

## Effects of Jumping Worms on Trees and their Fungal Friends

By Kevin Hobbins, Preserve Student Engagement Grant Awardee, Undergraduate, Botany

I've spent a lot of time over the past few months in the Lakeshore Nature Preserve sitting on the ground with a trowel. Visitors passing by have overwhelmingly been interested in what I've been doing. I'm commonly asked, "Are you collecting mushrooms?" To explain my odd behavior, I frequently respond, "Well...sort of." In reality, I collect roots from sugar maple trees and then, back in the laboratory, clear their pigments and stain them with ink. Finally, underneath a microscope, a hidden world becomes visible: a world composed of microscopic "mushrooms."

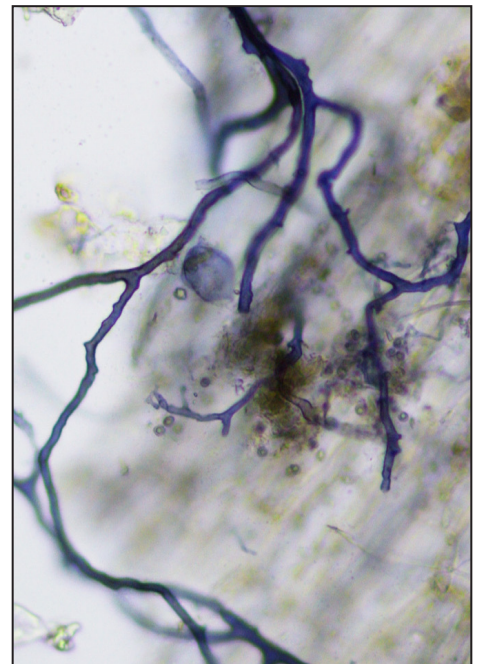
The "mushrooms" I study are called mycorrhizae and the particular group I'm interested in aren't really mushrooms at all. Instead, these mycorrhizae are forever hidden within the soil and are invisible to the passerby. But just because they can't be seen doesn't mean they are not

important. The interaction of plants and mycorrhizae is known as a mutualism, where a plant exchanges photosynthetically derived carbon for mineral nutrients that mycorrhizae absorb from the soil. The fungi also send out threadlike roots to increase the plants' ability to uptake water.

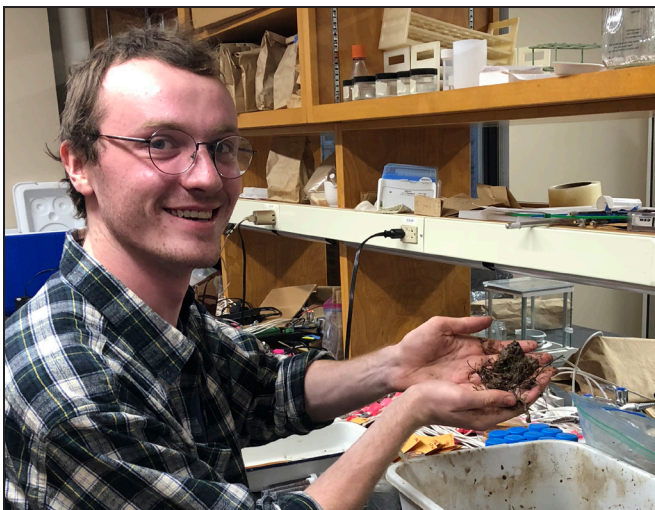
My research is investigating the impact of a new group of invasive earthworms, *Amyntas* ("Asian jumping worms") on mycorrhizal colonization and nutrient uptake in sugar maple trees. Previous studies have found that invasive earthworms reduce mycorrhizal colonization in tree roots, perhaps by physically disrupting tree roots and soil fungal networks.<sup>1</sup> Consequently, reduced mycorrhizal colonization may limit water and nutrient uptake by trees. Understanding how *Amyntas* earthworms impact mycorrhizal associations in sugar maples is

particularly important because *Amyntas* are unique compared to other earthworm groups living in the Preserve: *Amyntas* live primarily in the uppermost soil layers, have a highly flexible diet, outcompete other soil organisms, and live at densities ~10 times higher than other earthworm species. Thus, *Amyntas* may impact sugar maples and their mycorrhizal

associates in unique ways, particularly as they displace other earthworms.<sup>2</sup> Overall, this study hopes to add to the growing field of mycorrhizal research, as well as to help understand the ecological consequences of a new biological invasion in our local natural areas.



