



Research and Community Science

2017 & 2018
Biennial Review

**URBAN
ECOLOGY CENTER**



A MESSAGE FROM THE TEAM

Welcome to the Urban Ecology Center's Research and Community Science 2017 & 2018 Biennial Review! Our team of Community Scientists has become a national leader in supporting collaborative spaces in wildlife research between professionals and the community. Our unique research and monitoring programs allow us to study ecological connections in busy urban public greenspaces. With over 20 research projects being conducted at any given time, there are numerous opportunities



Photos (counter-clockwise from top): Community scientists starting the day early to check small mammal traps. We are pleased to welcome Ethan Bott (participating in the 2018 Green Birding Challenge, center) as the Center's new GIS and Field Data Coordinator. Coyote photographed in Riverside Park by community scientist Bruce Halm.



for the community to participate. We have a relatively long-running program with long-term data sets that enable us to assess trends. We can say with confidence that given the management of many of our greenspaces, we have a substantial amount of diversity today. The number of native plant and wildlife species we have is something to be proud of. Our greenspaces are large enough to support species of wildlife that need larger parcels or higher quality habitat not typically associated with urban areas. The young age of Three Bridges Park and parts of the Rotary Centennial Arboretum mean that the the potential to continue to find new species is quite possible as land management continues. Similarly, the potential for land restoration at Washington Park means that wildlife conditions could continue to improve. Additionally, because Riverside Park is part of the Milwaukee River Greenway, it has the potential to continue to attract new species for many years to come.



The 2017 & 2018 Research and Community Science team (left to right): Community Assistance Fellow Tony Garcia (National Park Service in partnership with the Center), GIS and Field Data Coordinator Jessica Orlando, Research and Community Science Coordinator Jennifer Callaghan, and Manager of Research and Community Science Tim Vargo. Photo taken while co-leading an Eco-travel trip to explore the sunset side of Lake Michigan.



We conduct a wide variety of surveys per year—many of which are in the busy summer months. We couldn't do it without the dedication of our summer interns who are often the first people out in the parks checking mammal traps or closing the building after an evening bat survey. Thank you!

What's in the bag?



The highlight of 2017 was the first-ever living northern short-tailed shrew documented by community scientists representing an entirely new order of mammal recorded in the restored habitats of Riverside Park!

Data collected by community scientists are shared with local, state, national, and international research partners. These data have helped document the effects of climate change and habitat loss on bird populations, the timing of monarch butterfly generations and their annual migration, and how bats are faring post white-nosed syndrome. These data also help tell the story of the Urban Ecology Center's restoration of urban green spaces—the presence of diverse wildlife species particularly environmental indicators, new species, or the return of species that were extirpated for decades. All of this information increases understanding of the restoration process and help us adapt management of these habitats.

—Jennifer, Jessica, Tim, and Tony

Cover photos (clockwise from left): Research and Community Science Coordinator Jennifer Callaghan holding one of the first photo-documentations of a northern short-tailed shrew on July 4, 2018 at Riverside Park (photo by community scientist Charlotte R. Catalano). Community scientists monitoring bats at the Urban Ecology Center-Menomonee Valley during a spring migration acoustic bat monitoring survey in April 2018 (Photo by Chicago-area documentary filmmaker Marianna Milhorat). Young scientists learning how to migrate like birds during the 2017 Green Birding Challenge. Community scientists netting monarchs to tag during a record-breaking 2018 season (photo by community scientist John Chaplock).

WHAT IS COMMUNITY SCIENCE?



Community science is not just collecting data for professional scientists. *Community science is science*—and community members are part of the entire process: advising study designs, collecting data

in the field, formulating (and revising) hypotheses, identifying wildlife, analyzing data, and sharing results with the community. The Urban Ecology Center's Research and Community Science program encourages collaborative spaces for research between professional and community scientists and creates a more engaged, knowledgeable, and ecologically literate community. The Center maintains a network of urban field stations in which all research is accessible to and advised by both community and professional researchers.

Research = Community + Science

Who are community scientists?

Community scientists are students, retirees, neighborhood families, Young Scientist Club members, school groups, educators, professional scientists, natural resources managers, and biologists from partnering organizations and universities. These people are curious about wildlife and ecology, value lifelong learning, and want to contribute to science and conservation efforts. At the Urban Ecology Center, community scientists want to work in urban ecosystems to uncover biodiversity and monitor greenspaces to understand how we can restore the land and inspire change in the community, one neighborhood at a time.



What do community scientists do?

Urban Ecology Center community scientists contribute to all aspects of research and there is a role for everyone, regardless of one's background. Community Science depends on interested and inquisitive community members to safely conduct research for a variety of species and to better understand how wildlife are responding to habitat restoration in urban greenspaces.



Community scientists are observers. They spot and identify wildlife in the field—with binoculars, sound, nets, and even photographs.

Community scientists are volunteers. They generously give their time and talents to collect data and communicate science by analyzing data, writing poems and stories, and sharing results at professional conferences.

Community scientists are leaders. They study and train to lead bird banding, Weekly Bird Walks, odonate surveys, and insect identification. You will find them teaching evening lectures and leading community interest groups. They even work behind the scenes to update maps, analyze data, and report findings.

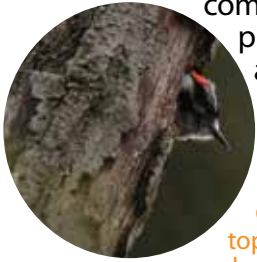
*“The overarching goal of this internship was to become a naturalist—someone who can walk out the door and tell you what time of year it is by the blooming plants or trees or what kind of bird just sang way off in the distance...Although I am years away from this, the internship gave me a terrific head start and added to my education as a hands-on example of science and giving me an appreciation for research. Being outside with nature also gave me great joy and motivated me to be more environmentally conscious. **Nature is now my getaway.**”*

—Spencer Hofschulte-Beck, Menomonee Valley Research and Community Science intern and Marquette University biology student. Students like Spencer (left, along with UW-Milwaukee graduate Xeng Xiong and Marquette University student Danielle Mellin) learn and then train community members to conduct research during their community-based internship.

