

[2014] Project Abstract

For the Period Ending June 30, 2016

PROJECT TITLE: Pollination Education Center at the Minnesota Landscape Arboretum

PROJECT MANAGER: Peter C. Moe

AFFILIATION: Minnesota Landscape Arboretum

MAILING ADDRESS: 3675 Arboretum Drive

CITY/STATE/ZIP: Chaska Minnesota 55318

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WEBSITE: www.arboretum.umn.edu

FUNDING SOURCE: Environment and Natural Resources Trust Fund

LEGAL CITATION: L. 2014, Chp. 226, Sec. 2, Subd. 09f

APPROPRIATION AMOUNT: \$615,000

Overall Project Outcomes and Results

It is well-known that pollinators are suffering due to loss of habitat, diminished diversity of native vegetation, and upticks in disease. The Minnesota Landscape Arboretum is in a unique position to introduce the public to the plight facing our pollinators what they can do to help. Last year the Arboretum hosted 462,000 visitors including 28,000 school children on field trips. Now all of these visitors will have an opportunity to learn the basics of pollinator science at the **Pollination Education Center** – through both formal and informal education. In collaboration with University of Minnesota researchers Dr. Marla Spivak and Dr. Karen Oberhauser, the Arboretum has created highly engaging exhibits that will encourage visitors to explore:

- The intricate relationships between flowers and their pollinators,
- The critical role of pollination in plant reproduction and in maintaining species diversity,
- How pollination is vitally important for many food crops,
- Creating pollinator-friendly landscapes in urban and rural settings, by helping to preserve and restore diversity and health of native habitats.

On the grounds surrounding the Pollination Education Center, the Garden for Pollinators introduces visitors to plants that are valuable for use in pollinator-friendly landscaping. Interpretive signage provides tips on planting for pollinators, observing pollinators, and offers citizen science opportunities and plant labels provide visitors with specific information on the plant species that they can use in their gardens. Zones in the garden for pollinators include:

- **Butterfly Zone** – Demonstrates perennials, with sturdy clusters of flowers preferred by butterflies and caterpillars.
- **Compare Zone** – Allows for comparison of native species vs. cultivars and their benefit to pollinators.
- **Bee Lawn** – Planted with dutch clover, ground plum, and coreopsis as an example of a pollinator friendly lawn for low-traffic areas.
- **Wild Bee Habitat** – An example of nesting habitat for native bees.



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2014 Work Plan Final Report

Date of Report: August 15, 2016
Final Report
Date of Work Plan Approval: June 4, 2014
Project Completion Date: June 30, 2016

PROJECT TITLE: Pollination Education Center at the Minnesota Landscape Arboretum

Project Manager: Peter C. Moe
Organization: Minnesota Landscape Arboretum
Mailing Address: 3675 Arboretum Drive
City/State/Zip Code: Chaska Minnesota 55318
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Email Address: moexx004@umn.edu
Web Address: www.arboretum.umn.edu

Location: Carver, Statewide

Total ENRTF Project Budget:	ENRTF Appropriation: \$615,000
	Amount Spent: \$612,233
	Balance: \$267

Legal Citation: M.L. 2014, Chp. 226, Sec. 2, Subd. 09f

Appropriation Language:

\$615,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota to develop exhibits for an educational center that will offer hands-on learning experience about the role of pollinators and importance of pollinator habitat. Exhibits must utilize and integrate the best available science pertaining to all pollinator types, particularly native species. Approval of the work plan for this appropriation is contingent upon the organization addressing how it will increase access to the center by youth at no or limited cost.

I. PROJECT TITLE: Pollination Education Center at the Minnesota Landscape Arboretum

II. PROJECT STATEMENT:

WHY. Pollination is the cornerstone that supports the ongoing flow of life through natural ecosystems and our food production system. Yet today pollinators are in trouble. Loss of habitat and native vegetation diversity, systemic pesticide use, advent of Round-up ready agricultural crops and upticks in diseases are contributing to declines in the many species of bees that are our region's primary pollinators, as well as other flower feeders such as native butterflies, flies and beetles. We rely on a vast and often overlooked network of interdependencies between plants and their pollinators for the continued health of our woodlands, wetlands and prairie, as well as for food production. Developing an aware, informed citizenry that understands this issue is a key to finding and implementing solutions.

WHAT. The goal of the "Pollination Education Center at the Minnesota Landscape Arboretum" is to raise the profile of this important issue in our state. We will create a dedicated educational facility with exhibits, demonstration plantings and ongoing programming. All these will support increased public understanding of the issues facing our bee species and other pollinators. The Arboretum has secured funds for the building's construction from other sources. This project will develop the essential messaging that fills its 1600 sq ft exhibit hall and the adjacent garden. Exhibits and displays inside and out will be based on sound ecological principles and current scientific research. Content will be reviewed by leading University scientists. Topics will include the intricate relationships between flowers and their pollinators, the critical role of pollination in plant reproduction and in maintaining species diversity, its importance for many food crops, and ways people can help pollinators - by creating pollinator-friendly landscapes in urban and rural settings, by helping to preserve and restore diversity and health of native habitats. The exhibits indoors and out will utilize "flagship" species such as honeybees and monarch butterflies, which waken strong public interest, show immediate links with our lives, and offer a variety of ways to explore the environmental stresses faced by both these charismatic species and other equally important but less-known pollinators. The potential public actions demonstrated, such as the importance of diverse landscape plantings, will improve conditions for many species of pollinators.

HOW. The approach will be to provide scientifically sound information in ways that awaken interest, wonder and curiosity, setting the stage for viewers to want to continue observing and learning in other times and places. The signage, displays, interactive stations and plantings will be designed to engage and inform both children and adults about pollinators. They will offer a wealth of visual and hands-on approaches to the underlying science concepts, and help visitors see the many ways pollination is important in their own lives and for the wider health of the ecosystem. Both within and without, visitors will discover actions they can take in their own lives on behalf of pollinators. When complete, the new facility's exhibits and gardens will be open to Arboretum visitors. The facility will also house ongoing school and summer fieldtrip programs, classes for adults, drop-in weekend programs for families and public festivals.

Exhibits within the building will include a "portal" introduction to the science of flowers, their pollinators, and what occurs during pollination. They will explore the lifeways, adaptations and ecological role of such pollinators as wild bees and other native insects, and honeybees, including the roles these play in food production. Exhibits and plantings outside the building will reinforce and broaden the story, as visitors observe pollinators of many species at work in the plantings. "Best practice" plant choices and habitat characteristics important for success in creating more pollinator-friendly landscapes across urban and rural settings will be demonstrated.

SIGNIFICANCE. Both within and without, visitors will discover actions they can take in their own lives on behalf of pollinators. When complete, the new facility's exhibits and garden area will welcome Arboretum visitors. The facility will also house ongoing school and summer fieldtrip programs for children, adult classes, free drop-in weekend programs for families and public festivals. Existing scholarship and

partnership programs will provide access to the new facility and its services for under-served audiences including urban schools.

III. PROJECT STATUS UPDATES:

Project Status as of: December 16, 2014

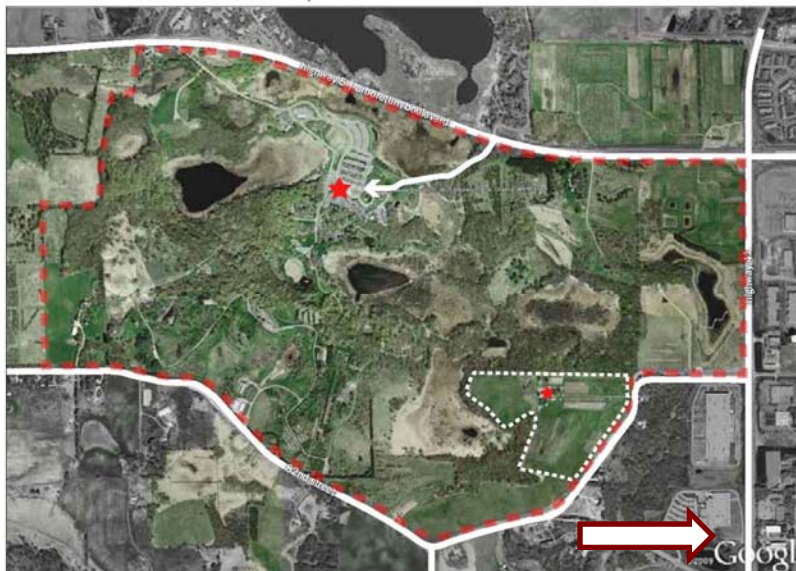
Planning is well underway for the Pollination Education Center at the Minnesota Landscape Arboretum. The University Of Minnesota Board Of Regents reviewed and approved this project at their mid-December meeting, so the Arboretum now has the authorization to move forward with schematic planning, with a projected Summer 2015 groundbreaking for the building.

