



From
Our President

1,051,200 ...
Can you guess what that number represents? It's 2 years in minutes. By the time you are reading this newsletter, my 1,051,200 minutes as your president will be almost over. There will be no protest of the vote count from me! I have truly enjoyed all of these minutes and I have so much respect for all of you with your commitment to our mission. As a chapter, we have given thousands of hours in volunteer service to either improve our planet or pass along our knowledge to others so that they can keep improving our planet. Keep up the good work, everyone! If we can

make it through the pandemic and still volunteer so many hours, just imagine what we can do in the next few years!

Training for future Master Naturalist has been how I've spent my summer. There's a lot of planning that goes into this and several members of the three chapters have showed up and committed to getting this done. The training class is again a hybrid of Zoom and in person field sessions. We had 41 individuals at our first class. Again, many of our members have stepped up to assist with this training. I think that our new MDC representative, Jenni Rabenau and the new MUE representative, Eli Isele, have been very impressed with the three chapters in their commitment to get this done. (As well as the chapters have been impressed with both of these individuals in their participation.)

We will be needing mentors for the new members to help with their inclusion into our chapter. If you feel a "calling" for this, please let me know. Making someone feel welcome is one of the most important things we can do when

Missouri Master Naturalist
2022 Certification Pin
Grass Pink,
Calopogon tuberosus



someone is coming from the outside into our group. October 8, 2022 is the date for our Tri-Chapter Field day. We know there will be tram rides around Babler State Park as well as hikes, advanced trainings and just having fun! You can come for a few hours or stay all day. More information will be forthcoming as the date gets nearer. Finally, thanks everyone for letting me be your president. Hopefully, I have assisted in the continuity of the good works we strive to do.

Here's to the Missouri Master Naturalist program!

Alison

Alison Robbins
President, Confluence Chapter



A partnership of the [Missouri Department of Conservation](#) and [University of Missouri Extension](#)
To engage Missourians in the stewardship of our state's natural resources through science-based education and volunteer community service.
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Awards and Recognitions



July:

Bob Lee was honored for his immense effort with Missourians for Monarchs. We were given six butterfly weed plants to use in a "memorial" for all his efforts.

Gary Webster presented award to Frank Dvorak for reaching the 1000 hrs. milestone and for his efforts and willingness to step up for a variety of activities. Way to go, Frank!

The Broemmelsiek Bluebird Trail

was quite successful this year with 43 bluebirds fledged, 28-31 tree swallows fledged, and one nest of 5 chickadees fledged. The trail has been quite successful, and has surpassed last year's fledging numbers one month earlier than last.

We have had no deaths, no major damage from sparrows or wrens. No park complaints or human meddling.

We have moved one box twice and once in the proper location, bluebirds quickly moved in. And, we still have room to grow!

MN Amanda Templer



The bluebird carries the sky on his back,

~Henry David Thoreau





By MN Jerry Lindhorst

Climate Change 2

This article is the second in a series of articles about how our climate is changing. The explanation of why we must immediately act to stop the on-going devastation caused by our Earth warming and changing our climate is taken from collaborative research provided by scientists all over the world.

Here in St. Charles and St. Louis Counties we experienced a July week of a historical number of days climbing to over 100 degrees. And then we were hit with a down-pour of rain which I measured 11 inches in my five-gallon garden container. Our communities were flooded causing serious damage. Yet, we didn't come close to the flooding devastation in Eastern Kentucky and the extreme heat that followed.

It is time to consider what scientist have been warning us for decades. Our Earth was formed approximately 4.6 billion years ago. Its temperature changed with periods warmer than today and sometimes it was much colder.

However, it is the speed at which our Earth is now warming that worries scientists. The rapid warming of Earth began in the 1880s when we started burning coal in factories to produce energy followed by the industrial revolution.

In 1882, the first large electricity station was built. In 1908, the first large discovery of oil was made in the Middle East. In 1913, the first mass-produced motor car (Model-T Ford) hit the roads. In

1952, the first jet airline service began. In 1970, many of us faced an oil crisis, but even this did not affect our demand for fuel.

As we increased our usage of coal and other fossil fuels, Earth's temperature also increased. A total of 70% of the world's energy is powered by burning fossil fuels, which include coal, oil, and natural gas. When we burn these energy providers, they release large amounts of carbon into our atmosphere as part of the gas carbon dioxide (CO2).

Interestingly, all living things use and store carbon. Millions of years ago, when plants and animals died, some were buried, crushed and fossilized under the ground. Oil, coal and natural gas were formed from these fossilized remains, thus, called fossil fuels.

When we burn fossil fuels, the CO2 enters the atmosphere and disrupts the natural process. This process involves the greenhouse effect. Think of a greenhouse where it lets in light and traps the warm air inside. This is much like the Earth's atmosphere, which lets sunlight pass through and traps the heat inside. It has kept our planet warm enough to support life for billions of years.