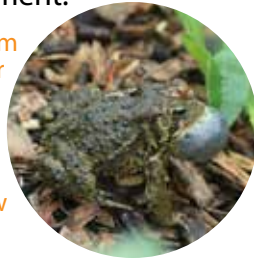
STEWARDSHIP, RESTORATION, AND ADAPTIVE MANAGEMENT



The Urban Ecology Center's Land Stewardship and Community Science teams collaborate to implement adaptive management. Regular monitoring of biotic and abiotic components of urban landscapes informs the efficiency and effectiveness of restoration strategies and when to adjust strategies and goals. How are wildlife responding to the restoration of native plant communities? What species should be planted to sustain invertebrates such as bumble bees throughout the growing season? These questions and more are connected through adaptive management.



Counterclockwise from top: northern flicker and downy woodpecker utilizing resources from managed native habitats in Riverside Park. Photos by community scientist Bruce Halmo. American toad calling in Riverside Park's new stormwater habitat pond.



For the first time, all three Urban Ecology Center greenspaces had prescribed burns conducted in 2018! Prescribed fire is a critical management tool to knock back encroaching woody species, reduce past seasons litter layer, return nutrients to the soil, and invigorate fire adapted native species. These 2018 prescribed burns enhanced 14.1 acres of habitat for native plant and wildlife species—and the community.



In 2017 Riverside Park built a pond to capture and hold stormwater for breeding amphibians and other wildlife. In two years community scientists have already documented American toads, mallard ducks, sandpipers, and odonates such as emerald spreadwing, spot-winged glider, wandering glider, 12-spotted skimmer, and common whitetails in the pond.



Community members work together in all aspects of restoration

20 species of invasive plants removed,
8,917 land stewardship volunteer hours,
205 pounds of native seed planted in 2018!



Mother's Watchful Eye. This mother duck already lost one duckling. Left with only a single baby, she now seemed more intent to safeguard the young one than a day prior when she still had two. Science tells me it is rare for a mallard to rear all her young to maturity, and I recognize I will never know what happened to the lost duckling, nor this pair. After a near week at this newly-constructed ephemeral pond at Riverside Park in Milwaukee, they disappeared. I'd like to imagine a happy ending with the mother and duckling making their way to the river less than 100 meters (200 ft.) away. June 2018. —Charlotte R. Catalano

Check out more of Charlotte R. Catalano's photography in [Where Art Meets Ecology!](#)

REPTILES, AMPHIBIANS, & FISH

Snakes

Community herpetologists search for snakes under coverboards set throughout the summer. The most commonly occurring species is the butler's gartersnake, a State Species of Special Concern native to southeastern Wisconsin. Butler's gartersnakes prefer open to semi-open habitats in wetlands and adjacent uplands, including prairies such as the restored habitats of Three Bridges Park. Community scientists have also documented deKay's brownsnake, which is common throughout Wisconsin. Snake surveys from the past



couple of years have recorded fewer snakes than in previous years. This research is vital for the management of this important species. Stay tuned in the coming years as community scientists monitor long term trends in snake populations.

Community scientists preparing to mark a butler's gartersnake found under a Menomonee Valley coverboard on July 31, 2018 with Research and Community Science Intern Maggie Steinhauer. Mark-recapture methods are used to identify them in the future and assess population trends. Community scientists assist in the handling, recording, and processing of snakes and are essential to quickly catch individuals as the boards are lifted! Photo by community scientist Vesile Yilmaz.



Frogs & Toads



A Toad in the Hand is Worth Two in the Bush by community scientist Adam Carr.

Our amphibian research program is centered on community engagement and up-close experiences in neighborhood greenspaces. Listening to the sounds of breeding frogs and toads near aquatic habitats, (or sometimes in hand like this American toad found on an evening walk through Menomonee Valley) connects the community with urban-dwelling wildlife.

Turtles



On August 31, 2018 Washington Park Educator Laurel Cutright documented the first map turtle species in the Washington Park Lagoon! Map turtles are named for the interconnecting lines on their shell that resemble contours on a map.

This [Ouachita map turtle](#) (also called southern map turtles) was likely a pet release as they are large species that prefer moderate to fast currents which are common in western Wisconsin. Community scientists also found evidence of turtle breeding



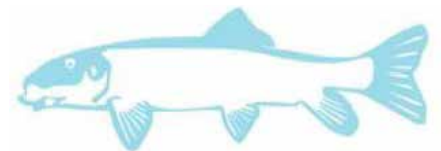
when eggs were found in a woodchip pile at Washington Park and when breeding snapping turtles (which later hatched as juveniles!) were found in the rain gardens that were designed and built into Three Bridges Park.



Turtle photos by UEC staff community scientists Laurel Cutright, Michaela Molter, and Carlos Manriquez.

Fish

The Urban Ecology Center has been a part of a new cutting-edge research project with the Shedd Aquarium and several other partners throughout the state by collecting data on fish migration patterns throughout



the Great Lakes region. Migratory fish carry important nutrients that fertilize the upstream ecosystem on an annual basis. Suckers are being used as the focal species because they migrate into virtually every stream in large numbers and are large enough to be easily seen. By establishing a long term monitoring program, this will help document fish migration patterns into Great Lakes streams. Because suckers are sensitive to temperature changes in the water, this research can help determine how climate change is impacting their migration patterns. This project started in 2017 and will continue into 2019. In its inaugural year, 79 suckers were spotted while in 2018, 47 suckers were recorded. The Urban Ecology Center is excited to be a part of this new research project!



