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Journeys of the Arizona Mushroom Society

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- Strawberry Monsoon Festival and Mogollon Rim Forays - August 6, 2022
- Annual White Mountain Foray Aug. 12-14, 2022
- Citizen Science Fungi Survey in the Santa Ritas, August 19 - 20, 2022
- Sky Islands Forays, August 25-26, 2022


*Event webpages will be updated with more information, when available.



What is the Arizona Mushroom Society All About?

The Arizona Mushroom Society is focused on,

- (1) increasing education about our local fungi and mycoflora,
- (2) supporting local communities, students, and local fungi-related institutions, and
- (3) furthering the study and scientific knowledge of Arizona fungi.

We're a 501(c)(3) non-profit organization that is run on volunteer  power! Please contact us at azmushroomsociety@gmail.com if you would be interested in helping out whether it is planning events, organizing photo contests, managing merchandise, participating as a board member, or bringing your own special skill to Arizona fungi lovers!

The Great 2022 AZ Morel Hunt!

The Arizona Mushroom Society has made 2021 burn maps where you can search for the elusive AZ fire morel!

Culinary Corner

Lisa Goodwin's mouth-watering Morel Risotto

Current Chester Leather Scholarship Recipients

Dr. Catherine Gehring presents myco-work happening in the northern Arizona Gehring Lab.



Mushroom Discoveries

On March 10th of this year, Scientific Committee Chair, Terri Clements, shared DNA sequencing results of fungi found by folks including Brent Ewasiuk, Christina Akins, Sarah Douthit, and Spencer Wimmer in Arizona in summer 2021. These DNA sequencing results were posted on the [Arizona Mushroom Forum Facebook group](#).

Member of the Month

Michael Colosimo is the current President of the Arizona Mushroom Society. He was voted in as a board member in December 2020 and stepped up to take on the Presidency shortly thereafter. While not a fungi expert, Mike has shown great enthusiasm and generosity for sharing knowledge about our local mycoflora. His job as an Intel Foundation Disaster Relief Program Manager and Matching Specialist of Intel's Volunteer and Donation Programs gives Mike unique skills, which he has used to greatly benefit the Arizona Mushroom Society. Just this winter, Mike's volunteer time was matched by Intel Foundation to result in over \$8,000 in funds for Arizona Mushroom Society programs. That funding will be used to fund scholarships for AZ fungi scholars, keep mushroom forays cheap for members, and pay for additional study and testing of our local AZ fungi.

Mike has been with Intel for nearly 17 years, he started his career as an Equipment/Engineering Technician in the cleanroom. His primary role was repairing the high-tech semiconductor testing machines and robots. He then found a passion for volunteering, working with Intel Global Public Affairs, he began coordinating and hosting volunteer events on night shift in the factory to benefit many local charities. With an emphasis on organizations providing . .



This purple textured beauty found at about 8,000 feet elevation on Mt Lemmon was identified to be *Enteloma Occidentale* var. *metallicum*. This species is primarily known from the Pacific Northwest area and Spencer's find was the first known from Arizona.



This *Enteloma* is a saprobic mushroom that usually grows in spruce-fir habitat type and can be found in leaf litter and decaying organic matter. Way to go Spencer and Terri for building the scientific knowledge of our Arizona fungi!



assistance to children with cancer and the local elderly community. Shortly after he joined the Intel Foundation.

Mike's current Disaster Relief campaign has raised 2.1 million dollars in relief funds for the current war in Ukraine, this amount included employee donations plus the Intel Foundation match.

Terri Clements also vouchered and tested this Amanita species found in pine and oak along the Mogollon Rim. Amanita magniverrucata, the great pine jewel, was previously known from California in association with Bishop pines. Finding it in Arizona marks an interesting range extension for this unique species!

The Great 2022 AZ Morel Hunt!

How-to guide by Mike Dechter

Over the past several years the Arizona Mushroom Society has been publishing maps of recently burned areas for AMS members to hunt for the tough to find and highly sought after burn morel mushroom! While morel mushrooms are rare to find, this is a great opportunity to get outside, go on a long hike, and hone your mushroom hunting skills!



To be clear, hunting the Arizona burn morels is challenging. Unless there is a large snowpack, or some good spring precipitation, burn morels may not fruit very much or at all for that year. However, we have had some Arizona wildfires that yielded hundreds of pounds of burn morels when conditions were just right. With recent late winter storms, the chances for modest fruitings of burn morels in recent burns is possible this year in Spring 2022. You will need to consider key factors of the locations you are looking such as slope, aspect, soil temperatures, tree species, and whether or not the area has been recently (within 1-2 years) burned.