However, as the amount of greenhouse gases increases, more heat is trapped in our atmosphere. Greenhouse gases include 99% CO2 with the remaining amount containing methane, nitrous oxide, ozone and halocarbons. Simply put, the more CO2 we release, the hotter our Earth becomes.

There are a number of ways to help reduce what is called your own carbon footprint (the amount of carbon you generate). This series of articles will offer ways to help you protect our Earth by reducing the amount of carbon you put into the atmosphere.

Save Energy:

- ◇ Replace every traditional light bulb with an energy-efficient CFL bulb;
- ◇ Turn televisions, computers and other electronics to "OFF" instead of "standby" or "sleep;"
- ◇ Always unplug chargers for cell

phones and mp3 players after use;

- ◇ Turn down central heating in winter' and
- ◇ Turn down air-conditioning in the summer.



The natural world is in deep decline due to the grossly unsustainable habits of humankind.

This is no secret. You can find evidence everywhere, from global warming to rain forest destruction to mass extinctions, all of it done in the name of free enterprise and short term profit. Fortunately more and more people are waking up to these facts and working to find solutions on all scales.

Let's just hope it is not too late.

*~Heather Jo Flores,
"Free Your Lawn (and the rest will follow), "Food Not Lawns: How to Turn Your Yard into a Garden and Your Neighborhood into a Community, 2006,
foodnotlawns.com
[Grow Food Not Lawns](http://foodnotlawns.com)*





MN Mary Meinhardt

Mary, Mary, Quite Contrary How Does Your Garden Grow?

Good News from the Garden!
My Native Field Thistle (*Cirsium discolor*)



finally started to bloom. Part of the Thistle "fell over" but that's not stopping it from blooming, and the Tall Thistle (*Cirsium altissimum*) is not far behind. I had heard that any thistles blooming earlier than this,

could be identified as non-native just based on their bloom-time. Both are biennial so I'll have to make sure they re-seed AND they can hybridize!

How about that!

I have lots of "worts" in my garden and started researching them until I learned that there are a bajillion of them! I learned that "wort" is a derivation of the word "wyrt", an old English word meaning



"plant, root, or herb". The suffix "wort" was given to plants which were considered beneficial with the opposite being a "weed". There's lots of interesting reading on line, if you want to delve into all those "worts and weeds" <https://www.gardeningknowhow.com/garden-how-to/info/what-does-wort-mean.htm>

[Plants With "Wort" In Their Name – What Are Wort Plants \(gardeningknowhow.com\)](https://www.gardeningknowhow.com/garden-how-to/info/what-does-wort-mean.htm)

Instead of motherwort, thoroughwort, spiderwort, or lungwort, I want to share my on-going struggle with our native rose verbena (*Glandularia canadensis*). I love the little plant but have killed it more than three times, and that is usually when I



give up and refuse to plant it ever again. Other people have beautiful displays, but my yard offers poor drainage and lots of shade—characteristics that do not bode well for a healthy rose verbena. Instead, the little plant typically occurs in prairies, fields, pastures, rocky glades, roadsides and waste areas in the central and southern parts of Missouri.

<https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=f204>
[Glandularia canadensis - Plant Finder \(missouribotanicalgarden.org\)](https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=f204)

As I have become a little more aware of "right plant, right place", I realize that I MUST put a sun-loving plant IN the sun, and a plant that loves a "glade community" MUST be planted with fellow glade lovers IN a rocky well drained area with soil of a higher PH (about 7.5 or above) than other perennials. Last year, I planted three plants in two different locations, hoping that at least one of the places might be suitable. It turns out that all three plants thrived until our scorchingly hot weeks, when I unfortunately ignored the area in the front yard that I had specifically devised for the verbena. I had used a "recipe" for glade conditions but realized when I installed it that the depth of the mixture was inadequate, so the roots could not go deep enough to sustain themselves over the severe drought we had this summer, and I failed to water that area.

Excitingly for me, the other verbena plants have done well planted

on a sunny hillside with a little paver base scattered around to "sweeten" the soil. The area may be "well-draining" only because it is on a slope. The verbena plant itself blooms from May to August and looks good planted in pots and hanging baskets because of its trailing tendencies. It attracts bees, hummingbirds and several types of butterflies. It is not winter hardy at the top of zone 5, so a layer of straw or mulch may help it get through the winter. I'm hoping that it survives again this winter. This little plant is one of the particular ones and proves that where you plant matters.

<https://www.gardeningknowhow.com/ornamental/flowers/verbena/rose-verbena-care.htm>

[Growing Rose Verbena – Learn About Rose Verbena Uses In Gardens \(gardeningknowhow.com\)](https://www.gardeningknowhow.com/ornamental/flowers/verbena/rose-verbena-care.htm)



What a significance wild flowers have, more than the tamed productions of the garden! They seem Heaven's own messengers sent straight to man to bear glad tidings of universal and undying love.