TERRESTRIAL MAMMALS

Terrestrial mammal monitoring at the Urban Ecology Center includes live-trapping small mammals to determine population trends through mark-recapture research, documenting larger mammals with wildlife cameras, and incidental reports by students and park visitors.



In 2017, we documented not only a new species in Riverside Park, but an entirely new order of mammal! Our first northern short-tailed shrew was captured and released from one of the Sherman live traps that are set in the park for a series of 3 evenings. The 21 gram adult female escaped before we could even mark her tail with nail polish or photograph her. A few weeks later, additional shrews were captured and we were able to get our first photo-documentation and start marking individuals to estimate the park's population.

Welcome to Riverside Park, northern short-tailed shrew—a discovery 11 years in the making!

2006: Mammal monitoring began in Riverside Park

2007 & 2008: The research team documented dragonfly wings under a snake coverboard west of the Milwaukee River—a sign of insectivorous activity (small mammals often cohabitate with snakes)

2015: Weekly Bird Walkers found a dead shrew on the Oak Leaf Trail—this could mean a shrew was captured in the park but it could have been dropped by a raptor flying over the park

2017: On July 18, 2017 at 6:45 a.m. a live northern short-tailed shrew was found in a Sherman live trap near the community gardens. And she would not be the last. Later in the season, six more shrews were captured and three dead shrews were also found in the park that summer. Interestingly, Sherman traps are not designed to trap shrews, rather pit fall traps are the preferred method. The use of less than ideal traps along with reports of three additional dead shrews, may indicate that there is actually a larger and healthier shrew population than what has been documented.



Scientific name: *Blarina brevicauda*

(Latin: *brevis*=short, *cauda*=tail)

Order: Soricomorpha

The third largest group of living mammals and previously undocumented at the Urban Ecology Center. Known as “the insectivores”, shrews and moles are one of the oldest groups of mammals that feed on insects, among other prey

Habitat: Semifossorial in vegetated habitats

Preferring where there is cover, such as in a deciduous forest, northern short-tailed shrews live underground using echolocation to navigate and find prey

Diet: Carnivorous & insectivorous

One of only a few mammals with venomous saliva, they paralyze and eat small mammals and invertebrates such as worms, snails, and insects—and because they are highly active, they eat more than their body weight daily! (But don't worry, their venom can't cause significant harm to large mammals, like humans)



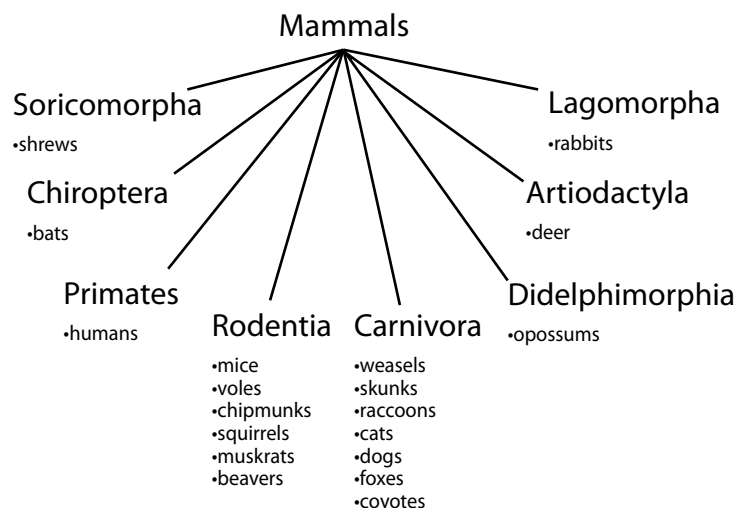
This shrew was photographed August 2, 2017—evidence of the species' arrival in Riverside Park! Community scientists can help bait and set traps in the early evenings and then check traps the next morning. Animals are

captured, marked (with nail polish!), and released to better understand their populations.

[Read more about this exciting new resident on our blog—including links to a TMJ4 video segment and a Milwaukee Journal Sentinel article.](#)

26 species representing 8 orders of mammals

Documented in Urban Ecology Center greenspaces



Photos: Northern short-tailed shrews captured in Riverside Park during 2017 mammal surveys. Photos by community scientist Charlotte R. Catalano.

BATS

(AND OTHER CREATURES OF THE NIGHT)

Walking, paddling, and driving: three methods community scientists at the Urban Ecology Center use to collect acoustic bat monitoring data. Community-based partnerships are at the heart of Wisconsin's bat research where natural resources managers, professional scientists, students, and community members work together to create a truly collaborative research project—from data collection and analysis to monitoring these species. **It is community science at its best.**



"...the bat team identified, measured and tagged several bats before setting them free into the night sky." —WUWM environmental reporter Susan Bence. Photo by Tony Garcia of a WDNR biologist holding a bat captured during mist netting research at Riverside Park. [Read more!](#)

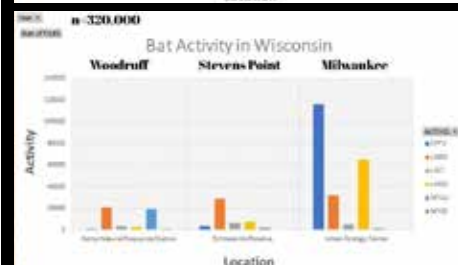


Community scientists at the Urban Ecology Center-Menomonee Valley during a spring migration acoustic bat monitoring survey in April 2018. Photos by Chicago-area documentary filmmaker Marianna Milhorat. [Read more about the importance of these community efforts on our blog!](#)

In 2018, UW-Stevens Point professor, Dr. Chris Yahnke was co-hosted by the Urban Ecology Center for a semester-long sabbatical. Alongside community scientists, Milwaukee area classroom partners, and natural resources managers, original bat research was published and presented to the American Society of Mammalogists and at the Wisconsin Bat Festival.