Activities to this point have included building a new internal road to link the new Campus with the Three Mile Drive, getting costs for bringing utilities to the new Campus, siting the Bee and Pollinator Center and other buildings, and developing a pre-design concept for the facility (the pre-design document from MS&R architects will be made available if LCCMR staff request). It has also included discussions of adjacencies needed within the building, and between the building and its landscape to maximize educational opportunities and minimize operating cost at the Center, and an intensive fundraising effort to ensure the resources necessary to break ground on this important project. The total budget required to break ground on this project is \$6.88 million. Since the Pollination Center is the first building to be constructed on this site, the University Of Minnesota Board Of Regents required the Arboretum to demonstrate that it had raised the necessary resources to support the infrastructure (utilities, roads, water, sewer etc.) before breaking ground.

The Pollination Education Center will be located on the east side of the Minnesota Landscape Arboretum on property that is commonly known for its iconic Red Barn.

- Access to this site is from the recently completed Eastern Drive from within the Arboretum's grounds and 82nd Street.
- The Pollination Education Center includes a projected 6,700 square feet with specialty spaces for central exhibits, teaching/gathering, honey extraction, and greeter stations.
- The associated outside spaces will be the pollinator garden and outdoor exhibitions, and teaching apiary.
- The project will also extend utilities from Highway 41.

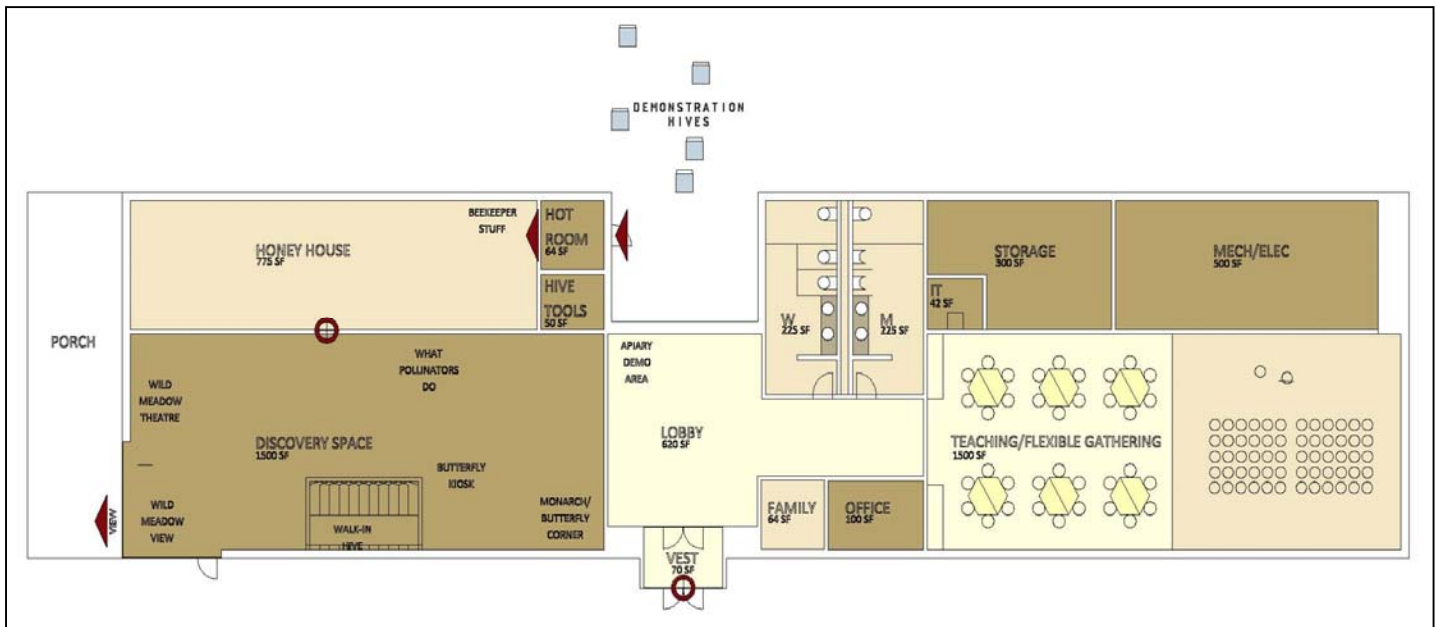
Arboretum Site Location



Project Status as of: June 30, 2015

While the overall project is moving forward, the timeline has shifted due to the University of Minnesota process for approval with the Board of Regents. It now appears that ground breaking on the Pollination Education Center will begin sometime late summer 2015 with an expected completion date in the summer of 2016. Overall progress has been made on the following elements:

- **Schematic Design** for facility completed by Meyer, Scherer & Rockcastle Inc. (MS&R) in mid-April. Review meetings with Arboretum staff, board members and donors, and University of Minnesota scientist collaborators were held. The schematic design packet was submitted to University of Minnesota Boards of Regents for review. This document includes a set of building floor plans, cross-section diagrams and perspectives, location on site and landscape plan.
- **Exhibit Development** firm was selected mid-May. An RFP was issued, an informational meeting was held for interested firms, proposals were reviewed and scored by a panel of staff from University of Minnesota Capital Planning & Project Management (CPPM) and the Arboretum. The top scoring proposal was from a local company – KidZibits (<http://www.kidzibits.com/>). Several debrief sessions were held to update KidZibits staff on current building design and exhibit pre-planning efforts.
- **Exhibits Framework and Concept Development** work with KidZibits has begun and we are meeting weekly through the month of June with the goal being completion of this phase and the creation of a summary report on the design concepts for the exhibits by June 30, 2015. This document will include an exhibition narrative, list of science concepts, floor plan and perspective sketches of several exhibit zones.



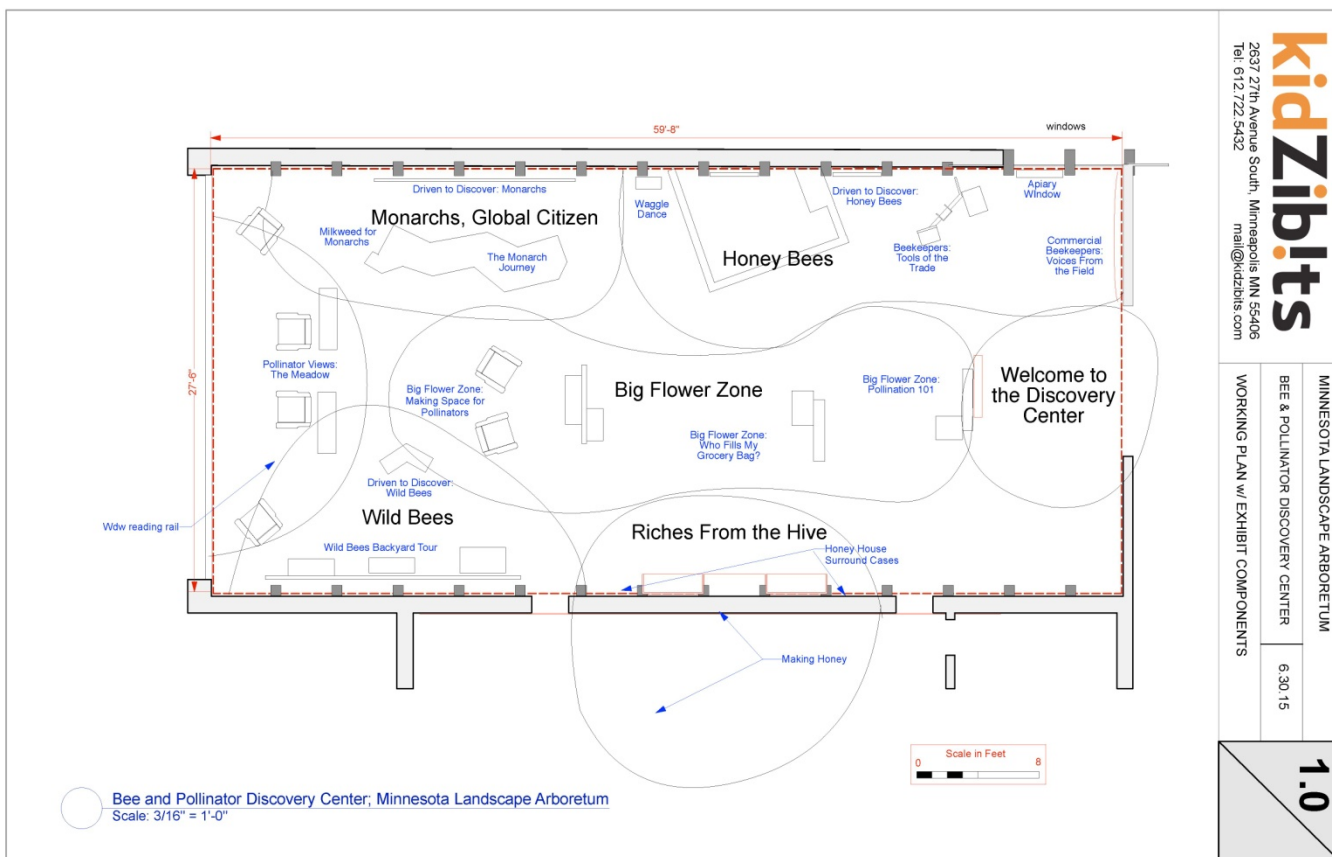
Resources/Time spent on project:

- Arboretum Manager of Interpretation has completed 140 hours of effort on activity I and 20 hours of effort on activity II.
- A total of \$5,000 has been spent on Garden and Design Consulting through a contract with Damon Farber.
- KidZibits has been contracted for \$480,000 to design and fabricate the exhibits and \$12,000 to do the interpretive signage.

Project Status as of: December 15, 2015

Design and construction of the facility, its exhibits and its demonstration gardens began as scheduled in late fall 2015, with a target opening date of Summer 2016. Progress included the following specifics:

- **Facility Construction.** Construction Documents were completed in September. Permits were received and ground was broken for the new facility in late October. Detail planning for plumbing, lighting and other finish details continued as construction of the cement slab began.
- **Exhibits Concept Plan.** The contract was signed with exhibit development firm KidZibits in late May. Creation of the Exhibits Concept Plan was completed by end of June.
- **Exhibits Schematic Design & Design Development.** Work on Exhibits Schematic Design and Design Development for specific zones and features continued through the summer and fall. With the input from a late-stage stakeholder review session in late October, this stage concludes in December.
- **Exhibits Final Design.** Overlapping with the conclusion of Design Development, the first stage of Final Design began with production of draft text scripts for exhibition signage in December. Final Design continues through February, when fabrication will start.



Resources / Time spent on projects:

- Arboretum Manager of Interpretation has completed 720 hours of in-kind effort on Activity I and 42 hours of effort on Activity II.
- A total of \$11,600 has been spent on garden design through a contract with Damon Farber.
- A total of \$49,639 has been spent on exhibit development through a contract with KidZibits. The interpretive signage has not yet been invoiced.

Amendment Request: 06/15/2016:

The Arboretum is requesting to shift funds within categories in order to complete the project in a timely manner. This budget amendment will not impact the deliverables outlined in the workplan. Some items listed are retroactive budget adjustments.

We covered Interpretive Assistant work with existing Arboretum staff. We would like to shift the \$9,000 we budgeted for Interpretive Assistant from Personnel to Plants & Installation for the Garden under Equipment/Tools/Supplies, to cover the additional costs we are incurring there.

To stretch our exhibit contract dollars, the Arboretum took on the labor of tracking down and acquiring some of the exhibit materials. We then needed to run the purchase of these materials through Arboretum purchasing rather than KidZibits. We would like to shift \$6,825 from the KidZibits Contract to Equipment /Tools / Supplies to purchase these ourselves.

We have covered nearly 2/3 of Lead Gardener planning work with existing Arboretum staff. The Lead Gardener's June salary will be \$4,617 although this has not hit our books yet. We would like to shift the remaining \$4,584 of the \$7,084 balance from Personnel to Plants & Installation under Equipment / Tools / Supplies to cover additional costs we are incurring for the Garden.

Our original budget estimated that the 3 main garden construction costs as: Soil Preparation, Irrigation, and Mulch with a cumulative cost of \$18,000. The actual cost that is being incurred for these activities is \$16,030. We are proposing to shift the remaining \$1,970 to Line 23 to cover additional costs we are incurring for Plants & Installation.

Interpretive signage \$12,000 in our original proposal included 3 main items: graphic design, signposts, and sign production. We would like to shift \$5,000 from Interpretive Signage under Equipment / Tools / Supplies to Contracts to cover graphic design of interpretive garden signs. This contract was awarded according to UMN contract procurement guidelines. Tara Lundborg is also the same graphic design firm procured by KidZibits for the Gallery exhibits, to insure consistency in the project. Production of the garden interpretive signage came in under budget. We would like to shift remaining \$1,763 from Interpretive Signage to Microscopes to cover additional costs for microscopes.

Amendment Approved by LCCMR 6/20/2016

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Zones in the garden for pollinators include:

- **Butterfly Zone** – Demonstrates perennials, with sturdy clusters of flowers preferred by butterflies and caterpillars.
- **Compare Zone** – Allows for comparison of native species vs. cultivars and their benefit to pollinators.
- **Bee Lawn** – Planted with dutch clover, ground plum, and coreopsis as an example of a pollinator friendly lawn for low-traffic areas.
- **Wild Bee Habitat** – An example of nesting habitat for native bees.

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: *Facility Exhibits (inside)*

Description:

Exhibits inside the facility will be developed via a standard, four-phase sequence widely used in the museum field: Framework & Concept Development, Schematic & Design Development, Final Design, and Production & Installation. Each phase involves specific tasks, and concludes with a set of deliverables or milestones.

Framework & Concept Development (2 months)

TASKS: Issue an RFP and select exhibit development firm; develop main messages and strategies for engaging the audience; develop list of themes and components for the messages; do preliminary budget allocation; make models; hold scientific review.

DELIVERABLES: Selection of exhibit development firm; statement of exhibition’s learning goals and strategies; preliminary summary listing of exhibition components, space allocations and budget.

Schematic & Design Development (4 months)

TASKS: Research and confirm themes and goals; develop floor plan and spatial arrangement; develop activities list for each area; test prototypes of selected activities with potential audience; develop graphic design look for furnishings and signage; research images; draft text for signage; describe interactives and audiovisual requirements.

DELIVERABLES: Final inventory of components; floor plan; sketches and elevation drawings of components; graphic elements family (“look” of exhibits); list of signs and other graphic elements; refined budget.

Final Design (3 months)

TASKS: Develop details of each activity; develop construction drawings and blueprints; select images and artifacts; finalize interpretive sign text; select props and costumes develop lighting and electrical plan; develop production schedule; review budget; hold scientific review.

DELIVERABLES: Final components list; construction drawings for each component; production-ready graphic design of signs and other elements; props and artifacts list; lighting and electrical specs; fabrication schedule; installation schedule; cost estimates and final budget allocation.

Production & Installation (6 months)

TASKS: Locate fabricators and get bids; award construction contracts; build exhibits; purchase and create props and costumes; produce signs and other graphics; assemble audiovisuals; mount artifacts; install exhibits.

DELIVERABLES: Exhibits built and installed; backup graphics file created; extra props prepared; staff trained on operation and maintenance.

The facility’s indoor exhibit area of 1,600 sq ft will be divided into 6-8 zones. It is preliminary to provide a complete listing of the zones, since this will be a product of the first design phase; however they may include a Blooming Meadow (close-up video of a number of pollinators in action), Meet the Natives (case studies of selected wild bee species), Food for Thought (environmental issues affecting health of pollinators), Inside the Hive (case study of honeybee cooperative society) and Honey House (demonstration honey extraction area).

Exhibit content will be reviewed twice by science experts including Drs. Marla Spivak and Karen Oberhauser:

- 1) During Framework & Concept Development, to check that proposed messages are clearly defined, flow logically and include important concepts and current findings.
- 2) Before Production & Installation proceeds, to check for scientific accuracy and clarity.

