

2018 Grants: MPM

Milwaukee Public Museum Discovering Milwaukee Fireflies Project

Concept Statement: The Discovering Milwaukee's Fireflies project provides a unique opportunity to educate urban youth from diverse backgrounds about insects, including their biology, environmental interactions, and conservation.

Concept Description: Discovering Milwaukee's Fireflies is a collaboration between the Milwaukee Public Museum (MPM) and the Urban Ecology Center (UEC) in Milwaukee, Wisconsin. We are working together to produce and deliver programming that educates youth (grades 2-12) about firefly biology and natural history. We are developing a variety of hands-on activities and outdoor experiments for educational programs at both institutions, with the long-term goal of continued annual programming. The MPM provides an ideal venue for the Discovering Milwaukee Fireflies project as it develops and offers programs that enable visitors to learn creatively and interactively about the wonders of natural history. MPM's education programs serve children from pre-kindergarten through high school, college, and graduate school. These programs emphasize hands-on, experiential learning that utilizes MPM's world-renowned exhibits and vast collections as a context for connecting topics to relevant curriculum and students' lives. The UEC has strategically positioned itself in urban parks to provide safe, accessible green spaces for all Milwaukee residents. The success of all of the Center's outdoor education and recreation programming relies heavily on the restoration and management of the parks surrounding each branch. The Center's land stewardship team nurtures each green space—Riverside Park, Washington Park and Three Bridges Park—creating

essential community hubs across the city that provide opportunities for increased STEM learning, as well as tangible health benefits to children, families, and adults.

Project Goals and Objectives: The Discovering Milwaukee Fireflies project has two primary goals:

(1) Educate urban youth whose actions will ultimately preserve and enhance the environment, through delivery of inquiry-based learning programs natural-history based programming for this objective will take place at the Milwaukee Public Museum and/or local public elementary schools. This programming involves a presentation to participating youth about basic firefly anatomy, lifecycles and feeding habits, geographic distribution, and behavior. It also provides opportunities to clarify common misconceptions among youth and the general public (e.g., not all fireflies flash, fireflies are beetles not flies, etc.). Once the initial presentation is over, the students have an opportunity to make their own “flashing firefly” by constructing a simple circuit on the back of a cut-out firefly (see [Figs 1A and 1B](#)).

We have piloted this project at numerous venues this spring and early summer and found both youth and their parents to be highly engaged ([Fig 2](#)). Armed with background knowledge of firefly biology, the ecologically-based portion of the project will involve field-based firefly sampling, identification and flash-pattern experiments at the UEC’s green spaces. The program will commence with a brief orientation by MPM staff on Wisconsin fireflies, including a description of sampling and collecting procedures. As a proof of concept, we have developed and tested a randomized sampling scheme for the UEC’s Riverside Park green space. This scheme is comprised of 16 sample sites within the Riverside Park location ([Fig](#)

3). Four team leaders with local youth team members will disperse to one of the 16 sample sites and count firefly flashes within a standardized, circular space (i.e., hula hoop) for 45 seconds in each direction (Fig 4). This procedure will be repeated if more than one species is located at that sample site. Each team will record at 4 of the 16 sites and report their findings back to the larger group. Team members will record flash patterns at each site which will be used to develop identification tools and other educational materials. Team members will also gather voucher samples for species-level identification back in the lab; all vouchers will be deposited in the invertebrate zoology collections at the MPM. The learning outcomes for this project objective are as follows: a) Participants will be introduced to the diversity of fireflies (and possibly other organisms) in the urban ecosystems of Milwaukee b) Participants will learn to recognize a variety of firefly species in their communities and observe examples of potential threats to conserving urban biodiversity c) Participants will learn how to develop hypotheses and methodologies for a modern scientific investigation d) Participants will record observations from the field, communicate their findings to other team members, and discuss the results in a broader context.

(2) Provide scientific education and entomology-based outreach to underserved communities in Milwaukee The Discovering Milwaukee's Fireflies programs will be held at both partnering institutions which have a strong history of hosting innovative and engaging programming to urban youth. It is our collective goal to provide urban children with the opportunity to learn, explore and discover in green spaces right in their own neighborhoods and learn the importance of preservation of the natural world around us. The UEC operates three community nature centers in urban Milwaukee Parks that are open nearly 365 days a year, providing access to

restored and biologically diverse green space for urban residents. The Riverside Park Urban Ecology Center is located between communities represented by a diverse mix of residents based on race, economic status and education. The UEC has focused its efforts where high crime rates, low employment, high dropout rates and low test scores are common. Since 2007, the UEC has served the largely African American Washington Park community and since 2012 the UEC has served the Menomonee Valley, a largely Latino neighborhood. In spite of the current revitalization efforts, these neighborhoods are still some of the most impoverished in the state. These three centers serve over 225,000 visitors per year, including over 32,000 students on field trips or summer camps. The UEC also offers volunteer and multigenerational community programs or lifelong learning opportunities, whereby community science and field-based research is a large component. The UEC has three fulltime Research and Community Science staff who conduct over 300 wildlife surveys per year including weekly bird walks, bird banding, acoustic bat surveys, small mammal trapping, snake coverboard surveys, frog and toad call monitoring, and invertebrate research. The UEC's invertebrate research constitutes the fastest growing suite of programs and has generated much public interest and continues to be among the most attended research programming. These include odonate monitoring, monarch larval monitoring, monarch tagging, bumble bee and other pollinator surveys, singing insect surveys, beetle monitoring, and now firefly research. As Wisconsin's most-visited natural history museum, the MPM is a statewide educational resource and an important cultural treasure. Each year, more than half a million visitors benefit directly from MPM's exhibits, public and school programs, and educational outreach. With its broad reach, MPM serves the residents of Wisconsin as well as visitors and researchers from across the country. Of the half million visitors to the Museum each year, nearly 140,000 are youth. This includes almost 100,000 children visiting on

class trips – more than 20% of whom come from statistically impoverished neighborhoods. MPM is committed to providing and increasing access for those who might otherwise not be able to benefit from the Museum’s educational opportunities. Annually we aim to increase: a) Participation by youth in three MPM educational programs and at three of UEC’s natural spaces b) Academic knowledge and experimental skills by program participants c) Biological data literacy and environmental ethics by program participants
Assessment: We will have two years of attendance data recorded our events and programs. Our primary method of assessment will be to record and compare numbers of participants from previous years to next year’s programs. We will also provide interactive surveys after monitoring events (e.g., pictograph surveys).

Project Budget: We are requesting funding to continue our current programming through the 2019 field season. We are also asking for funds to develop identification guides and purchase equipment for recording flash patterns. Other minor funding is requested for transportation to partnering institutions and local schools.

1. Printing charges for 3 events with hands-on firefly “craftivities” \$300.00
2. Supplies for firefly LED light kits \$300.00
3. Marketing materials and development of identification guides (stickers, t-shirts, save-the-date cards, tattoos) \$400.00
4. Collecting equipment and supplies (hula hoops, nets, vials) \$200.00
5. Data collection supplies (flags, clipboards, datasheets) \$100
6. Camera equipment \$800
7. Transportation to and from UEC green spaces \$400

2018 Funding: Requested \$2,500. Partially funded at \$1,200.