University of Wisconsin-Madison
Facilities Planning & Management
Lakeshore Nature Preserve

E-Newsletter

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A Message from the Director...

By Gary Brown, PLA, FASLA

Happy New Year!

This issue celebrates the teaching and research use of the Preserve featuring 2021 Student Engagement Grant projects and others.

The Lakeshore Nature Preserve's mission is to support the teaching and research mission of the UW as well as provide opportunities for respite and well-being. The Preserve continues to be an important place to access nature for the university and greater Madison community. In 2021, the Preserve's visitor counter recorded 138,831 people walking the main path towards the tip of Picnic Point. This is the traditional route most people take in the Preserve to enjoy the views of Lake Mendota and the downtown and campus skylines. If you are in the Madison area, we encourage you to explore other portions of the 300-acre Preserve during the new year. Visit our website's Plan a Visit or Places in the Preserve pages or join one of the Friends of the Lakeshore Nature Preserve field trips.

Thank you for your continued support. You have helped us raise needed funds to continue the management and ecological restoration of Preserve lands as well as to hire seasonal and student field technicians.

We continue to work with our consultant on the Preserve Master Plan Update. We are continuing to collect information from our campus partners and neighbors to help form the recommendations that will be discussed at the next Public Meeting in early March 2022. Please watch your email or the Preserve website for an announcement. We'd love to have your involvement.

Lastly, we continue to implement strategies developed in the 2020-2030 Strategic Plan including updating the Preserve's branding to better reflect that it is an integral part of the UW campus (it makes up roughly 1/3 of the campus landscape after all). As a result, future issues of this newsletter and communications from the Preserve will look a little different as we retire our blue and green logo and adopt the UW crest logo as shown below.

Lakeshore Nature Preserve
FACILITIES PLANNING & MANAGEMENT
UNIVERSITY OF WISCONSIN–MADISON

Adam Gundlach


Bryce Richter/UW-Madison

Student Engagement Grants Fund Undergraduate Student Hands-on Experience

By Laura Wyatt, Preserve Program Manager

Each year the Lakeshore Nature Preserve Committee awards several Student Engagement Grants of up to $1,000 each to facilitate the use of the Preserve as a resource for education among UW-Madison undergraduates. Any student, faculty, or staff member may apply. **Requests for proposals are due March 1, 2022.**

This small grant opportunity provides funding for undergraduates to get hands-on research experience. Funding can be used to purchase equipment or to provide student stipends. In addition, students are expected to present their project to the Preserve Committee and are highly encouraged to present their findings at an appropriate venue such as a conference or the undergraduate research symposium. **This year we asked recipients to provide project summaries for our newsletter which you can read on the following pages.**

Since 2014 the Preserve Committee has awarded a total of $24,912 to 26 projects, impacting 695 students. **Learn more and view the request for proposals on the Preserve website.**

The grants are made possible by the Academic Endowment Fund of the Preserve, established by former UW faculty member Robert M. Goodman and the late Professor Henry Hart. To contribute to the Academic Fund to create more opportunities for undergraduates to engage in learning in the Preserve, please contact the Preserve Program Manager at laura.wyatt@wisc.edu or 608-265-9275.

Wind and Insect Pollinated Plant's Microbiological Interaction with Honey Bees

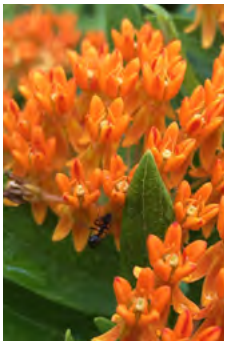
By Claire Reichardt, Student Engagement Grant recipient and Genetics and Environmental Studies undergraduate student

My research project investigates how bacteria isolated from pollen differed in insect and wind pollinated plants and how they benefit honey bees. I specifically targeted a type of bacteria called actinobacteria, a gram-positive bacterium most often found in soils that are used to create a large portion of the world's antibiotics. I compared how well bacteria from wind pollinated plants vs. insect pollinated plants prevented common honey bee pathogens.

