of the project.

The sampling protocol for tunnel-nesting bees will be based on citizen-science projects in Florida (UFL's Native Buzz) and Colorado (UC's The Bees' Needs). The University of Florida's Native Buzz was initiated in 2012. They offer web-based resources on how to build tunnel nests and how to identify tunnel-nesting bees. They do not offer in-person training nor guide participants to sampling locations. The University of Colorado's Bees Needs provides standardized sampling blocks and requests that participants sample bees in their backyards. Both programs have web-based data submission. The Minnesota Wild Bee Atlas will use the knowledge gained in developing these programs to create a consistent bee sampling protocol that is appropriate for Minnesota but will direct participants to sample specific locations throughout the state. The training materials that we develop for in-person training will be derived from the materials developed by these programs.

The sampling protocol for bumble bees will be based on the Twin Cities-based Bumble Bee Survey. Elaine Evans, a doctoral candidate at the University of Minnesota and a member of the Minnesota Wild Bee Atlas team, has developed and implemented this survey in 2011. This project and Elaine were influential in developing the recently debuted Xerces Society Bumble Bee Watch, which is an effort to involve citizen scientists in mapping the distribution of bumble bees across North America.

In addition to strategic sampling of the tunnel-nesting and bumble bees in Minnesota, we will also allow citizen scientists to report when they encounter any bee species. The reporting of incidental observation of all bee species will follow the protocols of the National Biological Information Infrastructure's (NBII) DiscoverLife.

Once the sampling protocols are established, we will develop training manuals and training workshops for participants. These workshops will be 6 – 8 hours long, cover the basics of bee biology, and appropriate bee sampling protocols. The format will be based on that used by the Minnesota Master Naturalist program for informal adult science education. All manuals will be peer reviewed by national experts in bee biology and adult science education.

The Atlas' website and database will be adapted from the Monarch Larva Monitoring Project. The website will allow citizen scientists to adopt areas (blocks) across Minnesota in which they will survey the tunnel-nesting and bumble bees and then enter their site-specific data. It will also allow citizen scientists to report and upload photographs of observations of all bee species for verification. The website will be vital in training participants, providing resources for interested citizens, and managing the data gathered by the citizens.

The database function of the web site will be important in sharing the data broadly with the citizens that participate in the program, the public, and researchers. In developing the database, we coordinate with National Biological Information Infrastructure's (NBII) DiscoverLife the Global Biodiversity Information Facility (www.gbif.org) programs to insure that records are shared accurately and without duplication of specimen records. Additionally, we will coordinate with the Bell Museum-based project "Integrating Minnesota's Biodiversity Data: a Comprehensive, Dynamic Atlas" which was recommended for funding by the LCCMR. This project does not include information on insects as they are outside of the current purview of the Bell Museum.

Summary Budget Information for Activity 1:

ENRTF Budget: $ 95,231
Amount Spent: $ 0
Balance: $ 95,231

Outcome	Completion Date
1. Develop tunnel-nesting, bumble, & observed bee survey protocols & training materials.	1/1/16
2. Develop website to support recruitment, training, data submission, and quality review	1/1/16

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Activity Status as of January 1, 2017:

Activity Status as of July 1, 2017:

Activity Status as of January 1, 2018:

Activity Status as of July 1, 2018:

Activity Status as of January 1, 2019:

Final Report Summary:

ACTIVITY 2: Train citizen scientists and conduct survey of native bee fauna.
Description: Activity 2 will occur between January of 2016 and October of 2018; roughly the middle three years of the project.

Citizen scientists will be recruited and trained through both online and in-person methods. We expect that many volunteers will be Minnesota Master Naturalists, Master Gardeners, participants in the LCCMR-funded Breeding Bird Atlas, and regular DNR volunteers. We will also broaden participation to youth groups and their leaders.

The in-person training will involve 25 one-day training sessions offered across the state – tentatively in the Twin Cities, Morris, Crookston, Lamberton, Duluth, Rochester, and Bemidji – with projected average attendance of 30 individuals. The majority of these training events will occur between January and June of 2016, with additional trainings occurring through June of 2017.