The most limiting factor in Arizona is enough moisture to facilitate the growth of burn morels before it gets too hot and dry for them to fruit. So, some years are better than others based on snowpack, spring precipitation, and temperatures.

When conditions are right, burn morels can grow in large numbers in recently burned areas (usually after soaking spring rains). They grow in habitat ranging from Ponderosa pine forests to higher elevation spruce-fir vegetation.



Since morel mushrooms grow from tree roots, they can only be found in areas with these trees. The fruiting of morel mushrooms can be triggered by wildfires, so having a good map of recent wildfire boundaries is a key resource for having a successful hunt.

We have created maps of recent burned areas throughout Arizona that you can use with the free [Avenza Maps App](#) to go on an adventure and hopefully find the elusive Arizona burn morel!

Here's how it works:

Step 1. Get the app

Install the [Avenza Maps](#) app on your smartphone or tablet. The app is available free from the Apple Store (iPhones and iPads), or from the Google Play Store (Android smartphones and tablets) Type "Avenza Maps" into the app store's search function to locate and install the app. An Apple or Google account ID and password may be required.

Step 2. Get the maps

The Arizona Mushroom Society has set up an online event which is now open! Any Arizona Mushroom Society member can register for free to get a link for accessing maps of recent burn areas in Arizona.

The link provided to you takes you to the "storefront" where all Arizona Mushroom Society wildfire maps are on display for download.

Step 3. Get going!

Once you download the maps you want you can use them on the Avenza Maps App to navigate yourself to and throughout burn areas in search of those ever so tasty morels. The maps will be cached on your phone, so no cell signal or network is needed to use the app in the woods. Just make sure not to run out of batteries!



Culinary Corner



Morel Risotto from the kitchen of Lisa Goodwin

Excitement is in the air as we anticipate the 2022 mushroom season here in Arizona. First up are spring morels, and I am sure that many of our members will be out in force in the riparian regions seeking the blondes or “natural” morels. Some will be hitting the burn areas around the state in the higher elevations in search of the fire morels that can flush in large numbers, provided conditions are right. There’s nothing quite like the joy of finding a great flush of morels – and enjoying a special meal prepared with your finds. One of my favorite ways to enjoy morels is in risotto, which adds decadence to any meal and is a great dish to savor the earthy flavor of the prized morel.

The recipe below has been adapted from a Bon Appetit recipe which has become a family favorite. I hope you enjoy!

Morel Risotto

- 8 tablespoons of unsalted butter (divided)
- 1 pound fresh morels (or 2 ounces dried)
- 7 cups of broth (beef, chicken or vegetable combined with your mushroom soaking liquid)
- 1 tablespoon olive oil
- 1 1/4 cups arborio rice
- 1 cup finely diced shallots (2 or 3)
- 1/2 cup dry white wine
- 1/4 cup of freshly grated Parmesan cheese (plus additional for serving)

Prepare your mushrooms.

If using fresh mushrooms, rinse well and chop (slice larger mushrooms, otherwise, half or quarter) so you have nice meaty pieces that will cook evenly.

If using dried mushrooms, soak for 30 minutes in hot water (strain and save that water for a great mushroom broth); squeeze out excess liquid and chop.

Bring the 7 cups of broth to a simmer in a medium saucepan and keep it warm.

Melt 2 tablespoons of butter in a large heavy saucepan over medium high heat.

Add $\frac{1}{4}$ to $\frac{1}{2}$ of mushrooms and sprinkle with salt.

Cook for 4 minutes.

Repeat in batches until all of the mushrooms are cooked.

Set cooked mushrooms aside.

Reduce heat to medium and add 2 tablespoons butter and 1 tablespoon olive oil to the saucepan that was used for the mushrooms.

Add diced shallots, sprinkle with salt and sauté until tender and translucent (about 4 minutes).

Add the rice and increase heat to medium and stir until the edges of the rice begin to look translucent (3 or 4 minutes).

Add the wine and stir until the liquid is absorbed.

Add $\frac{3}{4}$ cup of warmed broth to the rice and stir until almost all the broth is absorbed (about 1 minute).

Continue adding broth in $\frac{3}{4}$ cup increments, stirring, and allowing almost all the broth to absorb into the rice before adding more.