Both domestic and wild honey bee populations have been drastically decreasing due to habitat loss, decreased biodiversity, and increased spread of honey bee pathogens. My research aims to find a solution to rapidly declining honey bee hives through natural solutions. Bacteria isolated in my study were tested against several plant and honey bee pathogens to better understand the symbiotic relationship actinobacteria have with plants and their pollinators.

I used the Lakeshore Nature Preserve to collect 100 samples of pollen from insect and wind pollinated plants for this research. The pollen collected produced roughly 70 desirable bacteria strains that we used to test against common honey bee pathogens. The results showed that wind pollinated plants produces the most actinobacteria, and they are also the most successful in preventing pathogenic microbes. However, I concluded that bacteria from pollen is a viable source for potential honey bee antibiotics, no matter the type of pollination the plants receive in their native habitat.

My research continues as I further investigate the tripartite symbiosis between plants, actinobacteria, and honey bees and how I can use their natural antimicrobial abilities to recover honey bee populations. The Lakeshore Nature Preserve Student Engagement Grant has given me the opportunity to research the specificity and importance of a native ecosystem's microbiological interactions.



Claire Reichardt

Reichardt compared bacteria from wind pollinated plants (like Canada wild rye) and insect pollinated plants (like butterfly weed) to see which prevented common honey bee pathogens.


Claire Reichardt

Reichardt cultured actinobacteria from 100 pollen samples producing roughly 70 desireable bacteria strains used to test against honey bee pathogens.

Stormwater and Green Infrastructures within the Preserve

By Cole Koffron, Student Engagement Grant recipient and Environmental Sciences undergraduate student

It is no secret that for a considerable part of the summer it is possible that you will be warned about swimming in our Lake Mendota due to the proliferation of cyanobacteria. This effect is largely due to high concentrations of phosphorus and nitrogen loaded into the lake from agricultural and urban runoff. On the urban side of the issue, the university in conjunction with the city has taken many steps to reduce this impact on the lake. These efforts include the construction and implementation of green infrastructures such as porous pavement aimed at reducing the amount of pollution that reaches the lake. We are conducting a study to aid in these efforts and understand the interaction between green infrastructure and their impact on the watershed.

The first goal of the project included sampling storm-water generated by the landscaped portions of campus and delivered to shores of Lake Mendota through storm-sewers, and then comparing those values to natural runoff from Frautschi Point in the Lakeshore Nature Preserve. Although idle through the early summer drought, the numerous nighttime storms more than made up for that lack of excitement. Water samples were analyzed at the UW-Stevens Point Water Lab for various pollutants. Concurrently, we tested the infiltration capacity and dynamics of four porous pavement areas on university lands and within the Preserve. Recently project work has shifted to using various hydrologic modeling programs and land information systems to identify areas within the university that could benefit from additional green infrastructures. I eagerly await the last of the lab results to put together our findings in the hope that this project contributes to a better understanding of university stormwater management which can help alleviate the water quality problems affecting the shores of our beautiful Lakeshore Nature Preserve.

Koffron compared runoff between traditionally landscaped and natural area portions of campus. He also tested infiltration capacity of porous pavement areas on campus.

Student Composting in Eagle Heights Gardens

By Ava Padilla, Student Engagement Grant recipient and Botany and Environmental Studies undergraduate student

This Lakeshore Nature Preserve Student Engagement grant was used to fund the construction of a new compost site to be used by students, especially in collaboration with F.H. King Students for Sustainable Agriculture. The project included the deconstruction of the previous composting site, returning that land to the care of the Lakeshore Nature Preserve, and constructing two new types of composting systems with improved ease of management. The previous composting site was in a less accessible site and was not suitable to long-term sustainable management. The new site includes both a concrete block composter and wood & wire bins, allowing for more opportunities for students to engage with different composting methods.