Sampling for the project will start in May of 2016. Each participant will deploy three tunnel-nesting blocks in a county determined in conjunction with program staff and at locations in specific habitat types expected to gain the widest diversity of bees within the region. At the end of the sampling season in October, participants will mail a subsample of the bees and blocks for verification of species identification to the University of Minnesota's bee lab. The participants will deploy blocks in the same locations again for the summer if 2017 and 2018 because bee populations are cyclical and adequate sampling typically requires three years of effort at a single site. However, to encourage wider participation and because of attrition that occurs in long-term citizen science projects, we will allow some participants to join the program in 2017 and conduct two years of sampling.

Finally, we will also coordinate training and sampling with "Driven to Discover: Citizen Science Inspires Classroom Investigation" which is a project to train classroom teachers to use citizen science projects in their educational efforts. This project, headed by MN Wild Bee Atlas members Karen Oberhauser and Rob Blair, was recently funded by the National Science Foundation. Coordination with this project will allow the to reach Minneosta;'s science educators and youth.

Summary Budget Information for Activity 2:

ENRTF Budget: $ 507,789
Amount Spent: $ 0
Balance: $ 507,789

Outcome	Completion Date
1. Recruit and train ~750 citizen scientists for all three tiers of bee survey protocols.	6/1/17
2. Deploy ~250 citizen scientists with appropriate materials to conduct surveys of tunneling bees at sites across the state that they have adopted for 3 annual cycles. ~ 250 will similarly survey bumble bees at adopted sites. ~250 will conduct incidental observations of all bees.	10/31/18
3. Monitor incoming data, identify sources of reporting error, refine training and website.	10/31/18

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Activity Status as of January 1, 2017:

Activity Status as of July 1, 2017:

Activity Status as of January 1, 2018:

Activity Status as of July 1, 2018:

Activity Status as of January 1, 2019:

Final Report Summary:

ACTIVITY 3: Validate data, combine with other surveys, and create digital atlas.
Description: Activity 3 will occur concurrently with Activity 2 (1/2016 to 10/2018) with an additional eight months to process the data, finalize the atlas, and complete the project (11/2018 to 6/2019).

To ensure validity and usefulness of the data, the staff entomologist will collect subsamples of nesting blocks and raise larvae for identification. This will involve volunteers mailing subsamples of the nesting blocks at the end of each nesting season to UMN, raising the larvae through the spring of the next year, and identifying the adults that emerge.

We will combine all data from this project with that generated by the LCCMR-sponsored projects: "Wild Bee Pollinator Surveys in Prairie-Grassland Habitat"; "Enhancing Pollinator Landscapes", and "Effects of Grazing Versus Fire for Prairie Management" so that citizen scientists, researchers, and the general public can explore the distributions of Minnesota's bees. This data will be shared with appropriate state, national, and international biodiversity databases (see details above). The final atlas will be both a site where researchers can research the occurrence and phenology of wild bees in Minnesota, as well as an educational resource for citizens who want to know more about Minnesota's wild bees.

Summary Budget Information for Activity 3:

ENRTF Budget: $ 186,980
Amount Spent: $ 0
Balance: $ 186,980

Outcome	Completion Date
1. Collect samples of 250 bee-nesting blocks per year for three years (subsamples each year from the 3 blocks allotted to each citizen scientist), hatch larvae, identify bees.	10/30/18
2. Apply quality control measures to subsamples to cross-validate data.	4/31/19
3. Supplement website to make all known bee data from multiple surveys available through online query to researchers and public.	6/31/19

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Activity Status as of January 1, 2017:

Activity Status as of July 1, 2017:

Activity Status as of January 1, 2018:

Activity Status as of July 1, 2018:

Activity Status as of January 1, 2019:

Final Report Summary:

V. DISSEMINATION:
Description: Dissemination of information developed during the project will occur through three major outlets: 1) print and web materials developed to train the citizen scientists in face-to-face workshops, 2) print and web materials for citizen scientists who want to participate by providing casual (non-systematic) observations of bees, and 3) a web-based interface to the database on bee distributions and their phenologies, which is the final outcome of the project. The digital portal for the Minnesota Wild Bee Atlas will contain data from this project as well as two other LCCMR pollinator distribution projects. It will be linked to the National Biological Information Infrastructure's (NBII) DiscoverLife database as well with the Global Biodiversity Information Facility (www.gbif.org), an international clearinghouse on biodiversity data. The portal and database will be permanently housed by the Bell Museum of Natural History.