Summary Budget Information for Activity 1:

Facility Exhibits (inside)

ENRTF Budget: \$480,027

Amount Spent: \$ 479,887

Balance: \$140

Activity Completion Date: August 31, 2016

Outcome	Completion Date	Budget
<i>1. Exhibits Framework & Concept Development phase complete</i>	June 30, 2015	\$24,729
<i>2. Exhibits Schematic Design & Design Development phase complete</i>	December 31, 2015	\$24,910
<i>3. Exhibits Final Design phase complete including plant labels</i>	February 28, 2016	\$39,716
<i>4. Production & Installation of Exhibits complete</i>	August, 2016	\$399,645

Activity Status as of: December 16, 2014

This activity’s first step is to issue an RFP and select an exhibit development firm. We have not been able to proceed with the Pollination Education Center design and construction schedule we originally provided with our ENTRF proposal due to the need to secure funding for site infrastructure costs and delays in receiving University of Minnesota Board of Regents approval for the project. Therefore, we have not been able to move forward with our existing building design contract, nor to set up a new contract with an exhibit development firm. With the approval of the Bee & Pollinator Center by the Regents in mid-December, we will now be able to move forward with the Framework & Concept Development phase, followed by Schematic Design and Design Development phase.

The Manager of Interpretation has completed 30 hrs of effort for Activity 1, for in-house planning meetings, information gathering and site visits to other pollination exhibits.

Activity Status as of: June, 2015

An RFP was issued in mid-March. Interested exhibit design firms attended an informational session at the Arboretum. Proposals were received and scored by Arboretum staff and University of Minnesota Capital Planning & Projects Management (CPPM) staff and University of Minnesota Purchasing staff. KidZibits was selected as the Exhibit Development firm for the project in May, 2015. Work on Exhibit Framework & Concept Development began immediately following the selection of the firm. A work group consisting of staff from the Arboretum, Kidzibits, MS&R Architects and CPPM are meeting weekly through June. A summary report for Exhibit Framework & Concept Development will be submitted by KidZibits by June 30, 2015. ***This report will include an exhibition narrative, key science concepts, exhibition floor plan and perspective sketches of several exhibit zones.***

Review sessions with a wider stakeholder group of Arboretum administrators and University of Minnesota scientist collaborators will be held by mid-July. Schematic and design development for individual exhibit zones will occur from July – December 2015. This phase will include drafting text, gathering images, establishing the design “look and feel” of the gallery, developing how interactives will function and testing prototypes with visitor audiences.

While the University of Minnesota CPPM office has not yet received an invoice from KidZibits they are anticipating receiving invoices as the project progresses along the timeline stated above.

Activity Status as of: December, 2015

Work on exhibit development has proceeded in the following stages that were identified in the initial Work Plan.

Concept Plan: Meetings with Arboretum staff, CPPM (University of MN Capital Projects Planning and Management), project architects, science advisors and KidZibits began promptly in June, once the exhibit contract with KidZibits was signed. KidZibits completed and submitted the Exhibits Concept Plan by July 1, 2015. It was then reviewed by Arboretum and UMN Capital Planning, and a few minor revisions were requested.

Visual Preferences Study: Next KidZibits led a visual preferences study session attended by Arboretum Administration, Arboretum Education, MS&R Architects and UMN Capital Planning to explore and arrive at a consensus on the type and “look” of exhibits desired.

Schematic and Design Development: KidZibits staff met regularly with Arboretum staff through the summer to develop exhibit briefs listing key concepts and stories to be conveyed in each zone of the gallery. This exhibition team met with science advisor teams at University of Minnesota to review information in exhibit briefs for accuracy, to prioritize concepts and to identify video and other resources. Results of these sessions were incorporated into the exhibit briefs. KidZibits presented a proposed exhibition floor plan identifying components for each zone and placement of zones on the exhibition floor for review by Arboretum, UMN Capital Planning and MS&R Architects on October 29. Design briefs will continue to be updated as new images and text are added through end of December.

Exhibits Final Design: Overlapping with the end of Design Development, during December KidZibits and Arboretum staff began production of batches of exhibition components scripts (i.e. text for exhibition signage); each batch will receive 2 rounds of review. The first batch will enter Draft Review by science advisors, other Arboretum staff and UMN Capital Planning before Christmas. It will receive Final Review by Arboretum and UMN Capital Planning in early January. Continuing through the winter, the remaining 4-5 batches of scripts will be produced for each exhibition zone and fed into the same review system. Life-size mockup of exhibit components and a design / graphic vocabulary study also began in December, to continue through mid-January. Graphics layout is scheduled to begin in February 2016.

Final Report Summary:

The **Pollination Education Center** is located on the Arboretum's 28 acre Farm Garden Campus that is connected to the rest of the Arboretum by a NEW paved road. The building includes 6,700 square feet to be used as an educational facility and includes: an Interactive Exhibit Gallery, Learning Lab, Honey House, Demonstration Apiary, and a Garden for Pollinators.



Supported by the Environment and Natural Resources Trust Fund, both the indoor exhibits and outside garden displays have been designed to provide visitors with a unique experience to step into the world of pollinators – to **better understand where pollinator health, human health and the health of the land itself intersect**. The exhibits **play with our human sense of time and scale**, grabbing the visitors' attention while honoring content authenticity— e.g. using time lapse photography, magnifying tiny things, role playing. Displays offer real-world ways for visitors to apply the information in order to create more pollinator-friendly environments in their yards, community, places of business and more.

Interactive Exhibit Gallery - Exhibits are focused on helping visitors grasp the basics of pollinator science. Topics include:

- The intricate relationships between flowers and their pollinators,
- The critical role of pollination in plant reproduction and in maintaining species diversity,
- How pollination is vitally important for many food crops,
- Creating pollinator-friendly landscapes in urban and rural settings, by helping to preserve and restore diversity and health of native habitats.



The following University of Minnesota researchers were close advisors in the development of the **4 exhibit zones: Flowers, Honey Bees, Wild Bees, and Monarchs & More:**

- Dr. Marla Spivak, *Distinguished McKnight University Professor Apiculture / Social Insects, University of Minnesota and*
- Dr. Karen Oberhauser, *Professor, Department of Fisheries, Wildlife and Conservation Biology, University of Minnesota*



ACTIVITY 2: *Garden for Pollinators (outside)*

Description:

The Garden for Pollinators will be sited immediately adjacent to the exhibits and teaching building, to easily integrate the educational messages of the inside exhibits with opportunities to watch live pollinators in action outdoors. This will reinforce messaging and encourage ready use of the outdoors as a real-world learning lab by both general visitors and in hands-on programming for adults, children, schools and families.

Design Development (3 months)

TASKS: Issue RFP and interview applicant landscape architecture firms; award contract; form Garden for Pollinators Work Group; develop plant list with scientist input; design layout, including garden entrance, pathway circulation system, garden beds, central gathering or patio area, irrigation, teaching zone, interpretive displays and signage.

DELIVERABLES: Garden design; plant list and planting plan.

The selected landscape architect will join a workgroup that includes the Arboretum Curator, an Arboretum Gardener and the Arboretum Interpretation Manager. This group will develop the garden design including all components listed above. The Garden for Pollinators will also present demonstrations of other features such as “basking rocks” for butterflies and habitat sites for various native bee species. To prepare for determining the planting plan, Arboretum staff will gather input from University of Minnesota experts Drs Marla Spivak and Karen Oberhauser as well as Minnesota State DNR staff to develop a “best practices” list of plant species to be recommended for pollinator-friendly landscaping. The plant list and planting demonstrations will be organized by season of bloom, highlighting for visitors the importance of providing plants in bloom, thus food for flower feeders, all season long. To help visitors easily gather ideas for planting, it will be organized into planting zones by bloom time: Spring, Early Summer, Late Summer, and Early Fall. Each planting zone will include top nectar and pollen producing perennials, shrubs, groundcovers and trees for that season. A demonstration planting of milkweed species will include interpretation on monarch butterflies, the monarch migration and the essential role that habitat requirements play en route for its success.

Final Design & Plant Orders (3 months)

TASKS: Do construction drawings including grading, drainage, bed structure, pathway construction and other features; create planting plan; find sources and order plants that have not been treated with systemic insecticides; order irrigation equipment.

DELIVERABLES: Construction drawings; plant and equipment orders.

Develop Interpretation (2 ½ months)

TASKS: Research and write sign text; develop displays of habitat features for native pollinator species including native bee nesting sites and rocks for butterfly basking; design graphics.

DELIVERABLES: Production-ready graphic designs for signage; designs for interpretive displays.

Construction & Planting (4 ½ months)

TASKS: Do grading; layout and install pathways; prepare planting beds and amend soil; install irrigation; install plantings and mulch; install signage and habitat features.

DELIVERABLES: Garden and displays are complete.