The labor involved in all processes was aided by undergraduate students associated with the F.H. King summer internship, along with undergraduate and graduate student volunteers actively engaged within the Eagle Heights community. Collaboration with UW Landscape Architect Rhonda James and UW-Madison Grounds staff was also essential to this process.

Over the summer, the compost site was used as a part of the educational curriculum for the F.H. King student internship. The Full Cycle Freight program, also managed by F.H. King, made use of the new structure as a drop off site for locally collected compost, connecting students to community and broadening awareness of local waste systems.

As leader of this compost project, I led a compost workshop for F.H. King students to cover the basics of composting. Through project advisor Dr. Tom Bryan, the site is also accessible for students in the Greenhouse Learning Community. Working within the Lakeshore Nature Preserve, alongside knowledgeable staff is what made the compost project achievable.

F.H. King volunteers and project lead construct the first segment of the compost block composter.

Project lead Ava Padilla poses with the wood and wire compost bins.

Wild and Domestic Canid Activity in the Lakeshore Nature Preserve

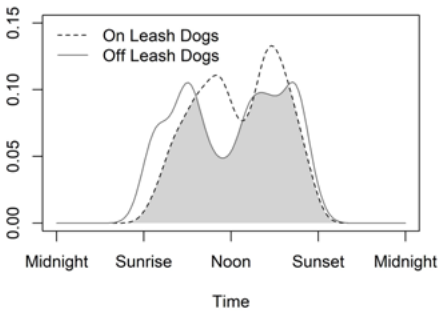
By Ali Thompson (Student Engagement Grant recipient and Zoology and Psychology undergraduate student), Morgan Farmer (PhD student, Dept of Forest and Wildlife Ecology), and David Drake (Extension Wildlife Specialist and Professor, Dept of Forest and Wildlife Ecology)

Little research has been conducted on the impact that off versus on-leash dogs may have on wildlife despite the growing concern for potential impacts on wildlife in protected areas. Off-leash dogs in the Lakeshore Nature Preserve may alter red fox and coyote behavior or activity, and humans and dogs encountering a fox or coyote may result in human-wildlife conflict. Following a dog-fox/coyote interaction, it is not uncommon for dog owners, and eventually the general public, to become less tolerant of urban wild canids, especially if the incident occurs with a coyote. Additionally, dogs interacting with wild canids may lead to transmission of a variety of diseases such as rabies, parvovirus, and canine distemper. Furthermore, harassment of wildlife, like foxes and coyotes, may have negative effects on individuals and even whole populations, and similarly, interactions with off-leash dogs may detract from other visitors' experience. Though there is already signage regarding leash requirements within the Preserve, anecdotal evidence suggests that some dog owners are not abiding by these rules.

As such, our project aimed to track patterns of domestic dog activity, differentiating between on and off-leash dogs, and red fox and coyote activity in the Preserve. We collected data using motion-activated camera traps (purchased with grant money) to determine how abundant dogs are, how many are on versus off-leash, which times have the most dog activity, and if these indicate potential interference with red foxes and coyotes. Two camera traps were rotated to new sites every two weeks, covering a total of six sites near trail intersections.

In addition to the camera trapping, we conducted outreach on four days between July 19 and July 24, 2021. All outreach was done in the morning outside of the Picnic Point entrance with dog treats and handouts explaining the importance of the leash policy and some general information on foxes and coyotes. One morning we also visited the entrances to Frautschi Point and Raymer's Cove, but concluded at the Picnic Point entrance where there was more activity. We talked to approximately 60 people over the four days—25 were not accompanied by dogs, 35 had a dog on leash, and 2 people had an off-leash dog. In general, responses from the public were positive and encouraging. Most people agreed that off-leash dogs in the Preserve can be a major problem and that most cases seem to be a handful of repeat offenders. Visitors were interested to hear about our work in the Preserve and supported the leash policy.