~Henry James Slack (1818-1896),
The Ministry of the Beautiful,
"Conversation XIII: A Rocky Lane in Summer," 1850





USDA-ARS Scientist Enlists Cattle to Create Fire Breaks



Scott Elliott and Kim Kaplan
Agricultural Research Service
in Research and Science
May 05, 2022

According to rangeland experts, wildfires in the western Great Basin region scorched more than 14,600 square miles in just 10 years—nearly the land mass of Maryland and Delaware combined.

It seems that a few herds of cattle could have helped prevent some of the devastation caused by wildfires.

A scientist from USDA’s Agricultural Research Service (ARS) is managing a research project that uses livestock to create firebreaks through targeted grazing. His program requires the cooperation of area ranchers to strategically target the grazing patterns of cattle. The goal is for livestock to eat extensive strips of highly flammable cheatgrass down to 2- to 3-inch stubble. This reduces the fuel load that could otherwise turn small rangeland fires into megafires in just a few hours.

“Wildfires have become more frequent, threatening human lives, property, and critical

natural and cultural resources,” said Pat Clark, a rangeland scientist based at the ARS Northwest Watershed Research Center, in Boise, ID. “Suppressing wildfires costs more than \$2.4 billion annually across all wildlands.”

“The current experiment involves projects in Idaho, Nevada, and Oregon,” Clark said. “Timing of the grazing is critical and is complicated by the dynamics of weather, plant growth cycles, and livestock herd management.”

In just 4 years, targeted grazing has intercepted three wildfires around Elko, NV. Preventing these fires conserved wildlife habitat, recreational opportunities, and other ecosystem services.

[USDA-ARS Scientist Enlists Cattle to Create Fire Breaks | USDA](#)



I found this plant in my garden next to the house. I have no idea where it came from. It has square stems and very small red flowers. The small wasps seem to like it. I am delighted to report what The Xerces Society says:

The odds are pretty good that you’ve never encountered **figwort**, or if you have you’ve taken no notice. Hopefully, after reading this you will seek it out. Figworts are amongst the most prolific nectar producers in the plant world. If the common name of ‘figwort’ doesn’t endear you to it, perhaps you will prefer to call it “Simpson’s honey plant” as it was known in the 1880’s when it was mass-planted in parts of the Midwest where beekeepers claimed a single acre could produce 400 to 800 pounds of honey that was prized for being light, clear, and aromatic.

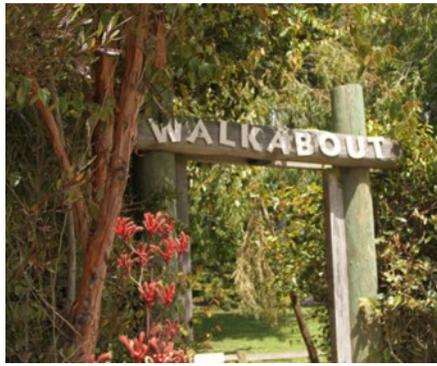
The plants themselves may look particularly “weedy” with tall, gangly flower stalks and fairly inconspicuous two-lipped flowers (shaped like honey pots!). While they may not be as showy as other wildflowers, discerning horticulturalists will find interest in the flowers simply for their uniqueness. Figworts tolerate partial shade and wet conditions, making them excellent for planting in rain gardens or along stream banks. Figworts attract a huge number of bees, wasps, flies, and hummingbirds – especially when planted in large clusters.

Native Range: Only a few species are native to North America. Late figwort (*S. marilandica*) is only native in eastern states, whereas lance-leaved figwort (*S. lanceolata*) is more broadly distributed across North America.

Best for: Providing an abundance of nectar for pollinators, attracting beneficial predatory wasps.

MN Carmen Santos



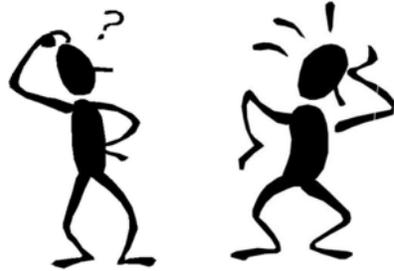


AT Fall Walkabout With Dan Billman

The Horticulture Answer Man
Look for more details and the
sign-up at the September
meeting!

Dan Billman, an ISA Certified Arborist who some of you might know from Forest ReLeaf, has volunteered to lead a fall walkabout. He'll be giving the lowdown on Missouri trees and shrubs as you trip happily along the trail. It will qualify for AT hours.

Dan Billman holds Bachelor's and Master's degrees in Plant and Soil Science. He taught 19 years at St. Louis Community College at Meramec in the Biology — Horticulture department as an assistant professor. Prior to joining Forest ReLeaf, Dan was Assistant Manager at Kirkwood Gardens. He has hosted his popular Walkabouts for more than 20 years.



Satisfy Your Curiosity!