Activity Status as of January 1, 2016:

Activity Status as of July 1, 2016:

Activity Status as of January 1, 2017:

Activity Status as of July 1, 2017:

Activity Status as of January 1, 2018:

Activity Status as of July 1, 2018:

Activity Status as of January 1, 2019:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:
A. ENRTF Budget Overview:

Budget Category	$ Amount	Overview Explanation
Personnel:	$588,625	•Robert Blair, Project Director (75% salary, 25% benefits); 8.3% FTE for 4 years •Karen Oberhauser, Training and Database Construction (75% salary, 25% benefits); 8.3% FTE for 4 years •Kevin Williams, Volunteer Training (75% salary, 25% benefits); 12.5% FTE for 4 years •Elaine Evans, Bumble Bee Survey Coordinator (81% salary, 29% benefits); 16.6% FTE for 4 years •Joel Gardner, Entomologist and Database Manager (83% salary, 17% benefits); 100% FTE for 4 years •Project Coordinator (75% salary, 25% benefits); 100% FTE for 4 years
Professional/Technical/Service Contracts:	$91,000	•Witty Design to build website and database in Year 1 ($25,000), to refine in Years 2&3

		($10,000/yr), to expand Year 4 ($20,000) (Witty Design is the desired contractor as they will adapt the existing Monarch Larvae Monitoring Project web site which they developed and manage. Witty design was competitively selected for the original MLMP web site.) •Graphic design of educational materials (instruction handbooks, web site, recruiting/informational brochures). (To be determined by competitive bid.)
Equipment/Tools/Supplies:	$37,875	•2500 Bee nesting blocks -- 3 per each of 250 initial volunteers so that volunteers may deploy nesting blocks at three locations in the first year of sampling (750 Total), 1500 additional for replacements so that these volunteers may replace the initial blocks and send them to St Paul for verification of identifications annually for two additional years, plus 250 for broader distribution to the interested public who wish to join the program after the initial year. •Postage to ship nesting blocks (Necessary for initial distribution and for validation, $12.35 per box of 2) •Boxes for Shipping
Printing:	$17,500	• Educational materials (1000 handbooks, 3000 brochures, signage)
Travel Expenses in MN:	$28,000	•$18,000 for travel for 3 staff members to offer 25 one-day training sessions in Twin Cities, Morris, Crookston, Lamberton, Duluth, Rochester, and Bemidji. Each workshop will take 3 days and 2 nights of staff time. Each workshop is budgeted at an average of 200 miles of travel at $0.55 per mile, 2 hotel rooms for 2 nights at $83 per room per night, and two days of food per diem per staff person at $46 per person per day (6 person-days total). •$10,000 for travel for staff entomologist. $2,500 is budgeted for each year of the project to check placement of traps and to cross-validate identifications in the field.
Other:	$27,000	•$15,000 in workshop Materials ($20 per volunteer trained in 25 workshops with expected attendance of 30 per workshop). Includes Xerces Society bee identification guide ($17) and hand lens ($2) for each participant. Also general workshop delivery materials including items such as post its, markers, and easel paper. •$12,000 in cloud storage for database. Budgeted at $2,500 per year.

TOTAL ENRTF BUDGET:	$790,000	

Explanation of Use of Classified Staff: N/A

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

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 9.8

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 1.0

B. Other Funds:

Source of Funds	$ Amount Proposed	$ Amount Spent	Use of Other Funds
Non-state			
University of Minnesota	$17,748	$	Rob Blair 4% FTE per yr
University of Minnesota	$4,790		Karen Oberhauser 1% FTE per yr
Citizen Scientists	$300,000		Collective volunteer effort.
State			
DNR	$8,148	$	Megan Benage 60 hrs per year for 4 years
TOTAL OTHER FUNDS:	**$330,686**	**$**	

VII. PROJECT STRATEGY:

A. Project Partners: This project is a collaboration of entities with strengths in bee sampling and surveys (**UMN Bee Lab, MNDNR**); citizen science (**Monarch Larva Monitoring Project**); volunteer recruitment and training (**Minnesota Master Naturalist**); outreach (**UMN Extension, Bell Museum**), and natural history data management (**Bell Museum, MNDNR**).