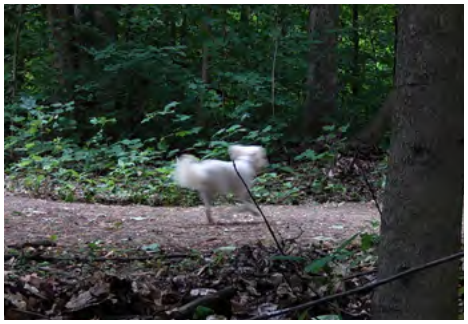
To determine whether there are specific times of day which have higher domestic dog activity, we calculated $\hat{D}$, a measure of temporal overlap that ranges from 0 (no temporal overlap) to 1 (complete temporal overlap), and built kernel density plots based on the detection data from the camera traps. We have seen a high temporal overlap between on and off-leash dogs ($\hat{D}$= 0.821), indicating that there are not specific times when people are more likely to have an off-leash dog than an on-leash dog in the Preserve. This indicates an increase in potential conflict between off and on-leash dogs, resulting in potentially hazardous conditions for some dogs and humans. Some dogs may be dog reactive and will behave appropriately while on-leash, but may react aggressively if approached by an off-leash dog.



The graph shows the temporal distribution of on and off leash dogs. The shaded area is that of overlap between the two groups. The y-axis displays the density, indicating the percentage of a given group that is active during the corresponding time period. For example, roughly 10% of off-leash dogs detections are between sunrise and noon.

Bryn Scriver

Thompson and Farmer greet a dog owner at the Preserve as part of their outreach efforts.



Photos and graph provided by the authors

Examples of canids caught on the study camera traps in the Lakeshore Nature Preserve (from top to bottom): an off-leash dog, a red fox with a collar previously attached as part of the UW Urban Canid Project, and a coyote.

Female Common Mergansers paddle on Lake Mendota

Audubon Society at UW-Madison Beginning Birdwatching Educational Series

By Cole Roeker, Audubon Society at UW-Madison, Student Engagement Grant recipient, and History, English, and French undergraduate student

This fall, the Audubon Society at UW-Madison hosted a guided birdwatching hike series every Saturday at the Lakeshore Nature Preserve. Geared toward students who had not previously tried birdwatching, our goal was to use "birding" as means to encourage students to pay more attention to the birds all around them on campus, and by extension, to the natural world in which they live. Our hikes took us throughout the Preserve, observing many species as they migrated southward through Wisconsin, all the while teaching over 150 students how to identify specific avian species through sight and song. In order to make this educational series possible, we relied on the generous grant provided by the Preserve to purchase a set of 14 binoculars for use by students who did not have their own. What tends to be the greatest barrier to birdwatching is access to binoculars, which are key to helping us observe and enjoy birds from a distance as they fly between trees. The Lakeshore Nature Preserve Student Engagement Grant allowed us to greatly expand the amount of students we could reach by providing binoculars for use, thereby overcoming this barrier.

Top: A flock of warblers attracts the eyes (and cranes the necks) of beginning birdwatchers on October 23, 2021.

Bottom: Students watch a flock of Black-capped Chickadees and Kinglets near Biocore Prairie on November 20, 2021.

One hundred and fifty students attended our hike series through the fall. Due to the number of binoculars and having only two experienced guides to lead each hike, weekly sessions were limited to 15 attendees. A sign-up sheet was sent out to our email list each Thursday beforehand, with the first sign-up sheet filling in less than 10 minutes. This was a remarkable amount of interest, as our hikes in the previous year usually only attracted between 3-5 students. Our organization email list grew from 45 students to 262, and our number of regularly engaged members has grown from 8-10 to nearly 40. Our organization group chat often exchanges messages about campus birds, conservation politics, and environmental events. Our initial goal to attract more students to birds and conservation was easily met; much of our new membership first joined us on these hikes, and they now engage daily with bird news, campus natural areas, and environmental politics. We are excited to see where our newfound growth takes us and which new conservation projects we will undertake in future years.