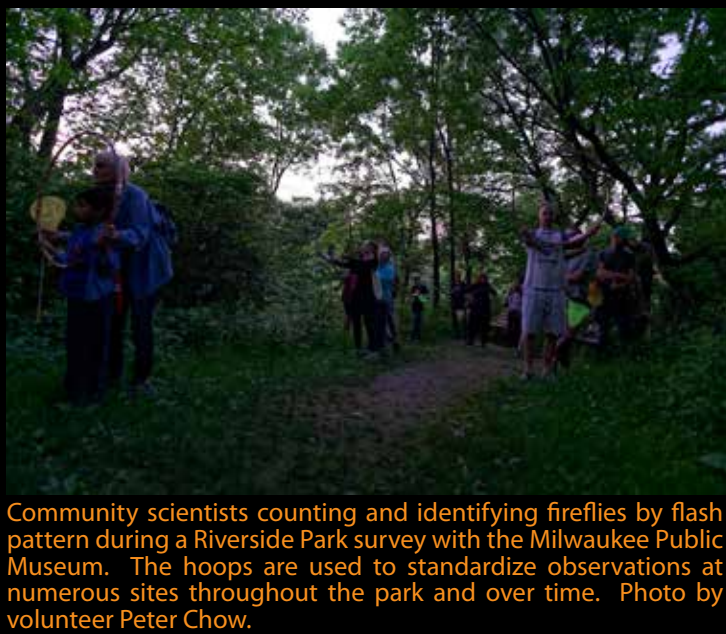
Dr. Yahnke's long-term bat monitoring station comparison revealed high UEC bat activity compared to sites in central and northern Wisconsin, even with the spread of white-nose syndrome. In part this is due to different assemblages of species in southeastern Wisconsin, with a distinct EPFU (*Eptesicus fuscus* or big brown bat) presence — the urban habitat dweller often encountered on acoustic bat surveys.



Evening bat surveys are also the perfect time to listen for breeding frogs and singing insects or count fireflies!

On September 6, 2018 community scientists heard the [Morse code-like song](#) of the greater angle-wing katydid. After this species and others appeared to be in decline in the Eastern U.S., community scientists mobilized surveys specifically in urban areas. "By extending these surveys to the Midwest, we can monitor these species in another part of their native range. Furthermore, the presence of these species at the Urban Ecology Center locations suggests that habitat is sufficient to support their populations (e.g., habitat quality and extent/size), even in an urban environment." UW-Parkside Assistant Professor Dr. Jessica Orlofske

After sunset, Urban Ecology Center greenspaces take on an entirely different feel as nocturnal animals take the stage



Community scientists counting and identifying fireflies by flash pattern during a Riverside Park survey with the Milwaukee Public Museum. The hoops are used to standardize observations at numerous sites throughout the park and over time. Photo by volunteer Peter Chow.

INTERESTING INVERTEBRATES:

Monarchs continue to be the focus of butterfly research at the Urban Ecology Center because their decline over recent decades has caused a sense of urgency to better understand and conserve their unique international and multigenerational migration route. Community scientists contribute to the monitoring of monarch eggs and larval caterpillars as well as the “super generation” of adult monarch butterflies as they begin their migration to Mexico each fall.

Monarch Egg and Larva Monitoring



A year in the life of a monarch includes [multiple generations sequentially completing a single migration journey](#), and it all starts with an egg. Monarchs arrive in Milwaukee in late spring and begin a summer-long breeding season where each new generation is born, metamorphoses, reproduces, and dies. In fall the final generation will return to Mexico—the same mountains their great-great-grandparents overwintered the year before.

It all starts with an egg. In this case, multiple eggs laid on a single common milkweed leaf. Photo taken July 25, 2017 by Menomonee Valley Research and Community Science intern Xeng Xiong.



The 2018 season had high numbers of eggs and larvae observed at all three branches, including an Urban Ecology Center record-breaking survey at Riverside Park on June 28, 2018 with 134 eggs and 10 larvae observed on 101 milkweed plants!

Menomonee Valley had its own record of 19 larvae observed on 105 milkweed plants on August 14, 2018 and a week later a record 51 eggs were observed on 104 milkweed plants. Washington Park had its second highest number of eggs (59 on 102 milkweed plants) observed on June 25, 2018 and second highest occurrence of larvae (16 on 132 plants) on July 16, 2018. These data indicate both population-level conservation efforts and local successes of land stewardship in Urban Ecology Center greenspaces.



Monarch Tagging

Community scientists tag the last generation of monarchs in September. Each butterfly's tag has a unique identification number and instructions on how to record the data if it is seen again, either during migration or while overwintering in Mexico. Tag purchases help fund efforts by local community members in Mexico to collect monarch data and contribute to international monarch conservation.

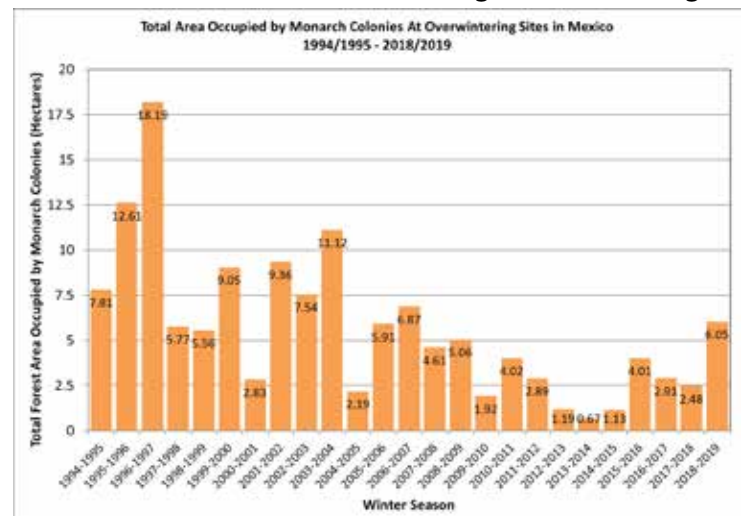


Photo by community scientist Bruce Halmo at Riverside Park August 10, 2018.