This project will be managed by University of Minnesota Extension and formally housed in the Bell Museum of Natural History. Volunteers will be recruited heavily from the Minnesota Master Naturalist Program as well as other insect-oriented citizen groups. Technical support will be from Dr. Marla Spivak's Bee Lab. We will coordinate efforts and share data with the DNR and the LCCMR-funded *Wild Bee Pollinator Surveys in Prairie-Grassland Habitats* managed by Gerda Nordquist and the survey portions of the resampling efforts of the LCCMR-funded *Enhancing Pollinator Landscapes* managed by Dr. Marla Spivak.

B. Project Impact and Long-term Strategy:

This project will use citizen science to 1) determine the distribution of tunnel-nesting and bumble- bees *throughout* Minnesota, 2) document the *phenology* of these bees to aid in their management and conservation; 3) promote an understanding of native bees among Minnesota citizens by engaging them in research on wild bees, and 4) combine this information with data from other LCCMR-funded pollinator surveys to make this information in a *digital atlas* widely available to researchers, land managers, and the public. The final product is the atlas. The project will sunset at the end of the grant period. The completed digital atlas will become part of the collections of the Bell Museum of Natural History.

C. Funding History: N/A

VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS:

A. Parcel List: N/A

B. Acquisition/Restoration Information: N/A

IX. VISUAL COMPONENT

Creating the Minnesota Native Bee Atlas

Step 1 Train Citizen Scientists in Three Bee Survey Protocols

All Bees

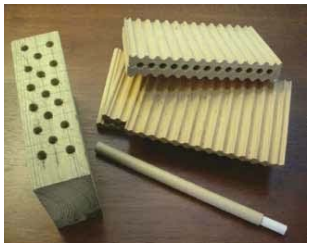
Bumble Bees

Tunnel-Nesting Bees

Step 2 Implement Three Protocols for Three Years

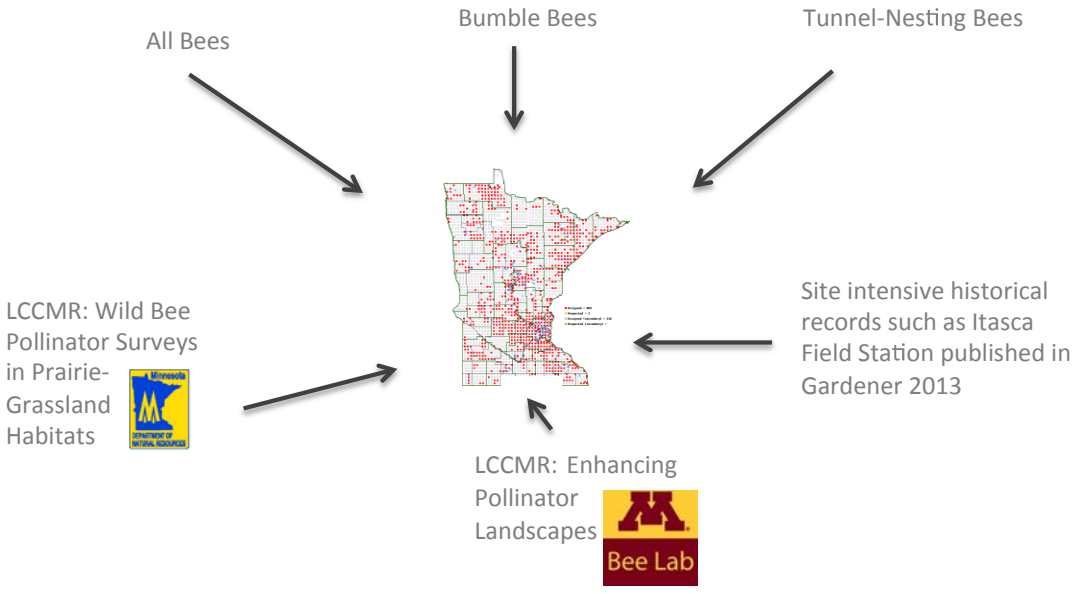
Casual Observation of All Bees

Structured Observation of Bumblebees



Stratified Sampling using Bee Blocks

Step 3 Build Digital Atlas with Data from Multiple Sources



X. RESEARCH ADDENDUM: N/A

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than July 1, 2016, January 1, 2017, July 1, 2017, January 1, 2018, July 1, 2018, and January 1, 2019. A final report and associated products will be submitted between June 30 and August 15, 2019.