Our success must be attributed to the support we received throughout the semester. Thank you again to the Lakeshore Nature Preserve for providing us with this extremely important grant, to Professor Jim Berkelman, Professor Karie Cherwin, and Professor Jamie Nack for helping to advertise our hike series during their classes, and to our advisor, Dr. Anna Pidgeon, for all of her guidance before and during our educational hike series. An important additional research outcome of our series was the complete and regular documentation of the birds we identified in the Preserve using eBird. This has given us a regular set of data which we hope to study and compare to future migratory seasons in the Preserve. One of our members is currently developing a computational method through which we can analyze this data. We look forward to hosting many more guided bird hikes at the Lakeshore Nature Preserve and to exposing more UW students to the wonderful world of birds and the environment. You can learn more about our organization and our work by contacting us at audubonsocietyuw@gmail.com.

TEACHING AND RESEARCH BY THE NUMBERS

In 2021, 55 teaching/research permits plus 23 continuing long-term permits were issued to 19 UW departments & programs, 3 government entities, and 5 community organizations.

In other teaching and research news...

Student Develops Fungi Brochure for Lakeshore Nature Preserve

By Naamon Peyton, Microbiology undergraduate student, Mercile J. Lee Scholar, and Undergraduate Research Scholar

I created a brochure about the fungi of the Lakeshore Nature Preserve at the suggestion of Dr. Anne Pringle and PhD student Savannah Gentry as a culmination of a project in UW's Undergraduate Research Scholars program in the fall of my freshman year. The project was perfect for me because I have been interested in fungi since my sophomore year of high school, and I already intended to find out what fungi were present on the UW-Madison campus.

In the process of making the brochure, I learned more about the field of ethnomycology, which explores how fungi are used throughout different cultures, and I learned how to collect and identify fungi better. After a collecting trip, I would typically spend 2-4 hours in my dorm with a stack of reference books trying to pin down what my collected specimens were. The identification keys contained a lot of technical language that I became more familiar with as I learned more about fungi from my mentor, Savannah Gentry, and other graduate students in the Pringle laboratory.

Originally the brochure was going to be distributed throughout the Botany Department, but Dr. Pringle encouraged me to complete it in time for the Wisconsin Science Festival, held in October 2021. Botany Department Multimedia Specialist Sarah Friedrich designed the visual elements of the brochure and the Wisconsin Alumni Research Foundation provided the funding to print the brochures. A pdf of the brochure is available to print from the Lakeshore Nature Preserve website.

I am very happy about how this project turned out, and I am glad that I got to share my interest in fungi with others.

Photo submitted by the author

Peyton put his fascination with fungi to work by developing a *Mushrooms of the Lakeshore Nature Preserve* brochure.

Preserve and Arboretum co-hosted Wisconsin Master Naturalist Training

By Bryn Scriver, Preserve Volunteer & Outreach Coordinator

In October the Lakeshore Nature Preserve and the UW Arboretum co-hosted a Wisconsin Master Naturalist training with an focus on ecological restoration. Twenty participants engaged in the 40 hour training learning about ecological principles and the restoration process, practicing restoration and interpretive techniques, and visiting local field sites.

On a field day in the Preserve, participants collected native seed, practiced invasive buckthorn removal techniques, experienced a live fire demo, and toured Eagle Heights Woods with Preserve staff. Wisconsin First Detector Network Coordinator Anne Pearce led participants on an invasive species walk on Picnic Point and State Assistant Archeologist Amy Rosebrough gave a fascinating talk on local Native American history and showcased the Preserve's Indian burial mounds.

Supported through the University of Wisconsin-Madison Extension, the Master Naturalist program promotes awareness, understanding, and stewardship of the natural environment by developing a network of well-informed volunteers dedicated to conservation service within their communities.