Above: Under the microscope, the blue-stained tissue are mycorrhizal structures (the strands are hyphae and the larger blue circles are vesicles used for storage) within cleared plant roots.



Left: Student researcher, Kevin Hobbins cleaning and preserving sugar maple roots in the lab. Photos provided by the author.

<sup>1</sup> Lawrence B, Fisk MC, Fahey TJ, Suarez ER (2003). Influence of nonnative earthworms on mycorrhizal colonization of sugar maple (*Acer saccharum*). *New Phytologist* 157:145-153. <sup>2</sup> Laushman KM, Hotchkiss SC, Herrick BM (2017). Tracking an invasion: community changes in hardwood forests following the arrival of *Amyntas agrestis* and *Amyntas tokioensis* in Wisconsin. *Biological Invasions* 20:1671-1685.



## From the Director...

By Gary Brown, PLA, FASLA

As the Preserve director, I often have to balance a lot of demands, not only on my time, but on the time our staff devote to the many initiatives in development across the Preserve. As we move from November into December, staff are drafting our upcoming work plan and budget for 2019. You

can review these documents at the next Lakeshore Nature Preserve stakeholder meeting set for January 29 at 5:30p.m. in room 132 WARF (610 Walnut Street). One of those high level, important initiatives will be the development of a strategic plan for the Lakeshore Nature Preserve. We've been talking about this for a few years but have now moved forward and met with the UW-Madison Office of Strategic Consulting who will help facilitate the strategic planning process starting in 2019. I can assure you this will be a very deliberate, engaging, and transparent process that I hope you all will devote some of your time and energy in the coming year. As the director, I'll be spending time helping to focus the discussion and assure that all of our stakeholders have a voice in the exciting process. Enjoy the coming holidays!



The next **Lakeshore Nature Preserve Stakeholder Meeting** is scheduled for **Tuesday January 29 at 5:30 p.m.** in room 132 WARF (610 Walnut Street). *Parking is free in lot 64 after 4:30p.m.*

We hope you'll join us for a **review of the draft 2019 work plan and budget.**

## Your Investment in the Future

By Laura Wyatt, Preserve Program Manager

As you consider year-end giving, please remember the Lakeshore Nature Preserve in your plans. While the university provides basic services, gift funds are consistently needed to support our educational mission in addition to caring for the land. Volunteer programs and supplies, prescribed fire, invasive species removal, planting and seeding, and land management equipment are supported solely through your on-going gifts.

**Your directed gift to the Lakeshore Nature Preserve Stewardship Fund through the Wisconsin Foundation and Alumni Association is an investment in the Preserve, not only for today but also for future generations.**

Gifts designated to the Preserve Stewardship Fund can be mailed to:

*University of Wisconsin Foundation  
US Bank Lockbox  
Box 78236  
Milwaukee, WI 53278-236*

or give online at <https://supportuw.org/giveto/lakeshore>

**Thank you for your consideration.**



## Picnic Point Homecoming Celebration

By Bryn Scriver, Preserve Volunteer & Outreach Coordinator

As a way to thank supporters and welcome alumni back to campus, Lakeshore Nature Preserve staff hosted a UW Homecoming Celebration before the October 20 Badger football game against Illinois. Staff greeted walkers and runners at the tip of Picnic Point with a roaring fire and hot chocolate and cider. Unfortunately strong winds and sleet shut down the celebration early but not before staff and a couple dozen visitors had a chance to mingle and enjoy the fall colors and views over Lake Mendota.



## Badger Volunteers Team up for the Preserve

By Emily Jorgensen, Preserve Invasive Species Specialist

This summer, the Lakeshore Nature Preserve hosted a group of seven student volunteers, part of the Morgridge Center for Public Service Badger Volunteer program which seeks to connect students with the community in the fields of education, sustainability, and public health. Between summer classes and part-time jobs, these university students showed up every Friday for eight weeks for a morning of hard work and hands-on learning.