Larval monarch caterpillars rely solely on native milkweed for food, habitat, and protection from predators (they absorb toxic compounds from the plant that makes them unpalatable to predators throughout their entire lives).

Monarch populations require diverse native plants used as nectar sources staggered throughout the summer breeding season and along their entire 2,000+ mile migration route. These same plants also support a variety of other native insect pollinators such as bees.

Local efforts to increase diverse native plants are paying off. The 2018 – 2019 season is the first time since 2006 – 2007 that the population area is higher than six hectares—the target for a sustained population that can recover from climate events and large-scale challenges.



Graph by Monarch Joint Venture showing the total area of forest area with overwintering monarchs over 25 years.

BUTTERFLIES, BEETLES, & BEES

Bees



Photo by community scientist Bruce Halmo.

Like monarchs, native bees are also in decline and are gaining national attention as conservation becomes vital for their survival—and ours. The pollination that bees provide for both native flowering plants, forests, and human crops are unparalleled. And there is good news. Urban areas are emerging as hotspots for pollinators because of the diversity of native plants in home gardens and public greenspaces like those at the Center!

Native bees are the most effective pollinators in the environment—including our home vegetable gardens. Unlike the introduced honey bees, bumble bees can buzz pollinate using high frequency vibrations to release pollen like a secret password. With hairy bodies adapted to cooler temperatures, they depend on a continuum of flowering plants from early spring through late fall, along with ground cover habitat, to nest and overwinter.

First rusty patched bumble bee spotted in Riverside Park



On August 2, 2018 community scientists documented a rusty patched bumble bee for the first time in any of the three Urban Ecology Center greenspaces! Riverside Park is now officially home to a new federally endangered species. This sighting is particularly cool because the female was spotted in the most recently restored

area of the Arboretum! Six additional species were also confirmed in Riverside Park in 2018: yellow bumble bee, black and gold bumble bee, two-spotted bumble bee, brown-belted bumble bee, common Eastern bumble bee, and red-belted bumble bee.



Photos of community scientists photographing bees in Riverside Park July 5, 2018. UW-Extension Master Gardener Jennifer Lazewski (bottom) took us under her wing to mentor staff and community scientists on identifying bumble bees--and photographed our first rusty patched bumble bee!

Beetles

Beetles are among the newest taxa monitored in the Menomonee Valley—and it is entirely community led and driven. Community scientists Jon Bales and Heidi Meier look in vegetation, decomposing wood, and even scat. After finding beetles in the field, they bring them back to the lab to begin identifying representatives of the largest group of animals on earth!

“Beetles are amazing. My favorite aspect of learning about beetles is identifying them, discovering their life story, and communicating with entomologists on expanding local data...”
—Community scientist and project leader Heidi Meier



“I collected beetles as a youngster, and the Urban Ecology Center has me reliving my youth... There are 115 families and thousands of different species of beetles right here in Milwaukee...”
—Community scientist and project leader Jon Bales

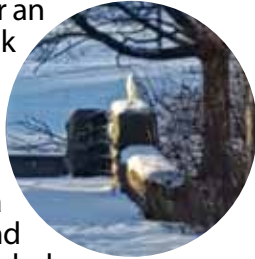


Co-leaders Jon Bales and Heidi Meier led 9 surveys with volunteers April – October 2018 where they collected beetles and brought them back to the Center to identify. They even found beetles that haven't been recorded in the region before and are contributing knowledge about the diversity of life inhabiting these restored urban greenspaces.

WEEKLY BIRD WALKS



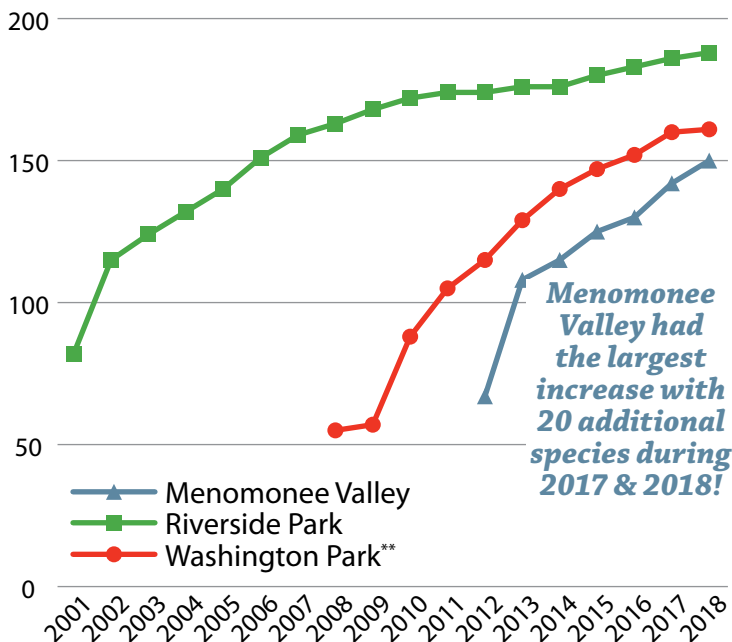
Kick-start your day with fresh air and bird songs! Community scientists meet year round for [Weekly Bird Walks](#) at each of the three Urban Ecology Centers for an early morning walk to document bird species and population trends. Community scientists contributed 7,266 hours of birding in 2017 & 2018. New species such as a hoary redpoll and snowy owls were added to the UEC's cumulative checklist. Habitat specialists such as an eastern bluebird and a Wilson's snipe were observed in the ephemeral ponds of Riverside and Washington Park. Community scientists also documented unusual migration timing for [Nashville warblers](#) and [red-winged blackbirds](#).