Summary Budget Information for Activity 2:

Garden for Pollinators (outside)

ENRTF Budget: \$132,473

Amount Spent: \$ 132,346

Balance: \$127

Activity Completion Date: July 31, 2016

Outcome	Completion Date	Budget
1. <i>Develop Pollinator Garden Design</i>	December, 2015	\$15,000
2. <i>Develop Pollinator Garden Interpretation</i>	January - March, 2016	\$5,000
3. <i>Build, plant and install interpretive displays in Pollinator Garden</i>	April - July, 2016	\$ 102,000

Activity Status as of: December 16, 2014

This activity's first step is to issue an RFP and select a landscape architect firm. For the same reasons mentioned above, we have not yet proceeded with this step.

The Manager of Interpretation has completed 5 hrs of effort for Activity 2, in information gathering through meetings with University of Minnesota Entomology Department staff and in attending pollination symposia.

In addition, Education Department Staff has worked internally and with members of the Arboretum's Board of Directors to envision the flow of public visitation and school program activities within the Center. The outcome of these discussions was the following list of criteria developed to guide the facility design team and articulate the requirements of various stakeholders:

Maximizing Educational Opportunities and Minimizing Costs and Safety Risks At the Pollination Education Center

Optimizing full use of surrounding landscape

The building layout needs to link interior views with key features in the surrounding landscape in a way that aligns with and supports educational goals for both structured program participants and casual walk-through learners. This easy inside/outside attention flow will kindle curiosity and learning.

- Prime scenic vista to the west over future Pollinator Meadow needs to be available as a *view* for visiting public in the Exhibits area, rather than be restricted to Lab users.
- Creating a Pollinator Meadow vista is key to opening up the gallery experience and grounding the exhibits on native pollinators inside with an authentic, real-life backdrop.

Ensuring smooth operation of school fieldtrip programming

The floor plan must support good traffic flow during school programs that require ongoing rotations of class-sized groups (25-30 kids) around active learning sites inside and outside the facility.

- The current draft includes a view onto the Welcoming Terrace from the Lab; noisy arrivals and other entrance activities will be a distraction for kids "in class" in the Lab.
- A prime focus of Lab instruction requires a view into Apiary from Learning Lab.

Optimizing exhibits for maximum visitor visibility, learning experience, and economical operation

The Honey House is the heart of the building. Maximizing the visitor experience requires it to be adjacent to the Exhibit Gallery. We must be able to run the building with one staff working in front of or inside the Honey House who is ready to answer questions, serve samples, and keep an eye on the Exhibit Gallery.

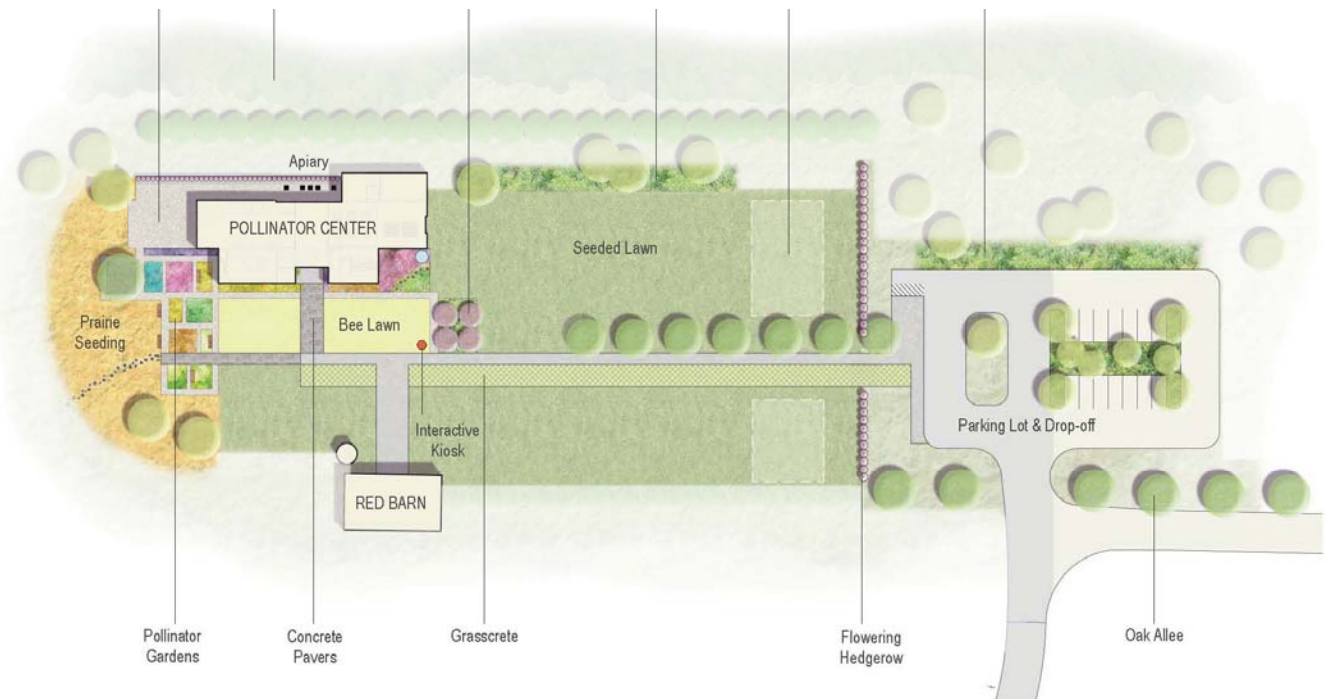
Supporting visitor safety and providing convenient amenities

- Convenient access to restrooms from outside is essential, and needs to be clearly visible to walk-up visitors.
- Traffic flow must prevent visitors' outdoor access to Apiary, which must be visible to visitors from inside the Gallery only.

Activity Status as of: June, 2015

University of Minnesota Capital Planning & Projects Management (CPPM) is coordinating the construction of the Pollination Education Center, which includes the Garden for Pollinators. CPPM directed that design of the Garden be prepared by landscape architect firm Damon Farber, already selected by competitive process as a member of the Meyer Scherer Rockcastle (MS&R) architect team. Therefore we did not issue an RFP or choose a separate landscape architect as this Work Plan originally detailed.

An initial draft design of the Garden for Pollinators, as part of the overall landscape for the facility, was prepared by Damon Farber in April 2015 for review by stakeholders. Discussion of garden layout and its relation to the building, parking, pedestrian and vehicle circulation and vistas on the campus ensued. A new iteration of the Garden Design is now being prepared, that will accommodate traffic flow of visitors between parking and adjacent buildings, and spotlights the Demonstration Garden for best outdoor learning usability by visiting public and by fieldtrip and other program groups. Arboretum scientists and interns are currently doing observations onsite through this growing season to identify native plants, shrubs and perennials that receive high visitation from wild bees, honeybees and other pollinators, to include in the plant list for this garden. The following is the working draft of the layout of this space:



Activity Status as of: December, 2015

Garden Design: As the landscape architect collaborator with MS&R Architecture for the project, Damon Farber led several garden design planning sessions to gather input for the Garden for Pollinators from Arboretum staff, MS&R and UMN Capital Planning. Damon Farber also developed a larger Eastern Campus design that was not part of this project’s work plan, but was essential to complete before work on the Garden for Pollinators design could proceed. The series of schematic designs produced by Damon Farber for the overall Campus included pedestrian and vehicle connections between the arrival roadways, the existing Red Barn and the new Bee & Pollinator Discovery Center. Once this schematic design was approved, and the “footprint” of the Garden and its visitor and maintenance entry points were determined, Damon Farber created several rounds of schematic design for the Garden for Pollinators. These were reviewed by Arboretum Education & Horticulture staff, MS&R and UMN Capital Planning and feedback provided during September & October. Next step will be to place plant orders in January.

Interpretive Signage for Garden: Arboretum staff led the creation of a broad-stroke concept plan for the Garden's interpretation that informed the Garden design process described above. This concept plan was reviewed by UMN science advisors. Once Garden design was finalized, detailed planning for interpretive sign types, sizes and locations proceeded. Draft sign text and image gathering took place in November and early December.

Development of the interpretation was informed by a successful citizen science "pollinator observation" pilot project conducted at the Arboretum Learning Center from June – September of this year. Adults and children were eager to participate and submit their data on # pollinator visits to each of the 8 annual flower varieties included in the study. Next step will be to start graphic design process for signage in January.