For the majority of the group, volunteering in a natural area was a novel experience. It was gratifying to watch the students explore the Preserve beyond its most popular destination—Picnic Point. The volunteers pulled invasive species such as garlic mustard, sweet clover, and wild parsnip at the Class of 1918 Marsh. They mulched the steep trails of Eagle Heights Woods, taking a break to appreciate the Native American mounds located there. They learned about prairie restoration and spent the morning collecting native seed in the Biocore Prairie. Along Lakeshore Path, they sawed and lopped the most pervasive invasive shrub in the Preserve—common buckthorn—opening up views of Lake Mendota and opening up space for a greater diversity of native plants.

With more than 100 hours committed to the Preserve, the Badger Volunteers gained new skills including: the ability to identify a number of plants to species; an awareness of the diverse ecosystems in the Preserve; and knowing that their work will benefit plants and wildlife in this urban habitat. Team-building skills were strengthened, and by the end of the summer this group was able to complete complex tasks with impressive efficiency. Above all, they learned that management of this campus natural area is an ongoing endeavor, one that is multi-faceted and at times, daunting. We are grateful for their diligent work and curious minds, and hope to see them again next year!



Badger Volunteers play it cool as they pose in front of their freshly removed pile of common buckthorn. Take that, invasive species! Photo by Emily Jorgensen.



Students in Environmental Studies 400 visit the Preserve to learn about the use of fire from Field Projects Coordinator Adam Gundlach. Photo by Doris Dubielzig.

## Prescribed Fire Class Visits Preserve

By Adam Gundlach Preserve Field Projects Coordinator

In July, the Lakeshore Nature Preserve served as a convenient field trip destination for a new summer course called “Science and Practice of Prescribed Fire” (Environmental Studies 400), offered through the Nelson Institute for Environmental Studies. The course was taught by Paul Zedler, Nelson Institute Associate Director for Research and Education, along with Craig Maier, coordinator for the Tallgrass Prairie & Oak Savanna Fire Science Consortium.

Through a series of field trips, readings, and writing assignments, the course sought to explore the question, “what does it mean to manage a fire-adapted ecosystem?” Field trips to a variety of natural areas around Dane County provided students an opportunity to hear land managers discuss the numerous social issues and ecological considerations that influence the use of prescribed fire across the region.

Preserve Field Projects Coordinator Adam Gundlach, led the class on a tour of the Lakeshore Nature Preserve to discuss the basics of prescribed fire planning and implementation. At the Biocore Prairie, Gundlach was joined by Biocore Lab Manager Seth McGee, to discuss the research opportunities that fire management offers students in the Biocore program. Next, the class visited Eagle Heights Woods to discuss how fire planning and implementation differs in a woodland system, especially a woodland nestled in a residential neighborhood.

According to instructor Craig Meier, “being able to visit two very different fire-dependent ecosystems right on campus was a great asset for this course. Having Seth McGee there to discuss how the prairie works as an outdoor classroom and lab as well as a restored ecosystem added another component to the class that we didn’t get anywhere else.”



## The President's Oak Returns to Campus

By Bryn Scriver, Preserve Volunteer & Outreach Coordinator

Around 1715 a squirrel (probably) planted an acorn on top of a hill on the south shore of the largest of the "Four Lakes." A bur oak tree took root and grew for nearly 150 years before a house was built near it. That house would later serve as the official residence for three university presidents: Chadbourne (1867-70), Twombly (1871-73), and Bascom (1874-78). The tree, then known as the President's Oak, stood for another 150 years as the



university grew around it. In 2013, as it became obvious that the nearly 300 year old tree was failing, Mike Yanny ('79, Horticulture) took a cutting and grafted it to oak root stock to start a new tree. Two years later, the tree was removed, but not before preschoolers in the UW Child Development Lab who often visited the impressive old tree said their goodbyes. On October 10, 2018 some of those same students returned for the planting of the new President's Oak as part of a ceremony featuring remarks by Chancellor Rebecca Blank and Professor Ray Guries, and an offering of tobacco leaves by Assistant Dean Aaron Bird Bear.