The AT Committee is looking for a few new members. You can expect to help with:

- AT training strategy + topics
- Recruiting speakers as part of the AT Committee
- Be a contact for speakers

For more information talk to Co-chairs Deborah Moulton/Frank Dvorak



*Happy who for a season may
Absent themselves on buoyant wing!
The birds that Winter drives away
Will surely come again with Spring.*

*They of our ills will mindful be,
And when at length the storm has
passed,*

*They will return to this same tree
Which has so often felt the blast.*

*Then to our fertile vale will they
A more auspicious presage bring!
The birds that Winter drives away
Will surely come again with Spring.*

~Pierre-Jean de Béranger (1780–1857),
"The Birds," translated from the French
by Percy Reeve, in Love & Music, 1883

MN Deborah Moulton
discovered this amazing bird
migration dashboard for Mis-
souri (or other areas)

[https://dashboard.birdcast.info/region/
US-MO](https://dashboard.birdcast.info/region/US-MO)

How many crossed MO last night?

The new BirdCast Migration Dashboard provides summaries of radar-based measurements of nocturnal bird migration, including estimates of the total number of birds migrating, their directions, speeds, and altitudes.

This tool depicts migration patterns in near real time or as a summary of a whole night after nocturnal periods end (2021-present); this includes additional historical information (2013-2021) as well as previous nights' movements. The dashboard currently provides data for counties and states in the contiguous US, complementing our existing forecast and live migration maps but allowing you to explore nocturnal bird migration in ways that were previously impossible. As your explorations begin, discovering interesting, new and previously unknown patterns will be, perhaps, the most exciting aspects of the new tool!

This tool presents a number of different measures of bird migration, and the descriptions provide some basic information and guidance for interpreting these appropriately. Type in the county or state of your choice in the contiguous United States, select a date during migration seasons in 2021 or 2022, and begin!





Right Down a Rabbit Hole With the Monarch Butterflies

MN Mary Meinhardt

It's funny how a little blog/article can lead you from one story to another and sometimes raises more questions than you ever had before.

This short blog, <https://blogs.ifas.ufl.edu/santarosaco/2022/07/01/tropical-milkweed-in-north-florida/>, by Joshua Criss for the University of Florida, Institute of Food and Agricultural Ser-



vices Extension in Santa Rosa County, Florida was just such an article. It noted how the Tropical milkweed (*Asclepias curassavica*) often gets a bad rap for carrying *Ophryocystis elektroscirrha* (OE), a protozoan parasite that can hinder pupa emergence and shorten the life span of our beloved monarchs (*Danaus plexippus*) as well as the Queens (*Danaus gilippus*) and the Soldier (*Danaus eresimus*) butterflies that all host on milkweed. According to a Georgia study cited by the author, a large percentage of wild monarchs have OE and the OE spores are passed along to milkweed leaves when the infected butterflies land to nectar or lay eggs. The spores remain on the leaves and the new baby caterpillars ingest any/all parasite spores that may have fallen on the egg shell itself and on the leaves it eats.

It is good to know that "in the Eastern United States less than 8 % of the monarchs have a HEAVY spore load but in the southern tip of Florida where Monarch fly and lay eggs all year, more than 70% have a HEAVY OE load. Experts estimate that nearly 100 % of wild monarch of the Miami/Dade area of Florida are infected with OE ranging from a mild to heavy infection." (<https://butterfly-fun-facts.com/oe-ophryocystis-elektroscirrha-monarch-butterfly/>)

So what is a mild/moderate/heavy infestation? According to the same "fun facts" listed above, butterfly breeders use a 0-5 rating system with 0 being "no spores

at all on the body or scales of a butterfly " and 5 being heavily infested with hundreds and hundreds of spores on just one scale. See:

<https://www.internationalbutterflybreeders.org/infected-monarchs-look-like/>

[What do infected Monarchs look like?](https://www.internationalbutterflybreeders.org/infected-monarchs-look-like/) - [International Butterfly Breeders Association](https://www.internationalbutterflybreeders.org/)

for information on how to test butterflies for OE spores.

It is important to know that infected butterflies can spread OE spores just by hovering over a milkweed plant since the spores fall like glitter, landing on eggs as well as on the leaves. The hatching caterpillar eats its own egg shell and contaminated leaves. From even one spore, the caterpillars is infected and the spore breaks open in the caterpillar's gut and the parasite then moves to just under the skin where it duplicates asexually, each individual duplicating many times, thus weakening the growing caterpillar. When the caterpillars puppets, the parasites begin to duplicate sexually with spores forming three to four days before the adult butterfly emerges, and then exists both on the outside body and wings of the emerging butterfly (and also the inside of the empty chrysalis)— ready to infect the next generation, via spores.

The OE study was done in Georgia at the University of Georgia Agricultural Center at Wormsbe, outside of Savannah, Georgia in experimental garden plots planted with tropical milkweed. The gardens were monitored from May to October 2015, and the study found that levels of monarchs infected as caterpillars went from very low levels in May to nearly 100% by October. "For monarchs that emerged initially as uninfected adults, 81% had acquired OE spores from infected adults by the end of the study period. Also the proportion of milkweed leaves receiving spores rose from 0 to roughly 75% over that time." (<https://news.uga.edu/monarch-butterfly-parasite-strategy-infection/>)

Floridians have 21 different spe-



cies of native milkweed to choose from; however, the one most available in garden centers is Scarlet or Tropical Milkweed (again, *Asclepias curassavica*), which does not die back in the South Florida, and is believed to be a factor in keeping a large group of non-migratory monarchs in the area.