Final Report Summary:

Garden Features

The Garden for Pollinators is designed to demonstrate an array of plants that are valuable for use in pollinator-friendly landscaping and provide food for pollinators throughout the entire growing season – every day from April through late September. The gardens are planted with native plants, native cultivars and some landscape ornamentals. Interpretive signage provides tips on planting for pollinators, observing pollinators, and offers citizen science opportunities.



Zones of the Garden for Pollinators

Butterfly Zone – Focuses on demonstrating perennials, with sturdy clusters of flowers preferred by butterflies. Also features perennials that feed several species of caterpillars.

Compare Zone – Includes two beds in which native species are planted alongside cultivars to allow for visitors to observe pollinator behavior.

Bee Lawn – This demonstration lawn is planted with dutch clover, ground plum, and coreopsis and is an example of a pollinator friendly lawn that would work well in a low-traffic area.

Wild Bee Habitat – Minnesota has over 400 species of wild bees – 70% of these bees are ground nesters and 30% nest in stems. This demonstration shows how to create bare soil nesting habitat, leave a fallen log, and provide stems for nesting.



Other Beds – The other beds are designed to show flowering plants with different shapes, sizes, and colors to attract different types of pollinators that bloom every day from April through late September.

Hungry Every Day

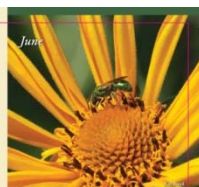
Pollinators feed on flowers. Nectar and pollen are their "bread & butter." The species you see can change through the year; many adults live just a few weeks. It might be mining bees in May or long-horned bees in July. How could you welcome them all?



TIP: Up the Blooms

Stock your garden pantry with more native flowers. Choose trees, shrubs and perennials with bloom times that overlap to cover the entire growing season. Watch a panorama of beauty and wonder unfold, from April through September.

Maple and willow provide early sources of pollen in April.



About the Lawn

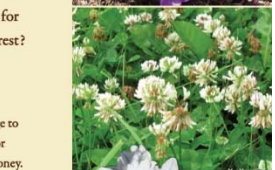
A carpet of green grass is the most durable living surface for sitting, sports, picnics and play. Yet a lot of effort and expense is often used for fertilizer, mowing and treatments. Lawns with 100% turfgrasses are food deserts for pollinators. Keep "active use" areas of lawn as turf, but what about the rest?

TIP: Add Some Flowers in the Grass



Turning the patch by the garage to low-mow fescues and pollinator flowers could save time and money. Clover takes nitrogen from the air, so lawns with clover need less fertilizer.

Early spring bulbs like puschkinia are popular with bees and bloom every year, before mowing starts.



V. DISSEMINATION:

Description:

The “Pollination Education Center at the Minnesota Landscape Arboretum” facility will be a resource for all ages. Its Garden for Pollinators will welcome visitors during all hours the Arboretum Grounds are open (daily year-round closing at sunset, closed Thanksgiving and Christmas). The building will also have regular open hours, and will provide an ideal location for hands-on programming for both children and adults. From school fieldtrips to summer day camps for children; from adult classes to public festivals and free weekend, drop-in family programming, Pollination Place will be an exciting hub of activity at the Arboretum.

The Arboretum is committed to ensuring its facilities, programs and resources are accessible to all Minnesotans. In 2013 over 49,000 children received free admission to the Arboretum. The following outlines the Arboretum’s admission policies and other ways it seeks to foster accessibility for underserved communities:

Admission policies. Regular admission for adults is \$12. The Arboretum provides free admission to all children 12 and under, whether they arrive with their family or with a school group. In addition, schools that reserve a self-guided visit in advance receive free admission for their adult leaders. Other reduced admission opportunities are:

- **Free Thursdays all day;** November through March
- **Free every third Thursday of the month after 4:30 pm;** April through October
- **Special group admission for groups of 15 or more, includes driver,** \$7 per person, Mon-Fri only, without an Arboretum tour guide
- **Free admission for Carver County residents;** yearly event
- **Free admission during January**
- **Free admission for members;** yearly membership begins at \$49, and include many other benefits

Fieldtrips. While the Arboretum charges \$5 per student for its hands-on fieldtrips, we seek to serve all schools and students regardless of ability to pay. Philanthropic support is used to provide scholarships that reduce program fees by half for schools with more than 30% of their students eligible for free/reduced lunch. Scholarships are available to waive fees completely, making fieldtrip programs free, for schools with more than 50% of their students eligible for free/reduced lunch. Recognizing transportation costs may be an obstacle for many schools, the Arboretum also offers transportation stipends of \$285 per bus to reimburse schools for bus costs. These are available on a first come, first served basis for up to 35 schools yearly; schools with more than 50% of their enrollment on free/reduced lunch may apply for one. These opportunities are widely publicized via the Arboretum’s website, a print fieldtrip guide distributed to teachers and districts across the 7 county metro area, and at the annual Minnesota Education Association Conference held every October.

Activity Status as of: January, 2015

There was no activity in the area of dissemination during this reporting period.

Activity Status as of: June, 2015

The Arboretum is still in the planning phase of the design for the Pollination Education Center. However, the Arboretum is very much playing a leadership/convening role around this issue and is hosting an upcoming Pollinator Summit on August 13, 2015, that will offer a tour to interested participants of the future home of this Center.

Activity Status as of: December, 2015

Program development for new school fieldtrips for the 2016-17 school year began in October. Other Education Dept staff also began planning programs and activities for families and adults.

The Arboretum hosted a well attended Pollinator Summit for 145 participants in August 2015. The following are highlights from this event:

SUMMIT HIGHLIGHTS

**** Presentations can be found at www.arboretum.umn.edu/Pollinators2015.aspx**

PLENARY SESSION SPEAKERS

TOM MELIUS, Regional Director for the Midwest Region, U.S. Fish and Wildlife Service

MARLA SPIVAK, PH.D., MacArthur Fellow, Distinguished McKnight Professor, Extension Entomologist, University of Minnesota

KEYNOTE PRESENTATION

Reconnecting Landscapes in the Anthropocene, SARAH BERGMANN, Founder and Director, Pollinator Pathway®

PANEL DISCUSSION

Design and Management Perspectives: Opportunities and Challenges in Planting for Pollinators

BOB ENGSTROM, President, Robert Engstrom Companies

FRED ROZUMALSKI, RLA, Landscape Ecologist/Landscape Architect, Barr Engineering Company

RON BOWEN, President, Prairie Restorations, Inc.

CONCURRENT SESSIONS

Landscape Planning and Design

Pollinator Primer - What's the Buzz?

IAN LANE, Graduate Researcher, University of Minnesota

Tools for Landscape Connectivity and Pollinator Corridors

SARAH BERGMANN, Founder and Director, Pollinator Pathway®

Pollinator Pockets and Unconventional Spaces

ANGIE DURHMAN, Founder, AD Green Roofs, LLC

Policy Barriers and Successes

TIM POWER, Government Affairs Director, Minnesota Nursery and Landscape Association

Planting Design Specifications for Pollinator Habitat in a Built Environment

FRED ROZUMALSKI, RLA, Landscape Ecologist/Landscape Architect, Barr Engineering Company

Plant Materials and Supply

BILL CARTER, President, Prairie Moon Nursery

Landscape Management and Maintenance

Pollinator Primer - What's the Buzz?

ELAINE EVANS, Graduate Researcher, University of Minnesota

Maintaining Plant Diversity in the Landscape

DOUG MENSING, Senior Ecologist, Applied Ecological Services, Inc.

Commercial Plant Production and Integrated Pest Management

JOHN DANIELS, Vice President - Production and Wholesale, Bachman's, Inc.

ERIC NORDLIE, Director of Greenhouse Production, Bachman's, Inc.



2015 POLLINATOR SUMMIT
Designing for Pollinators ~ Enhancing our Communities

Thursday, August 13, 2015 | 8:30 a.m. - 4:30 p.m.
Minnesota Landscape Arboretum | Chaska, MN
\$70 Members & Affiliates/\$80 Non-Members
612-301-1210 | www.arboretum.umn.edu/Pollinators2015.aspx

Sarah Bergmann | *Pollinator Pathways, Seattle, Washington*
Marla Spivak | *Distinguished McKnight Professor, University of Minnesota*
Tom Melius | *U.S. Fish and Wildlife Service, Midwest Region*

Case Studies | Planning and Design Sessions | Landscape Management and Maintenance Sessions | Happy Hour and Networking

UNIVERSITY OF MINNESOTA

Landscape Management for Turf, Parks, and Open Spaces

ADAM ARVIDSON, Landscape Architect, Minneapolis Park and Recreation Board

Assessing Life Cycle and Habitat Needs for Pollinators

SARAH FOLTZ-JORDAN, Pollinator Conservation Specialist - Great Lakes Region, The Xerces Society

Public Perceptions: It's all in the Eye of the Beholder

JOAN MACLEOD, ASLA, PLA, LEED AP, Vice President, Damon Farber

Final Report Summary:

The NEW Pollination Education Center will officially open to the public on September 18. But educational public events and interactive opportunities already planned for this new space include:

1) 2016 POLLINATOR SUMMIT

Thursday, August 18th, 2016, 9:00 a.m. - 4:30 p.m.