2017 & 2018 additions increased the cumulative list to 203 species

Cumulative bird species richness

Total number of species* documented based on 1,700 checklists (weekly walks and casual observations)



*Includes subspecies included in eBird taxonomy at time of analysis

**Washington park checklists were occasional before 2010

Clockwise from top: hoary redpoll by community scientist Charlotte R. Catalano, snowy owl by UEC educator Tory Bahe, and eastern bluebird by community scientist Bruce Halmo.

Poem written by Anne Bales (right) January 11, 2018 in Urban Echo Poets, a monthly nature-themed poetry-writing program at the Center. Since 2005, Anne has been a regular community science volunteer on Weekly Bird Walks and a patient teacher in the science of listening (and identifying) birds by ear! Photo by Matt Unrau.



When Everything Began

*Everything began with a bird walk
in Riverside Park
in winter,
January, 2005.*

*After everything began then
my life changed
my world changed.
I stepped into nature
with both feet,
then,
in January 2005
on icy paths along the river.*

*I was an extreme beginner then
I didn't know one bird from another,
not by sight,
not by sound,
except for robins, cardinals, pigeons.*

*Slowly, slowly everything began to
come into focus with a
Mother's Day gift,
good enough binoculars,
and time.*

*I also listened more closely to
the sounds,
learned to distinguish,
really hear the birds.*

*Everything that began with a walk
along the river,
that cold, icy January day
began to make sense
and grew as the days grew longer.*

*In March the Red-Winged Blackbirds
returned. It was spring, warmer.
Everyone was happy for these
particular migrants.
For fun we took bets on the
exact date of their arrival.*

*When everything began,
birds took hold
of my brain,
of my life,
even of my soul.*

*I could no longer go back again to
before everything began with
that first bird walk,
January, 2005.*

—by Anne Bales



Bird photos (top to bottom: great horned owl, American redstart, and blue-winged teal) by community scientist Bruce Halmo at Riverside Park in 2018.

BIRD BANDING

Urban Ecology Center bird banding monitors songbirds during spring and fall migration. Supported by a team of trained banders (both staff and community scientists) and professional partners, we support educational opportunities for school groups and community members to learn more about birds by directly observing and participating in the research process.

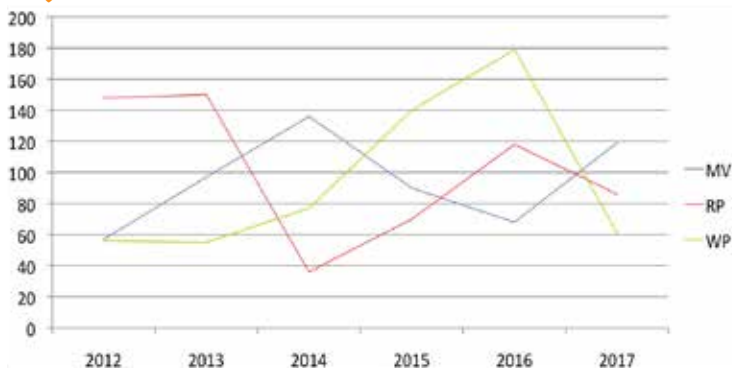


Bird banding is one of the Urban Ecology Center's longest running monitoring projects. Bird banding is a useful research tool to increase understanding about bird dispersal and migration, behavior and social structure, life span, population dynamics, survival and productivity, and toxicology and disease. [Learn more from community scientists in this video.](#)

A Canada warbler held securely and safely by a qualified bander at Riverside Park. Attaching a lightweight band with a unique code to one of the legs aids conservation research: should it be recaptured at this or another banding station, we are able to better understand migratory habitats, habitat requirements, and longevity of a species. Caption and photo by community scientist Charlotte R. Catalano.



By the numbers: total birds banded



For the first time in 2018, community scientists looked at the longitudinal banding data set and integrated historical context into the data. For example, the steep drop in 2014 at Riverside Park might be explained by both a drop in effort as banding spread to two new locations as well as the disturbance of construction of the Arboretum and smothering of river flat invasive species. In Washington Park, an extra banding session better aligned with migration during the 2016 spring season accounted for numerous species not usually banded, including 11 northern waterthrushes.

Recaptures provide valuable insights on migration patterns, local habitat health, and better species-specific field observations

A recapture is any bird captured already wearing a band, including:

- Birds banded elsewhere and recaptured at the UEC
- Migrants following the same pattern year after year
- Breeding migrants
- Resident birds that stay here year round



Recapture photos (top to bottom: downy woodpecker and northern cardinal) taken by community scientist Bruce Halmo at Riverside Park in 2017.



Community scientist (and photographer) Bruce Halmo sighted a northern cardinal on December 8, 2017 with a band. We traced it back to #123511850, banded in Riverside Park on May 19, 2016! That means this resident bird survived the winter of 2017 (and other triumphs and tribulations along the way). Moreover, we know that he was probably born in 2014 because of what his plumage looked like when we banded him. Recaptured birds truly have incredible stories.

This page was adapted from a presentation by GIS and Field Data Coordinator Jessica Orlando and community scientist Diane Weaver: *Bird Banding at the Urban Ecology Center What a Sliver of our Data Tells Us* presented at Milwaukee's Brew City Birding Festival in May 2018. Featured in May's Volunteer Spotlight, Diane (right) volunteered a grand total of 222 hours at all three UEC branches in 2017 alone! She's involved in numerous community science projects, notably odonate monitoring and her many leadership roles within our bird banding project. This includes representing the Center at meetings with partners, entering and quality assurance of all bird banding data, translating raw data into the format needed for the USGS Bird Banding Lab database, analyzing data and presenting results. Diane's attention to detail is incredibly valuable to stewarding the bird banding dataset—one of the longest running research projects at the Center (since 2002!)