Joshua Criss encourages Floridians to "cut this plant within four inches of the ground once flowering has ceased in autumn (generally around Thanksgiving.)" and to plant natives.

Apparently, from OE studies, native milkweed leaves also get contaminated with OE spores, but the fact that milkweed all die back over the winter breaks the vicious cycle of contamination and re-contamination. If you follow people on the internet who raise monarchs, you may see that they report more disease/OE as the year progresses. People who raise monarchs are not encouraged to get caterpillars but to start at the egg stage and to use bleach to clean both the eggs and the leaves that will be fed to the caterpillar, thus ensuring parasite-free butterflies. See <https://butterfly-fun-facts.com/oe-ophryocystis-elektroscirrha-monarch-butterfly/> for specific guides.

The author encourages his Floridian readers to raise native milkweed as the best solution and to cut the tropical milkweed in fall. He notes that over the 2021-22 winter resting grounds a 35% increase was noted according to the World Wildlife Foundation.

But WAIT!!!!—I heard that monarchs were very recently—July 22, 2022—placed on the endangered list???? What about THAT???

Yes, the monarch has recently been listed as endangered by the International Union for Conservation of Nature, based in Gland, Switzerland. Of most concern are the group of monarch on the west coast that spends its winters in coastal California and flies to states west of the Rockies in the Spring. They have declined 99.9 % between the 1980's and 2021. The World Wildlife Fund and our own monitoring agency, the US Fish and Wildlife Services (FWS) have been monitoring the declining migrating monarch species since at least 2014 and each time, the FWS has judged the endangered title to be "warranted but precluded" meaning other species were of a higher priority for protection under the federal Endangered Species Act. Once included as a priority on these lists, a greater amount of money, effort, and coordination is expended by the listing agencies. Who knew ??? I did not!

<https://wildlife.org/iucn-lists-monarch-butterflies-as-endangered/>

<https://www.iucn.org/press-release/202207/migratory-monarch-butterfly-now-endangered-iucn-red-list>

<https://wildlifemanagement.institute/outdoor-news-bulletin/january-2021/us-fish-and-wildlife-service-finds-endangered-species-act>





Master Naturalists in Action

Green House Construction (photos by Frank Dvorak)



Getting it just right ...

The Missouri Parks Association

MN Frank Dvorak

Our Advanced Training speaker for the September chapter meeting will be Shirley Wolverson, who will describe advocacy by the Missouri Parks Association for Missouri's state parks and historic sites.

The Missouri Parks Association (MPA) is a non-profit citizens organization dedicated to the protection, enhancement and interpretation of Missouri State Parks and Historic Sites. Founded in 1982 at a time of financial crisis for the park system, MPA has been a steadfast supporter and tireless defender of the state park system. The association's members and volunteers continue to support the three-fold mission of the Missouri state park system through education and advocacy and remain vigilant to prevent actions that threaten our parks.

The mission of the state park system is to preserve and interpret the state's most outstanding natural landscapes and cultural landmarks, and to provide outstanding recreational opportunities compatible with those resources.

Ensuring Missourians understand the need for an adequate and consistent base of financial support for the park system is a key task. In 1984, MPA spearheaded the petition that led to the passage of the Parks, Soils and Water Sales Tax and has worked to get it reapproved by voters in 1988, 1996, 2006, and in 2016 when it passed by 80 percent with a majority in every county in the state!

In addition to park funding, and to ensure an excellent state park system that is relevant for all Missourians, we strive to connect Missourians to the outdoors, with a priority on underserved populations, including urban and rural youth and seniors.

MPA is constantly looking for new ways to enhance the park system for enjoyment by citizens and visitors alike.



Corn Clubs became popular in the early 1900s. A corn club was a local organization of farm boys who cultivated one acre of corn under the direction of a club leader. The U.S. Department of Agriculture and agricultural colleges cooperated with rural schools to educate

both the farmer and his son(s) in better agricultural practices. Increased production of corn was one outcome of the club's work.

This photo of a club member sitting on a prize yield of corn is from the library's [Elsie Carper Collection on Extension Service, Home Economics, and 4-H.](#)

Other historic photographs of corn are available in [Special Collections](#)





From Our Members

Frank's Two swallowtail larvae on his small Sassafras. They have consumed many of the leaves. Too bad they don't like milkweed since there is more of that.



Spicebush Swallowtail Butterfly

The spicebush swallowtail butterfly, *Papilio Troilus* is relatively common in natural areas and flower gardens throughout most mid-western states. It is an attractive butterfly, and the US Postal Service issued a commemorative stamp with its likeness.