History of the oak provided by Daniel Einstein, UW Historic and Cultural Resources Manager.



Above: Former preschoolers from the UW Child Development Lab help plant the new President's Oak. Photo by Bryn Scriver.

Left: The President's Oak circa 1950.

## Wet Weather Brings Phenomenal Fungi to the Lakeshore Nature Preserve



Yellow slime mold  
consuming  
*Pleurotus ostreatus*



*Armillaria* species



*Pholiota* species



*Phlebia*  
*coccineofulva*



unknown



*Grifola frondosa*



*Hericeum*  
*americanum*



*Trametes* species



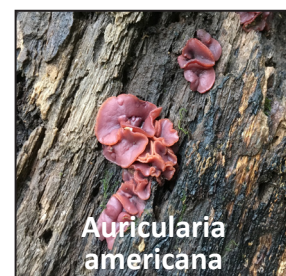
*Hypsizygus ulmarius*



unknown



*Mycena* species



*Auricularia*  
*americana*

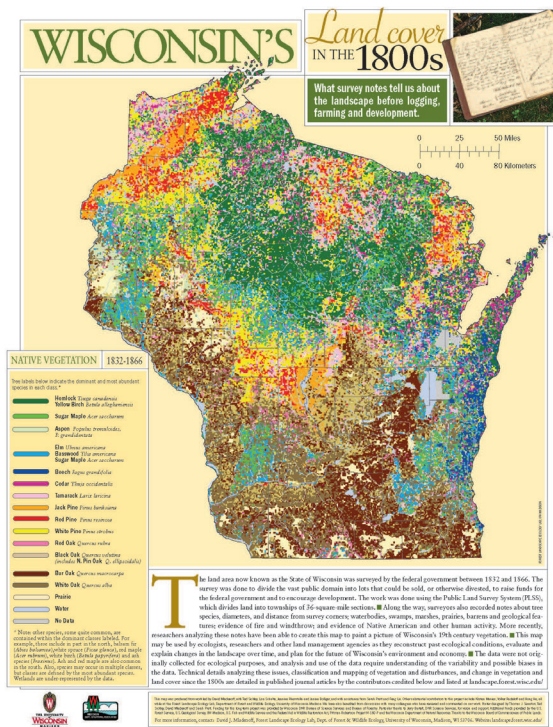
Photos by Adam Gundlach and Bryn Scriver



## Bearing Witness to Witness Trees

By Adam Gundlach, Preserve Field Projects Coordinator

The land now occupied by the Lakeshore Nature Preserve was once contiguous with the surrounding prairie and oak savanna vegetation that typified southwest and south-central Wisconsin. Scanning through the original Public Land Survey System records from 1834, oaks (black, white, and bur) are the only trees referred to in surveyor's notes describing section lines through what is now the Preserve. These trees were often referred to as "witness trees" or "bearers." Similar land survey records covering the entire state of Wisconsin were later compiled into a broad-scale map summarizing [Wisconsin's landcover in the 1800s](#), produced by the Forest Landscape Ecology Lab in the Department of Forest and Wildlife Ecology at UW-Madison.



Public Land Survey System records from the mid 1800s document an oak dominated landscape across southwest and southcentral Wisconsin (light to dark brown on the map).

For thousands of years, Native Americans favored a mosaic of open-structured natural communities through their use of fire, and the shifting pattern of herbivory that followed. For a period following European settlement, agricultural practices maintained some of the open structure of the historic landscape, filling in gaps between oak groves with cultivated fields and pastures for grazing livestock. Then, over the next 100 years as agricultural pursuits were abandoned, fast-growing early-successional trees and brush filled in much of the land. In the Preserve, this is well documented by aerial photos dating back to 1927. Can you believe much of the Preserve was fields and open woodlands in the not so distant past?



This 1927 air photo of the Preserve's Picnic Point shows overgrown savanna and scattered oaks with cropped fields and pasture.