WATER QUALITY

“ I had no idea what an ephemeral pond was or that we had one in Washington Park until this project. All the times I’ve been in this park (and I can assure you, I come here fairly often), I’ve only associated that space as an empty, rough-hewn ditch with buckthorn creeping around here and there (I’d like to think that we’ve since dealt with the buckthorn, but you never know with invasives). But there it was, an empty, rough-hewn ditch filled with water. Or at least, that’s the impression you’d get in the first few weeks of the surveys. It was...a bit of a slow start. Then came the frogs. American Bullfrogs here for spring vacation, my guess is that they took their time packing their bags. While I imagine the frogs didn’t find the funnel traps to be 5-star accommodations, it was certainly an exciting turning point in our findings. There was life in this seemingly empty body of water! Actually, there was more than just what we found in the traps. There were invertebrates, but they are nigh-impossible to tell apart in my eyes, even if my eyes were as powerful as microscopes. Other honorable mentions include a pair of ducks, an overly-enthusiastic dog, and I guess I could count myself, too...After all that time, the frogs seemed to give us purpose in what we were doing. Even though the American bullfrogs aren’t too picky about water quality, they were a very clear indicator of life in the pond...And that was enough.



Life seems to find a way back into anything. The ephemeral ponds were originally lily ponds, a glimpse into this park’s past as West Park and previous home of the Milwaukee County Zoo. While the pond’s primary in-flow valve was shut off years ago, winter snow melt and spring rains continued to fill the pond with water. By mid-July, the rainwater is sucked into the soil transitioning the pond into a moist meadow of sedges and flowering forbs. Despite first being built for aesthetic appeal and later abandoned, life picked up the pieces and made something else. If we were all to suddenly disappear, would the same thing happen? It presents an interesting idea, and I’m grateful to the survey (and the frogs) for showing this to me.”

—by Urban Ecology Center outdoor leader and Escuela Verde graduate Gustav Kramer who monitored the Washington Park ephemeral ponds as part of the Milwaukee County Parks wetland monitoring program.

Water Quality Monitoring of Menomonee Valley Ponds

The purpose of this monitoring study is to determine the efficacy of different systems of stormwater management. Samples were taken from six ephemeral ponds and one traditional stormwater pond.



One of the ponds, Dragonfly Pond, was designed to filter stormwater from the surrounding area via a series of pumps and cisterns, and then release the filtered water through more pumps into the Menomonee River. The second group of ponds in this study are the interconnected Stormwater Park ponds designed to filter stormwater passively, with stormwater flowing from pond to pond and water quality theoretically improving as distance to the Menomonee River decreases. Lastly, one retention pond near Miller Park is included in the study as a traditional example of a stormwater management pond.



“I’ve been an Outdoor Leader and Intern since Three Bridges Park’s opening, so this project is very near and dear to my heart” —Richard Imp, 2018 Research & Community Science Intern

•How do the built ponds of Stormwater Park differ from the more traditional retention ponds (e.g., Miller Park)?

•Is the Menomonee Valley functioning as it originally did as a wetland of biological filtration before water reaches Lake Michigan?

—by 2018 Menomonee Valley Research and Community Science Interns Richard Imp and Maggie Steinhauer



ODONATES



Odonate monitoring began at the request of the Wisconsin Dragonfly Society to increase survey efforts in underrepresented southeastern Wisconsin and to engage urban communities. The Research and Community Science program complements the society's mission to study and protect the dragonflies and damselflies in Wisconsin and foster appreciation, study, and enjoyment of these species and the aquatic habitats they depend on.



Dragonflies? More like dragonswims!



Urban Ecology Center outdoor leader Gustav Kramer couldn't have said it better when he proclaimed them dragon-swims during a wetland monitoring survey. Most non-migratory dragonflies

and damselflies actually spend the majority of their life cycles as eggs and larval nymphs (1 – 4 years) within aquatic habitats such as rivers, lakes, and ponds. It isn't until the very end of their lives that they metamorphose into adults and emerge from aquatic nurseries. Adults live only a short time during their flight season (about 1 month), which is long enough to reproduce



and continue the next generation. Because the aquatic larvae of many dragonfly and damselfly species are sensitive to pollution, their presence can indicate good or improving water quality.



A citrine forktail—one of the smallest and rarest odonate species in the United States—photographed September 20, 2018 at Menomonee Valley. Unlike most damselflies and dragonflies, the females mate just once and store the sperm for future egg fertilization. The mating behavior of the citrine forktail is rarely seen and very little studied because it is such a rare species. We still have so much to learn about this beautiful creature!

On September 20, 2018 community scientists documented a rare damselfly species in Three Bridges Park. The citrine forktail, considered a rare species in the state, is often only documented once or twice a year in Wisconsin—and these were the only two observations in the Wisconsin Odonata Survey since 2015! It was a particularly exciting find because this documentation represents a rare odonate species documented in our actively managed shared greenspaces. Without our community scientists, we would not know of these species.



Additional first-time observations were a southern spreadwing documented at Menomonee Valley on June 6, 2017, a rainbow bluet observed at Menomonee Valley on July 5, 2017, a taiga bluet and emerald spreadwing documented May 30, 2018 at Washington Park, and an azure bluet at Menomonee Valley on July 4, 2018.



Photos documenting first-time odonate observations (clockwise from top): Washington Park emerald spreadwing, Menomonee Valley rainbow bluet, and Washington Park taiga bluet.

EVENTS

Green Birding Challenge & Brew City Birding Festival

We hosted the first-ever Brew City Birding Festival in 2017, a county-wide celebration of resident and migratory birds. Volunteers led bird banding demonstrations, took turns recording every bird they saw for an all-day big sit, led family-friendly activity stations during the Green Birding Challenge, taught evening bird lectures on flycatcher identification,

ornithology, raptors, and feathers, and showed off bird watching hotspots and restoration initiatives by leading field trips throughout Milwaukee! The event continued in 2018 and both weeks culminated in the Green Birding Challenge, a community science event and fundraiser eight years running.