Linnaeus grouped some swallowtails and other butterflies under the genus name *Papilio* coupled with the names of heroes from the Trojan War. *Troilus* was the son of Priam, king of Troy in Homer's *Iliad*.

The butterfly's common name, spicebush swallowtail, implies spicebush as the host plant for the larvae, though other plants in the laurel family also are hosts. Sassafras is an alternate host plant in our area.

I purchased a small sassafras plant from Missouri Wildflowers Nursery in June. I set the pot in my garden bed for now, and plan to plant it in the ground this fall. After about a week, I gave it a closer look. Was something eating the leaves? Then I noticed this odd form on a stem. Wow!! I think it is the larvae for a swallowtail butterfly. It probably came with the plant and recently hatched. Thanks MO Wildflowers!



Did you know that our own Frank collects antique Door Knobs? Here he is at the latest convention,

Frank's Insect Friends



Green bee on Culvert's Root



Spider on Butterfly Bush



MN Sue Stevens



Great Black Wasp, 1 1/2 inches long



Swallow Tail Larvae on Fennel





From Our Members

MN Elaine Browning's
Hard Working Garden/Yard
Where All the Wild Things Thrive!





From Our Members



I have a love affair with the bumblebees on my garden's native plants. Here are two.

BB on Aromatic Aster and Gray Goldenrod

BB on Fall Glade Onion

MN Deb Moulton



Monarchs like Iron Weed too.

MN Frank Dvorak



MN Leslie Limberg

Can you spot the Monarch eggs?



I noticed a flash of red in the morning sun out back a few days ago, when we had sun. I used my binoculars and telephoto camera to confirm I was seeing red blossoms of cardinal flower.

I am growing cardinal flower in my back garden, and I had collected seed and scattered it in the common area several years ago. One cluster has become established, still 30 feet from the creek. It seems more seed was spread over time and has taken root at the edge of the creek. I definitely did not go down to the edge of the creek to scatter seed! Then I thought back to the heavy rain we had in July. The creek flooded and knocked over substantial stems of cup plants. How did the cardinal flower survive, and come into full bloom? Nature finds a way.

See the storm water and cardinal flower blossom photos. Use the sycamore tree trunks as a reference, one leaning and one broken. The cardinal flower plants were obviously under water and in danger of washing away. Yet they survived and produced flowers.

MN Frank Dvorak





Let's Talk Turkey

Turkey Tangle Foot, that is ...
And a few other unappreciated
ground covers

MN Mary Meinhardt

MN Elaine Browning took a photo or two of the Lanceleaf Frogfruit (*Phyla lanceolata*) found on the grounds of the University of Missouri Extension Center on Brown Road and found some wonderful



Lanceleaf frogfruit
Elaine Browning

information to share with us. The frog fruit was found exactly where it floods, but that doesn't matter much to this *Verberna* cousin that can survive under water, in baking heat or

in a bit of shade. It is native to southwestern Canada and most of the United States, southward into Mexico. It is most commonly found in sun and in moist soils, along shores, and flood plains and in muddy flats. It blooms June through September. Cuttings, taken in late spring through summer will root readily from the nodes, and the plant also transplants well. The sprawling stems that grow up to 12" long, tend to fall over and root on the ground forming a low mat, thus being an excellent ground cover. The flower head is tiny (smaller than white clover) but has a purplish disc with the flowers whirling around the bottom. The individual flowers, if pollinated, will have an attractive cluster of orange-brown fruit, eaten by Canadian Geese, but not by deer or rabbits. The tiny flowers attract a huge variety of bees and small butterflies. It is the host for the Common Buckeye and Gorgone Checkerspot and two other butterflies not common to our area (Pharon Crescent and White Peacock). Although the Lanceleaf Frogfruit (or Frogfruit) is not typically called "Turkey Tanglefoot", its southern cousin (*Phylas nodiflora*), down in Texas is often called that fun name.

Perhaps you've tried the *Packera* family (*obovata* and *aurea*) as ground-covers? Both bloom in April with striking yellow blooms at a time when flowers are a bit sparse. The first one, *obovata* (Roundleaf Ragwort, Roundleaf Groundsel, Squaw weed), has notched spoon shaped oval leaves and can tolerate drier full sun conditions. It is compact and tends to stay that way under different conditions. It will naturalize into large colonies in optimum growing conditions by self-seeding and by stolans. It typically grows four to six inches tall with 10-16" flower stalks and lots of

yellow blooms. It is songbird and pollinator friendly and blooms well in sun or shade. There is a mildly toxic compound in its foliage and some people may have a mild reaction from touching its leaves. It prefers limestone based soils, will be happy near a sidewalk or a foundation, or in rocky glades, but is actually quite adaptable even in our natural clay soils.



Its cousin, *aurea*, (Golden Grousel, Golden Ragwort, Butterweed)

tolerates wetter soils and even seasonal flooding. Its growing habits are somewhat more "open" or weedy and its leaves are heart shaped with green above and purple below. It blooms in April and grows well in moist woodlands. There are actually 16 different species in the *Packera* family, many of them evergreen during our winters. Both of these species are available commercially, and like our Common Violet, you may have to "edit" them after a few years because of their prolific tendencies.