Oaks are a landscape-scale phenomena. Oak trees require ample sunlight to get established, and in order to reach maturity, they need a combination of site conditions and disturbances (fire, grazing, canopy gaps) to give them a competitive advantage over faster growing and more shade tolerant trees. To ensure a future oak canopy will require planning and continued management on the scale of decades and centuries. Preserve staff are in the process of assessing the current oak community and identifying potential areas to focus management on oak regeneration. As management for oak regeneration progresses in portions of the Preserve in the years ahead, phased thinning of early-successional and shade-tolerant trees will open light for a more diverse groundlayer community as well as for young oaks to grow and bear witness for future generations.



Management will ensure the Preserve continues to have large oak trees into the future. Photo by Bryn Scriver.



# Friends of the Lakeshore Nature Preserve Field Trips

## DECEMBER

### 1 Birding Madison Lakes

(Sat., 7:30–11:00 a.m.) As winter sets in, smaller ponds and lakes in southcentral Wisconsin freeze, causing migrating birds to become concentrated on Madison's large lakes, which remain open longer. We will look for waterfowl, gulls, and winter birds. This trip has produced some unusual sightings in the past, including red-throated loons—so don't miss it! Meet at the middle of UW parking lot 60. Bring a scope if you have one. Leader: Quentin Yoerger (255-2473, [info@madisonaudubon.org](mailto:info@madisonaudubon.org)).

### 23 Bird and Nature Outing (See box at right.)

## JANUARY

### 12 Animal Tracking in the Preserve

(Sat., 1:00–3:00 p.m.) Join UW wildlife specialist and Professor David Drake as he shows how to track foxes, coyotes, and other denizens of the Lakeshore Nature Preserve. Meet at UW parking lot 129 at the entrance to Picnic Point. Sponsored by the Friends of the Lakeshore Nature Preserve. Leader: David Drake (890-0445, [ddrake2@wisc.edu](mailto:ddrake2@wisc.edu)).

### 27 Bird and Nature Outing (See box at right.)

## FEBRUARY

### 17 Blue-Green Algae Blooms in Madison Lakes

(Sun., 1:30–3:00 p.m.) UW Civil and Environmental Engineering Professor Trina McMahon presents a special "indoor field trip" to discuss the effects of algal blooms on the Madison lakes and their impact on the shores of the Lakeshore Nature Preserve. Meet at the UW Eagle Heights Community Center, 611 Eagle Heights Drive. Sponsored by the Friends of the Lakeshore Nature Preserve. Leader: Trina McMahon (890-2836, [trina.mcmahon@wisc.edu](mailto:trina.mcmahon@wisc.edu)).

### 24 Bird and Nature Outing (See box at right.)

## MARCH

### 24 Bird and Nature Outing (See box at right.)

### BIRD AND NATURE OUTINGS

Every 4th Sunday of the month from 1:30–3:00 p.m. Meet at UW Parking lot 129 (near the entrance to Picnic Point).

These informal outings welcome students, families and kids. Discover the gentle paths that wind through prairies, woods, and wetlands. Enjoy vistas along the Lake Mendota shoreline and Picnic Point. Walk leaders and participants share their knowledge about the birds, animals and plants along the way. Sponsored by the Friends of the Lakeshore Nature Preserve. Leader: Paul Noeldner (608-698-0104).



Visitors enjoy an "owl prow!" on a recent Bird and Nature Outing at Picnic Point. Photo by Doris Dubielzig.

**To learn more about the Friends of the Lakeshore Nature Preserve  
visit their website at [www.friendslakeshorepreserve.com](http://www.friendslakeshorepreserve.com)**



## Volunteer Stewards

By Bryn Scriver, Volunteer and Outreach Coordinator

It took a while to find a date on which we wouldn't be carried off by hungry mosquitos or soaked by rain, but in early October the Preserve Volunteer Stewards gathered for a picnic lunch and group volunteer event at Biocore Prairie. Volunteer Stewards are recruited for specific on-going tasks. After lunch, Steward Steve Sentoff trained fellow volunteers and staff how to use the iNaturalist app for recording species within the Preserve. (See box at right). Then we headed into the prairie to collect the soft, fuzzy seeds of Indian grass.

If you'd like more information on the Volunteer Steward program please contact Bryn Scriver ([bryn.scriver@wisc.edu](mailto:bryn.scriver@wisc.edu)). Recruitment starts in spring. We are in need of volunteers with native plant gardening experience to help care for the Preserve's native plant entrance "gardens."