“My husband Jonathan and I have participated in the Green Birding Challenge for the past three years. I love the event not only because it’s fun, but because it supports the work of the Urban Ecology Center, a place we visit frequently. If you spend time moving around the city as the GBC encourages—slowly, looking and listening for the city’s non-human inhabitants—you’ll notice them at other times too, and be inspired to protect them.”
—Brittany Pladek, participant

\$27,000 raised for community science in 2017 & 2018

The Green Birding Challenge isn’t just fun, it’s also the best way to support community science programming. Funds from this fossil-fuel free event go to support such programs as bird banding, odonate monitoring, and firefly research. These unique projects are some of the only kind in the state and have helped document the presence of numerous species throughout Milwaukee.

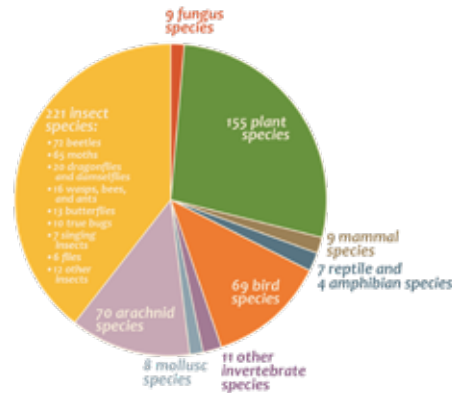


BioBlitzes



In summer 2018 the Research and Community Science team was asked to do what it does best: survey local ecology alongside the community—and to bring those skills to Chambers Island in Door County, Wisconsin.

A team of 32 species specialists and 70 volunteers searched the woods and wetlands to inventory the island’s biodiversity, creating a database as a solid foundation for future studies and adding to previous work. What did they find? 563 species of plants and animals were documented, including species never documented on the Island or even on the County’s mainland!



“What a great way for the community to appreciate, discover, and get involved in preserving Door County’s special places.”
—Tom Clay

Eco-travel

The Research and Community Science team goes beyond Milwaukee a few times per year to connect the community with new places. These include destinations close to home such as the other side of our own Lake Michigan watershed as well as international destinations that highlight unique ecology, geology, or sustainability.



Regardless of the destination, Eco-travel exemplifies the same focus on nature, education, community and fun that informs everything we do. In 2017 & 2018 the Research and Community Science team led trips to explore tropical biology in Costa Rica, sand dunes on the sunset side of Lake Michigan, the Prairie Pothole Region of North Dakota, and the glaciers and volcanos of Iceland!



2017 & 2018 COMMUNITY SCIENTISTS

Thank you to the 473 individuals and organizations who volunteered over 8,200 hours of their time and talents to Research and Community Science at the Urban Ecology Center in 2017 & 2018!

Our volunteers are the heart of our organization. You help keep the daily workings of the Center going and make it fun while it's happening. Here are 5 awards that we feel you all deserve:

1) The Workhorse Award: Our volunteers help our department run 365 programs per year! This doesn't even take into account the events, field trips, and programs our department runs that you also often attend. These programs are only able to run when we have volunteer assistance. That's a lot of help from some dedicated volunteers!

2) The Long Hours Award: Ok, we admit it. The volunteer hours required to help with Community Science programs can be brutal. Whether it is bird banding at 5:00 am or recording bat calls at 10:00 pm, we can rely on you to be there. That feels pretty good.

3) The Loyalty Award: In 2017-2018, out of nearly 1,200 volunteers who volunteered individually (not with a group), 1/6 of their time was spent volunteering for Community Science programs! In fact, volunteers only spent more time volunteering in one other area. That means we have a lot of individual volunteers doing a lot of work to help our department. We are humbled by and thankful for this statistic as we think the research and monitoring that we do in the parks is pretty important. We are happy to know that many of you value these opportunities too.

4) The Light at the End of the Tunnel Award: Research days often start early and end late, and come with challenging work conditions for staff. Volunteers bring laughter and smiles, giving us energy and a figurative "light at the end of our tunnel" on those long days. We can't appreciate you enough. Our work would not be as fun or engaging without you. Thank you for your endless enthusiasm and your ability to remind us of how exciting this work is for our community.

5) Nothing Fazes You Award: Get bird poop flung on your face? Walk through clouds of biting mosquitoes? Help with a program on a 95 degree day? Bird walk when when it's -15 degrees? Get your new boots caked with mud while counting monarchs? Wake up at 3:30 am to make sandwiches for banding? Carry 25 pounds of field equipment while swatting at mosquitoes while it's 95 degrees? Meh. Ain't no thang. You act as if these every-day requests truly don't faze you. We notice those exceptional things you do and hope you know it means the world to us.



*"I originally aimed to photograph goldfinches in the Riverside Park oak savanna when the hummingbird caught my eye. Associating the fast fliers with red or bell-shaped flowers, I did not expect the bird to repeatedly visit cup plant (*Silphium perfoliatum*), a yellow composite flower. For several evenings, I came to this local, urban park, observing and photographing the hungry birds. My patient efforts paid off when I reviewed my images and found the hummingbird frozen midflight against the evening sky. August 2018.*

I got started volunteering at the Urban Ecology Center through small mammal monitoring in the summer of 2012 and have been fortunate enough to help with that project at least a few times every summer since, alongside numerous other projects. These opportunities and the UEC have helped me get to where I am professionally, granted me steady friendships, taught me so very much, and most importantly, welcomed me, enthusiastic quirks and all, with open arms.

Holding both a degree in Art and Wildlife Ecology, I work to combine my two passions through wildlife and nature photography. The photographic platform allows me to take my experiences and understanding of animals to a different level, giving me the ability to introduce others to the way wildlife live and exist in our world today."—Community Scientist Charlotte R. Catalano.

Find this document online at:

urbanecologycenter.org/researchandcommunitysciencereviews



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