And what about Pussytoes (*Antennaria*) as a ground cover? Here in Missouri there are at least two species that are available commercially. Grow Native and Missouri Wildflowers Nursery promotes *Antennaria parlinii* for savannas and woodlands. The plant is a herbaceous perennial that blooms in February to April with dainty white flowers that look like cat paws. The plant thrives in medium sun to average shade in dry to moderate soil. This plant and its cousins are deer resistant with silvery green oval fuzzy foliage which lies flat on the soil surface. It can reach 6-10 inches when blooming, attracts butterflies, pollinators and beneficial insects. It easily spreads 6-12" in a short amount of time. Its recommended use is in large containers as fillers and between plants in perennial beds.

Antennaria neglecta (Field or Prairie Pussytoes) is also sold by Missouri Wildflowers Nursery. It is an excellent rock garden plant which likes hot dry areas, prefers full or partial sun and medium to dry well-drained conditions. Prairie pussytoes is shorter (four inches for *neglecta* and six inches for *parlinii*) and can only handle light shade as opposed to medium shade for *parlinii*. Both are host plants to American Painted Ladies. Neither plant

likes wet-areas. Pussytoes have a neat compact growth and spread somewhat slower than the *Packera* family.

One other common ground cover for use in moist shade is Wild Ginger (*Asarum canadense*) which is native throughout the Eastern United States and southeast Canada. It grows about six inches tall in rich, slightly acidic soils and blooms April to June. Unless you specifically look for the blooms, you will probably never notice the distinctive dark bell shaped red or brownish mauve flowers with three small tips that flare out from its edges and are hidden at the base of the plant. It is believed that this placement helps early spring insects find the flower for food and pollinating. Ants carry its seeds underground for germination and unbelievably the pipevine swallowtail is a pollinator, since this flower as well as the Dutchman's Pipevine flower emits a scent of decaying fruit. The leaves are strongly veined, leathery with a shiny surface and occurs throughout Missouri on rich wooded bottomland and upland slopes, along banks and terraces of streams and rivers. Wild Ginger forms dense colonies in the understory of forests. It is hardy to zone 4 and needs the cold cycle to complete its life cycle, not flourishing above zone 7. It doesn't need much sun and its leaves will burn if it gets direct sunlight. It doesn't usually need extra watering if it has compost and good drainage. It is important that the leaves may cause dermatitis in some people. The roots have been used as a ginger substitute and was also used medicinally to treat several maladies.

If you haven't ever used "ground covers" in your gardens as a substitute for "mulch", you might want to consider a few of these under appreciated plants as "green mulch" to prevent weeds and to provide root shade for your taller plants.

For more information about using natives as ground cover go to:
<https://chosenatives.org/articles/plant-native-ground-covers-make-america-green/>

Other Resources:

<https://www.clayandlimestone.com/2018/06/wildflower-wednesday-lanceleaf-fogfruit.html?m=1>

<https://www.northcreeknurseries.com/index.cfm/fuseaction/mobile.plant/ID/728/index.htm>

<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=I350>

<https://www.prairienursery.com/field-pussytoes-antennaria-neglecta.html>

https://grownative.org/native_plants/pussytoes/

<https://www.thespruce.com/wild-ginger-plant-profile-4843271>

<https://mdc.mo.gov/discover-nature/field-guide/wild-ginger>





Genetically Modified Corn Does Not Damage Non-Target Organisms

A new major meta-analysis has found that Bt corn does not damage nontarget organisms.

(Photo by Preston Keres)

The largest, highest quality analysis of data ever conducted reveals that genetically modified Bt corn has little impact on nontarget insects and other organisms, especially compared to growing conventional corn. This study was published today in *Environmental Evidence* by a USDA Agricultural Research Service scientist and his Swiss colleagues.

Bt corn is corn that has been genetically modified so that it produces proteins from the bacterium *Bacillus thuringiensis* to control corn borers, corn rootworms and other major pests of corn. The first Bt corn was approved in 1996 and critics have been suggesting that it also can destroy beneficial insects or other non-targeted organisms.

One of the issues with assessments of possible nontarget organism damage by Bt corn has been that each study was limited in scope, environment or size. The paper's three authors have made up for these shortfalls by systematically pulling together data from studies in 12 bibliographic databases, 17 specialized webpages, and the reference sections of 78 review articles that all met the highest standards for research quality.

"We gathered together hundreds of individual studies published between 1997 to 2020 that have looked at whether growing Bt corn changed the environmental abundance of non-target animals such as arthropods, earthworms and nematodes, especially as compared to growing non-genetically modified corn accompanied by the pesticide



necessary to control major pests," explained ARS entomologist Steve Naranjo, director of the Arid-Lands Agricultural Research Center in Maricopa, Arizona and one of authors of the study.