## BECOME AN iNATURALIST!

*iNaturalist is an online social network of people sharing biodiversity information to help each other learn about nature.*

The great thing is that you don't have to know what you're recording! See an interesting plant or animal? Snap a photo, upload it to the site, and wait for an identification. Identifications are crowdsourced by an online community of people with varying levels of skill. World-wide, nearly 350,000 people have submitted over 12 million observations.

In the Lakeshore Nature Preserve, more than 100 people have submitted over 2,000 observations. This information is available to anyone who is interested. Not only can you identify organisms but it provides a record of occurrence for species. You can also connect with other people over a place of interest—like the Lakeshore Nature Preserve!

To learn more, visit the [iNaturalist website](https://www.inaturalist.org).

## Winter Volunteering

Winter is still a great time to get outside and volunteer for your favorite natural area.

- Remove woody invasive plants
- Training, tools, and gloves provided
- Groups and youth welcome with advance notice

DATE	DAY	MEETING PLACE
DEC 2	SUN	FRAUTSCHI POINT LOT
JAN	---	WINTER BREAK!
FEB 23	SAT	FRAUTSCHI POINT LOT
MARCH 9	SAT	FRAUTSCHI POINT LOT
TIME: 9:00 A.M.-NOON		

For more volunteer dates visit the Preserve events calendar at [lakeshorepreserve.wisc.edu/events-calendar/](https://lakeshorepreserve.wisc.edu/events-calendar/)

For more information contact the Volunteer Coordinator at [bryn.scriver@wisc.edu](mailto:bryn.scriver@wisc.edu).





## Canid Research Continues in the Preserve

One of the goals of the [UW Urban Canid Project](#), directed by Professor and Extension Wildlife Specialist David Drake, is to learn more about urban coyote and fox ecology to be able to proactively manage for peaceful coexistence. With the right knowledge, living with wild urban canids can be safe, enjoyable, and rewarding. While conflict with coyotes and foxes is a real possibility, it is largely avoidable.

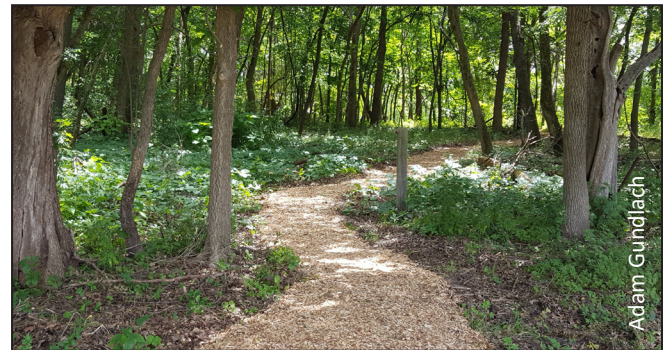
- **Don't Feed them**
- **Monitor Pets**—don't let them off-leash in areas known to hold coyotes
- **Haze them**—if a coyote approaches, yell or clap loudly to re-instill a natural fear of humans
- **Respect them**

AND PLEASE REMEMBER TO  
KEEP YOUR DOG ON-LEASH  
WHILE VISITING THE  
PRESERVE!



## New Trail Connects Frautschi Point Parking Lot to Biocore Prairie

Visitors now have a new way to get to Biocore Prairie by way of a trail that originates near the Frautschi Point parking lot. This new shaded, woodland trail bypasses the Water Utility driveway and fence. The Prairie Partners Intern crew (sponsored by the Friends of the Lakeshore Nature Preserve) cleared stumps and laid out fresh wood chips after the Preserve's student Natural Areas Assistant and Landscape Architecture student, Leah Stoltz laid out the best route.



Like what you've read?  
Help us do more!

To support the Lakeshore Nature Preserve's ongoing mission of teaching, research, and land stewardship, make a donation today.

Visit [supportuw.org/giveto/lakeshore](https://supportuw.org/giveto/lakeshore)

Lina Eckholm

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For announcements, photos, and information on the Lakeshore Nature Preserve, please find us on Facebook and follow us on Twitter and **NOW INSTAGRAM!**



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Facilities Planning  
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