Once rice is about halfway done (10 minutes or so), add the reserved mushrooms back the pan and continue adding broth in $\frac{3}{4}$ cup increments until rice is al dente (tender, yet firm to the bite) and risotto is creamy (this will take approximately another 10 minutes). Once the rice is done, stir in $\frac{1}{4}$ cup of freshly grated parmesan cheese and transfer to serving bowls.

Add additional parmesan cheese if desired.

Presenting the Current Chester Leather Graduate Scholarship Recipients

by Catherine Gehring, Ph.D.

Lucking Family Professor, Associate Chair and Director of Graduate Studies, Department of Biological Sciences, Co-Director, Center for Adaptable Western Landscapes, Northern Arizona University

The Gehring Lab at NAU studies fungi that associate with plants including mycorrhizal fungi that help plants access soil resources, endophytic fungi that can have beneficial or neutral effects on plants, and pathogenic fungi that cause disease. We are interested in understanding more about the basic

biology of these fungi, and how they can be applied to problems affecting Arizona's wildland and agroecosystems. Three students recently received generous funding from AMS in the form of Chester Leather Graduate Student scholarships. Information about their projects is detailed below.

Gillian Trimber (2022 scholarship recipient)



Gillian Trimber examining a pinyon cone prior to seed extraction for her experiments

Gillian has been working on the legacy that wildfires can leave on soil fungal communities in pinyon-juniper woodlands at Mesa Verde National Park and on the Colorado Plateau more broadly. When fires sweep through an area and kills existing trees, this can create hotter, drier conditions that make it more difficult for tree seedlings-- and likely the mycorrhizal fungi that they depend upon-- to survive. Grasses that invade or are seeded after fires can also change which fungi are present in the soil.

Gillian has been growing pinyon seedlings in the greenhouse using soils taken from wildfire areas and adjacent intact woodlands in order to see if the mycorrhizal communities in these soils differ. She has also been examining the interactions between grasses, pinyons, and mycorrhizal fungi in order to see if grasses change the mutualisms that develop between tree seedlings and the fungi that they partner with.

The goal of Gillian's work is to inform land management decisions surrounding best practices for reseeding an area after fire and to develop strategies for helping pinyon-juniper woodlands regrow.

Bea Bock (2022 scholarship recipient)



Bea Bock preparing endophytes for inoculation onto sorghum to test for drought tolerance.

Plants host a variety of fungi and bacteria inside and around their roots, and these microbes can provide important benefits to their host plant in terms of plant growth, drought tolerance, and pest resistance. Drought is of particular interest to the Gehring Lab because of the devastating effects it can have on native plants as well as crops, especially here in the American Southwest. Certain plants like sorghum (*Sorghum bicolor*), which is originally from Sub-Saharan Africa, are relatively well-adapted to drought, and the microbes which live in their roots may provide key information about how these plants tolerate drought so well.

Bea is studying which root microbes are most important to plants like sorghum in their drought tolerance. She is also determining if these microbes can help other plants that are struggling because of drought, which has implications for both agriculture and native plant restoration.

Lisa Markovchick (2021 scholarship recipient)



Lisa Markovchick making measurements in the field

As a prior land and natural resources manager, Lisa's passion is understanding what mycorrhizal fungi contribute to ecosystems, when these fungi are depleted, and how they can be restored. For her PhD, Lisa has been studying how the invasive shrub, tamarisk, depletes native mycorrhizal symbionts of native cottonwood trees, how this affects their photosynthesis and water usage, and whether inoculation during replanting can restore some of these relationships.

In one study, Lisa identified moderating effects that inoculation with native mycorrhizae can have on cottonwood photosynthesis and water use after a tamarisk invasion. In another study, she evaluated whether native Arizona ectomycorrhizal communities naturally regenerate after replanting, and how the symbioses are affected by assisted migration of plants. Native ectomycorrhizal communities did not naturally regenerate, and colonization was even more reduced for non-local plant provenances. In a third study, Lisa systematically examined land management plans from national grasslands and national forests, and state forest action plans, to investigate whether the innovative practice of restoring native mycorrhizal communities has successfully transferred from academic research into implementation in habitat restoration and land management.

Only 8% of the management plans (n=130) mentioned mycorrhizal fungi, and only two made any mention of the utility of soil or mycorrhizal fungi in forest or habitat regeneration or restoration. As a result, we developed tools we included in the publication for natural resource managers to help identify when and why mycorrhizal fungi should be considered in management and restoration, and suggest steps folks can take to incorporate them, and provide tips on how to implement these steps.

AMS has contributed to two of these projects, helping to make them possible and/or publicly available when they are published.