SUMMIT OVERVIEW

The 2016 Pollinator Summit will focus on plants and plant choices as an important solution to protecting pollinators on our urban landscapes, including current research and best practices that can be applied in your own work or community. The Summit will feature:

- Current research information focusing on bee nutrition, and the connection between healthy pollinators and plants, including native and non-native plant species.
- Projects with a goal of protecting pollinators, and that demonstrate best practices in planting design, plant selection, and plant management, including lessons learned on both private and public lands.
- Local and regional policies affecting landscape development and management that address pollinators, to inform future needs and work.
- Wild Bee Safaris - get up close and personal with native bees and other pollinators in the garden.
- **The Conference will include a sneak peak at the Pollination Education Center.**



2) FIELD TRIPS

The Arboretum has published its 2016-2017 field trip guide that now includes **Field Trips about Pollination**. These offerings are publicized on the Arboretum's Website

<http://www.arboretum.umn.edu/PollinationFieldTrips.aspx> and published in a printed field trip guide that is distributed to: 1) teachers throughout the Twin Cities Metro Area; 2) made available at the annual Minnesota Education Association teachers' conference on October 20-21 at the which the Arboretum is an exhibitor; 3) and at the Arboretum's booth at the Minnesota State Fair that will be staffed throughout the entire run of the State Fair.

The field trips to be offered are:

Pollinator Superheroes - Grades K-2 - September 12 - June 2

Meet Minnesota's pollinator superheroes during this dynamic field trip experience at the Arboretum's new Pollination Education Center. Find out about the Monarch butterflies' wow-worthy lifetime journeys, learn about the important work of hundreds of different kinds of native bees and bumblebees, and explore the life of the amazing honeybee whose colony can pollinate thousands of acres of food crops and hundreds of pounds of honey in one summer! Meet these and other amazing pollinators and discover their incredible super powers in the new exhibit gallery. Get a taste of the honeybee's amazing gifts from the hive in the Honey House. Get a pollinator's perspective on flowers by zooming in to see the pollen and flower structures that entice these pollinator superheroes to visit.



MN State Science Standards

- 0.4.1.1.2 Living things are diverse
- 0.4.2.1.1 Natural systems
- 1.4.2.1.1 Natural systems have many components that interact (Interdependence)
- 1.4.2.1.2 Animal habitats
- 1.4.3.1.1 Animal life cycle stages
- 2.1.1.2.1 Scientific Inquiry
- 2.4.1.1.1 Diversity
- 2.4.2.1.1 Natural Systems (Interdependence)
- 2.4.3.1.1 Plant life cycle stages



Pollinators, Plants, and People: Partnerships for Life - Grades 3-5 -

January 10 - June 2

Tour the Arboretum's new Pollination Education Center to find out how plants and pollinators are specially designed for one another. In the Learning Lab you will zoom in to find out how flowers are designed to fit pollinator bodies and how this unique partnership benefits both plants and pollinators. In the Honey House you will explore gifts from the hive and find out how people are harnessing the power of pollinator-plant partnerships. You will have time to tour the Exhibit Hall to learn more about the critical relationships Minnesota pollinators have to Minnesota plants and find out what role people play in making sure these relationships remain productive and healthy. Perform a pollinator census in the pollinator garden and find out how you can participate at your school. All students will plant a pollinator friendly plant to take home!

MN State Science Standards

- 3.1.3.4.1 Scientists use tools and mathematics
- 3.4.1.1.1 Compare how different structures serve various functions
- 3.4.1.1.2 Grouping based on characteristics, structures, and behaviors
- 3.4.3.2.2 Adaptations for survival and reproduction
- 4.1.2.1.1 Describe impacts of designed world on natural world
- 5.1.1.2.2 Scientific Inquiry identify and collect relevant evidence
- 5.1.3.4.1 Gather, analyze, and interpret data
- 5.3.4.1.3 Compare the impact of decisions and natural systems
- 5.4.1.1.1 Describe how plant and animal structure and functions provide advantage for survival

Picnic with the Pollinators - September 12 - June 2 - 1 hour added to a Field Trip

Bring your bag lunches and add this 1-hour extension onto any field trip! A great way to check out all the features of the new Pollination Education Center, enjoy 30 minutes for lunch in the new Learning Lab or Pollinator Shelter followed by an exclusive guided experience that uncovers the vital roles plants and pollinators play in food production. Finally, end your picnic by taking part in the sweetest scientific taste test ever: seasonal honey!

MN State Science Standards

- 0.4.1.1.1 Observe and compare plants and animals
- 0.4.2.1.1 Observe a natural system
- 1.4.2.1.2 Habitat
- 2.4.3.1.1 Life cycles
- 3.4.1.1.2 Living things are diverse
- 5.4.1.1.1 Plant and animal structures and functions



VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	\$ Amount	Explanation
Personnel:	\$21,000	.20 FTE Lead Gardener, .20 FTE Interpretive Asst
Professional/Technical/Service Contracts:	\$495,000	Exhibit developer contracts for design and production of exhibits; landscape architect contract for garden & irrigation design
Equipment/Tools/Supplies:	\$99,000	Supplies for garden construction & outdoor interpretation; teaching equipment
TOTAL ENRTF BUDGET:	\$615,000	

Explanation of Use of Classified Staff:

Explanation of Capital Expenditures Greater Than \$5,000: Exhibits, displays and signage at the Pollination Place facility and garden will be coordinated by Minnesota Landscape Arboretum, and will remain installed at the Arboretum for their entire working life, to support increased public understanding of the importance of pollinators.

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: .40 FTE

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

Exhibit Development Contract 6.5 FTE's
Landscape Design Contract .2 FTE

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Private Donors	\$ 2,850,000	\$2,850,000	Funding secured by Arboretum for building & access road construction <u>Construction Costs Final Estimate is: \$6,382,000) Raised to date from private donors for capital construction - \$6,139,925.82)</u>
Minnesota Landscape Arboretum Foundation – Unrestricted revenue	\$80,158	\$34,344	In-kind services provided by Arboretum personnel: Director of Operations (.05 FTE – includes 45 hours), Manager of Interpretation (.75 FTE – includes 720 hours), Manager of Youth Education (.05 FTE – includes 15 hours)
TOTAL OTHER FUNDS:	\$ 2,930,158	\$2,884,344	

VII. PROJECT STRATEGY:

A. Project Partners:

Peter Moe, Arboretum Director of Operations, will coordinate design and development of Garden for Pollinators plantings, structures and circulation system.

Sandy Tanck, Arboretum Manager of Interpretation, will lead planning to design, develop and produce interpretive displays and signage inside facility and in outdoor Garden for Pollinators.

Randall Gage, Arboretum Manager of Youth Education, will ensure exhibits, gardens, facility and interpretation align with program needs for schools and children.

Marla Spivak, Professor of Entomology, University of Minnesota, will review proposed exhibit and garden designs, interpretation and plant lists for accuracy, clarity and message relevance. Scientist content review provided gratis.

Karen Oberhauser, Assistant Professor of Forest Resources, University of Minnesota, will review proposed garden interpretation and plant lists for accuracy, clarity and message relevance. Scientist content review provided gratis.

B. Project Impact and Long-term Strategy:

The “Pollination Education Center at the Minnesota Landscape Arboretum” with its facility and gardens will be the first feature attraction to be built in a new eastern Red Barn Campus the Arboretum is developing. The goals of the Red Barn Campus are to demonstrate sustainable landscape principles, best practices for cleaner water, and food production and preservation methods for a variety of scales from backyard and neighborhood gardens, to urban agriculture, to small and mid scale rural production. Other features currently planned for the Red Barn Campus will include Best of Minnesota Demonstrations, Grow at Home Demonstrations, Grow in the City Demonstrations, Mid-scale Demonstrations, Indoor & Outdoor Kitchens, Incubator Food Processing Space, State Master Gardener Headquarters, Education Offices & Teaching Pavilions, and a Nature-based Therapeutic Demonstration. The importance of a healthy environment for pollinators is an essential aspect of the message for this campus.