To learn more about this statewide program, visit the Wisconsin Master Naturalist website.

Master Naturalists-in-training had several opportunities to participate in restoration activities in the Preserve and the Arboretum.

Photos by Bryn Scriver

Participants capped off their experience by developing and sharing a "teachable moment" with their fellow learners.

Bryce Richter/UW-Madison

Dog Walking: Off-Leash is Off-Limits

By Jeff Kirchman, UWPD Natural Areas Liaison Police Officer

When I patrol the Lakeshore Nature Preserve, it's not uncommon for me to meet people walking their dogs. Which is nice—it's perfectly fine to bring dogs into the Preserve. However, some important rules apply.

Dogs must be leashed at all times in the Lakeshore Nature Preserve…and, anywhere on university grounds for that matter. As a dog owner, I certainly understand the desire to let our canine friends 'off-lead' so they can truly stretch their legs. But a better choice for this is a recognized dog park. The City of Madison offers nine off-leash dog parks. Failure to leash a dog on university lands can result in a fine of up to $200.00

Dogs are also required to remain on trails and not roam amongst the foliage or fields. Long leashes allow dogs to range far and wide, but they're not appropriate for walks in the Preserve. A shorter, stout leash is probably the better choice.

Why are the rules so stringent?

One reason is safety—both for humans and pets. Unsecured dogs increase the chance of dog bites. Off-trail explorations present the risk of tumbles down lakeside cliffs.

Another is the protection of research being conducted in the Lakeshore Nature Preserve. For example, unrestrained dogs could negatively impact study sites used for Dr. David Drake's Urban Canid Project. This ground-breaking study of the habits of urban coyotes and foxes got its start here. Learn more about Dr. Drake's study on the UW-Madison Urban Canid Project website.

We welcome your dogs in the Preserve. Just please make sure you, and they, follow the rules to help maintain safety and enjoyment for all visitors.

Officer Kirchman can be reached at jkirchman@wisc.edu or 608-265-0468.

Drop-in and Group Service Volunteer Opportunities Resume in February

By Bryn Scriver, Preserve Volunteer & Outreach Coordinator

This winter volunteers are needed to continue to remove invasive brush along the main Picnic Point path and in Frautschi Point Woods. Invasive brush removal leads to greater biodiversity, better wildlife habitat, and less erosion.

As winter gives way to spring, volunteers will be needed to help remove invasive garlic mustard through-out the Preserve's woodlands.

How can you get involved?

Join one of our drop-in volunteer events and bring a friend! Weekend events start at 9:00 a.m. and go until noon with a mid-morning break. Work gloves and tools are provided. Check the Preserve Events Calendar for dates.

Is your group looking for a service project? Contact bryn.scriver@wisc.edu to discuss activities, dates, and numbers (typically 10-20 volunteers).

Volunteers are known to have fun while nurturing nature!


Bryn Scriver

Make a donation today to support the Lakeshore Nature Preserve's mission of active learning, research, and outreach.

Visit supportuw.org/giveto/lakeshore

Upcoming Public Meetings

Stakeholder Meeting

Each year Preserve stakeholders and partners have opportunities to meet with staff to learn more about Preserve operations and provide input. In September, Preserve staff provided a six-month status report on the 2021 work plan. Participants were invited to ask questions, share suggestions and ideas, and learn more about the Master Plan Update.

The next Stakeholder Meeting is Tuesday January 25, 2022 at 5:30 pm via WebEx.

Preserve staff will present the draft FY2023 work plan and budget for stakeholder and partner feedback. Please watch your email or the Preserve website for details regarding how to connect to the meeting and view the draft documents.

Master Plan Public Session #2

The next Preserve Master Plan Public Session will be scheduled in early Spring 2022. The consultant will present and collect comments on draft recommendations developed in response to public session #1, site analysis, and staff and committee input.

Please watch your email or the Preserve website for an announcement. We want your help in shaping the future of the Preserve!

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