Environment and Natural Resources Trust Fund
M.L. 2015 Project Budget

Project Title: Minnesota Native Bee Atlas
Legal Citation: M.L. 2015, Chp. 76, Sec. 2, Subd. 03g
Project Manager: Robert B. Blair
Organization: University of Minnesota
M.L. 2015 ENRTF Appropriation: $790,000
Project Length and Completion Date: 4 Years, June 30, 2019
Date of Report: 10/15/2014

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	Activity 3 Budget	Amount Spent	Activity 3 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	**Develop citizen science sampling protocols, training, and digital database.**			**Train citizen scientists and conduct survey of native bee fauna.**			***Validate data, combine with other surveys, and create digital atlas.***				
Personnel (Wages and Benefits) Overall	$70,231	$0	$70,231	$363,914	$0	$363,914	$154,480	$0	$154,480	$588,625	$588,625
Robert Blair, Project Director (75% salary, 25% benefits); 8.3% FTE for 4 years. Estimated Total $52,719											
Karen Oberhauser, Training and Database Construction (75% salary, 25% benefits); 8.3% FTE for 4 years. Estimated Total $55,902											
Kevin Williams, Volunteer Training (75% salary, 25% benefits); 12.5% FTE for 4 years. Estimated Total $44,477											
Elaine Evans, Bumble Bee Survey Coordinator (81% salary, 29% benefits); 16.6% FTE for 4 years. Estimated Total $16,637											
Joel Gardner, Entomologist and Database Manager (83% salary, 17% benefits); 100% FTE for 4 years. Estimated Total $167,743											
Project Coordinator (75% salary, 25% benefits); 100% FTE for 4 years. Estimated Total $252,084											
Professional/Technical/Service Contracts											
Witty Design to adapt Monarch Larva Monitoring Project website and database in Year 1 ($25,000), to refine in Years 2&3 ($10,000/yr), to expand Year 4 ($20,000). Witty Design was competitively selected to build the original MLMP website and database.	$25,000	$0	$25,000	$20,000	$0	$20,000	$20,000	$0	$20,000	$65,000	$65,000
Graphic design of educational materials (instruction handbooks, web site, recruiting/informational brochures).				$23,000	$0	$23,000	$3,000	$0	$3,000	$26,000	$26,000
Equipment/Tools/Supplies											
2500 Bee nesting blocks -- 3 per each of 250 initial volunteers (750 initially) so that volunteers may deploy nesting blocks at three locations in the first year of sampling, replacements for two additional years (1500 for replacements), plus 250 for broader distribution to the interested public who wish to join the program after the initial year.				$22,500	$0	$22,500				$22,500	$22,500

Postage to ship nesting blocks (Necessary for initial distribution and for validation, $12.35 per box of 2)				$14,000	$0	$14,000				$14,000	$14,000
Boxes for Shipping				$1,375	$0	$1,375				$1,375	$1,375
Printing											
Educational materials (1000 handbooks, 3000 brochures, signage)				$15,000	$0	$15,000	$2,500	$0	$2,500	$17,500	$17,500
Travel expenses in Minnesota											
Travel for 3 staff members to offer 25 one-day training sessions in Twin Cities, Morris, Crookston, Lamberton, Duluth, Rochester, and Bemidji. Each takes 3 days and 2 nights of staff time.Budgetd at 200 miles of travel at $0.55 per mile, 2 hotel rooms for 2 nights at $83 per room per night, andsix person-days of food per diem at $46 per person per day.				$18,000	$0	$18,000				$18,000	$18,000
Travel for entomologist to check field placement and cross validate traps. $2500 per year of project budgeted.				$7,500	$0	$7,500	$2,500	$0	$2,500	$10,000	$10,000
Other											
Workshop Materials ($20 per volunteer trained in 25 workshops with expected attendance of 30 per workshop). Includes Xerces Society bee identification guide ($17) and hand lens($2) for each participant. Also general workshop delivery materials including items such as post its, markers,and easel paper.				$15,000	$0	$15,000				$15,000	$15,000
Cloud storage for database				$7,500	$0	$7,500	$4,500	$0	$4,500	$12,000	$12,000
COLUMN TOTAL	**$95,231**	**$0**	**$95,231**	**$507,789**	**$0**	**$507,789**	**$186,980**	**$0**	**$186,980**	**$790,000**	**$790,000**