Impact of the facility will be tracked through several existing Arboretum systems. Education staff will prepare yearly attendance reports across all program formats (fieldtrips, festivals, family weekends, camps etc). They also collect and compile evaluation forms from teachers and adult program participants on an ongoing basis. Visitor awareness of the facility will be measured via regularly administered visitor surveys.

C. Spending History:

Funding Source	M.L. 2008 or FY09	M.L. 2009 or FY10	M.L. 2010 or FY11	M.L. 2011 or FY12-13	M.L. 2013 or FY14
2013 LCCMR – Land Acquisition				2,000,000	

VIII. ACQUISITION/RESTORATION LIST:NA

IX. VISUAL ELEMENT or MAP(S):See attached graphic

X. ACQUISITION/RESTORATION REQUIREMENTS WORKSHEET: NA

XI. RESEARCH ADDENDUM: NA

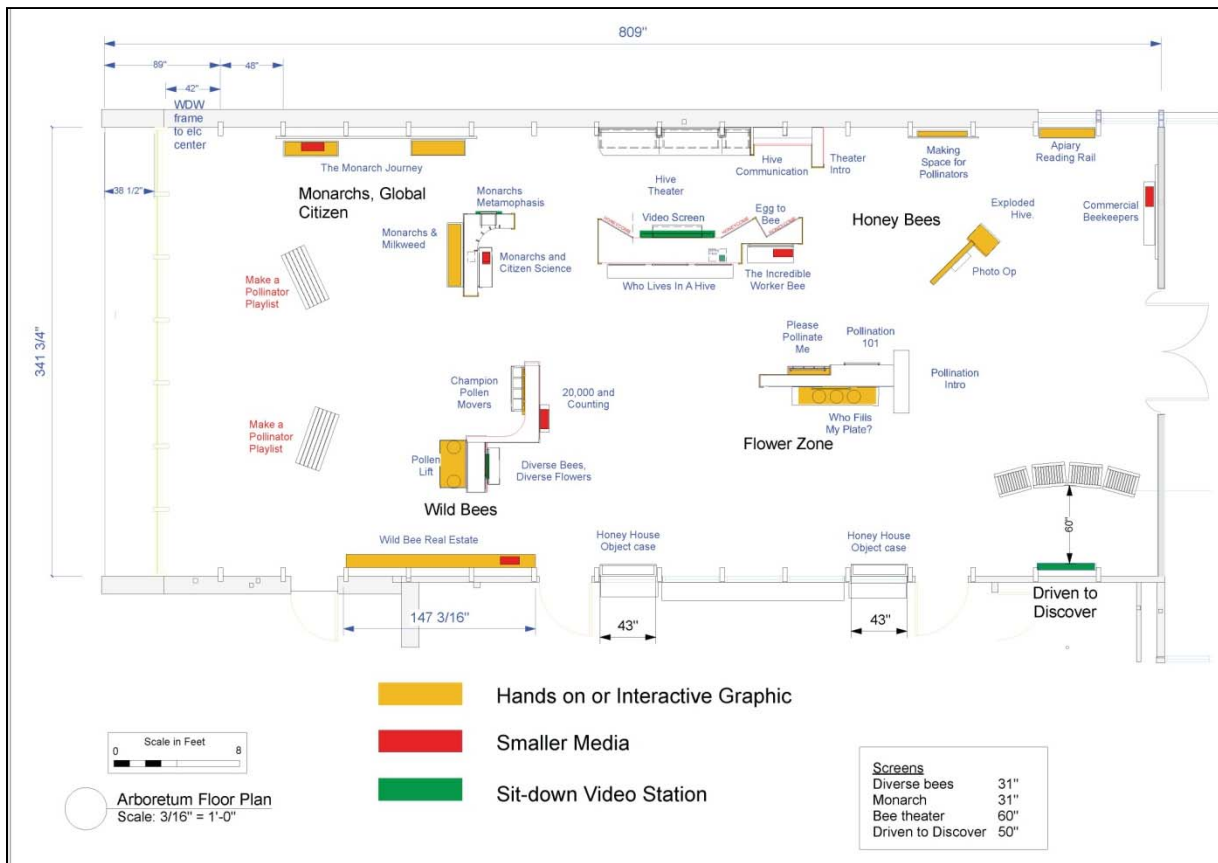
XII. REPORTING REQUIREMENTS:

Periodic work plans status update reports will be submitted no later than January 2015, June 2015 and December 2015. A final report and associated products will be submitted between June 30 and August 15, 2016.



Pollination Education Center – Visual

Exhibit Hall Layout:



How do different bees carry pollen home?

- Bumble bees and honey bees pack a shiny mix of pollen, nectar and saliva into concave leg baskets.*
- Cuckoo bees and yellow-faced bees eat pollen and carry it in their crop to regurgitate later.*
- This green metallic sweat bee carries loose, powdery pollen on stiff bristles of leg hairs.*
- Leafcutter bees and mason bees transport pollen on the stiff hairs covering their abdomens.*

Champion Pollen Movers

Why are bees the best pollinators?

As a result of their fuzzy bodies coated in the long hairs covering their bodies, bees are very good at carrying pollen. They have a special organ in their mouth called a crop. The crop can hold pollen and nectar. The crop can also hold pollen and nectar. The crop can also hold pollen and nectar.

Bees visit hundreds of flowers in a day. In search of pollen for their young, they visit all the new flowers that bloom in their home range.

Pack a Basket **Put it Inside** **Carry a Basket** **Belly Full!**

How do different bees carry pollen home?



Garden for Pollinator Schematic:







**ENVIRONMENT
AND NATURAL RESOURCE
TRUST FUND**

Environment and Natural Resources Trust Fund

M.L. 2014 Project Budget

Project Title: Pollination Education Center at the Minnesota Landscape Arboretum

Legal Citation: M.L. 2014, Chp. 226, Sec. 2, Subd. 09f

Project Manager: Peter C. Moe

Organization: Minnesota Landscape Arboretum

M.L. 2014 ENRTF Appropriation: \$ 615,000

Project Length and Completion Date: 2 years; June 30, 2016

Date of Report - Final Report

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Revised Activity 1 Budget 06/15/2016	Amount Spent	Activity 1 Balance	Revised Activity 2 Budget 06/15/2016	Amount Spent	Activity 2 Balance	TOTAL Revised Budget	TOTAL BALANCE
BUDGET ITEM								
Personnel (Wages and Benefits)	\$0	\$0	\$0	\$4,617	\$4,580	\$37	\$4,617	\$37
TBD, Lead Gardener: \$12,000 (64% salary, 36% benefits); .20 FTE for 1 yr								
TBD, Interpretive Assistant: \$9,000 (92% salary, 8% benefits); .20 FTE for 1 yr								
Professional/Technical/Service Contracts								
KidZibits (competitive bid): Exhibition development consulting to develop exhibition concepts, layout, components, blueprints, lighting, production and installation	\$473,175	\$473,175	\$0				\$473,175	\$0
Tara Lundborg (followed UMN contract procurement guidelines): Graphic design outdoor interpretive signs				\$5,000	\$5,000	\$0	\$5,000	\$0
Damon Farber (competitive bid): Garden design consulting to develop design for garden entry, pathway system, layout of beds, planting plan, irrigation, seating				\$15,000	\$15,000	\$0	\$15,000	\$0
Equipment/Tools/Supplies								
Soil preparation (\$3,000)				\$800	\$800	\$0	\$800	\$0
Irrigation (\$10,000)				\$11,830	\$11,830	\$0	\$11,830	\$0
Plants, installation (\$65,000)				\$80,795	\$80,795	\$0	\$80,795	\$0
Mulch (\$5,000)				\$3,400	\$3,400	\$0	\$3,400	\$0
Interpretive signage, plant labels (\$12,000)				\$5,237	\$5,237	\$0	\$5,237	\$0
Microscopes for outdoor garden teaching (40@ \$100)				\$5,794	\$5,704	\$90	\$5,794	\$90
Exhibit materials: video, images, displays, props - previously part of KidZibits contract	\$6,852	\$6,712	\$140				\$6,852	\$140
COLUMN TOTAL	\$480,027	\$479,887	\$140	\$132,473	\$132,346	\$127	\$612,500	\$267