Naranjo and entomologists Joerg Romeis and Michael Meissle with Agroscope, ARS' Swiss counterpart, found that this massive aggregation of data showed Bt corn had no negative effects on most invertebrate groups including ladybeetles, flower bugs, and lacewings. Populations of Braconidae insects, which are parasitoid wasps that prey on corn borers, were reduced with Bt corn.

The researchers even examined if authorship or financial support by biotechnology companies affected the outcome of individual studies.

"It might be a bit surprising but according to the analysis, when any negative effects by Bt corn on nontarget organisms were found in the data, they were attributed more often in studies with private sector support than when no backing by biotech companies was declared," Meissle added.

"But after all the number crunching was done, what we found was that, overall, Bt corn just does not have negative impacts on nontarget organisms," said Naranjo. The quality standards for which studies would be included in the meta-analysis and which would be cut were outlined and vetted by stake-

holders, scientists not involved in the meta-analysis project and even members of the journal's review board, none of whom knew if any study's data showed a negative impact on non-target organisms or not.

The result is the largest pool of high-quality data anyone has ever analyzed for this purpose consisting of 7279 individual invertebrate records from 233 experiments in 120 articles, 75 percent of which were from peer-reviewed journals. The entire data set also has been published in *BMC Research Notes*.

In summary, this major meta-analysis largely proved out previous individual studies. Bt corn represents a highly selective pest control technology with relatively few negative consequences for non-target invertebrates, especially when compared with the use of broad-spectrum insecticides for managing Bt-targeted pests, according to the scientists.

The Agricultural Research Service is the U.S. Department of Agriculture's chief scientific in-house research agency. Daily, ARS focuses on solutions to agricultural problems affecting America. Each dollar invested in agricultural research results in \$17 of economic impact. U.S. DEPARTMENT OF AGRICULTURE, Agricultural Research Service





Thank You!



☞ MN Leslie Limberg and Joann Shrew for their dedication to the Quail Ridge Prairie Demo Garden by faithfully watering the gardens during the hot "Dog Days of Summer".

☞ To the Quail Ridge and O'Fallon Project Teams (Currently Frank Dvorak, Joann Shrew, Leslie Limberg, Elaine Browning, Beth Zona, Jane Porter, and Carmen). Your dedication is unsurpassed. And the teams welcome Mary Meinhardt and Sandy Oilfield—thank you Sandy and Mary!

☞ Thank you to all our members who came together and answered the call for help with the greenhouse constructions at UM Extension. There were diggers of

trenches, levelers, construction supervisors, assemblers, rock, dirt and sand fillers, and panel tapers, and all with a deadline to meet. Well done! If you are able to attend, please come to the open house on Thursday, September 15 at 4:30 pm and see our new greenhouses.

☞ Thanks to our members who stepped up to help with training the new MMN's, Class of 2022. You are awesome!

☞ Thanks to the outgoing chapter officers for their contributions to our chapter and a job well done, as well as to those that will take on new leadership positions. Good luck to all!

☞ Thank you to all the new MN (new members) for choosing the Confluence Chapter

☞ Frank Dvorak for your multitude of skills/projects.

☞ Tom Nagle for establishing 2 greenhouses for native plants on Extension property

☞ Volunteers Extraordinaire building our greenhouses: Elaine Browning Jean Harmon, Amanda Templer, Frank Dvorak, Mary Meinhardt, and especially the brute force of Paul Robbins, Lloyd Alinder & Gary Schneider. YOU GUYS ROCK!!!!



*So many friendly things are done
In this good world 'twixt sun and sun
That, do our kindest day by day,
We cannot half our debt repay.*

~Oliver Marble Gale (1876-1943)

To Make a Prairie (1755)

*To make a prairie, it takes a clover and one bee.
One clover and a bee, And revery.
The revery alone will do, if bees are few.*

—Emily Dickinson —Poet 1830-1886



Our Leadership

- President—Alison Robbins
- Vice President—Stephen Baldwin
- Secretary—Beth Zona
- Treasurer—Jean Crinean
- Advanced Training—Deborah Moulton
- Volunteer Coordinator—Alberta McGilligan
- Membership Services— Tom Holt
- Facebook Page—Gail Gagnon
- Newsletter—Carmen Santos, Leslie Limberg, Elaine Browning, and Mary Meinhardt



Project Leaders:

- Confluence Chapter Stream Team #3612—Gary Wester
- Babler State Park—Alberta McGilligan
- Quail Ridge Prairie Demo and Rain Garden—Carmen Santos
- Bluebird Monitoring—Connie Campbell and Leslie Limberg
- Nature Explore Classroom Education—Connie Campbell
- O'Fallon Public Works Project—Carmen Santos
- Monarchs & Pollinators Network—Bob Lee and Tom Holt
- Birding Club—Gail Gagnon
- Main Street Garden—Martha Hessler and Tom Nagle
- Daniel Boone Hays Seeding—Phil Rahn —Bob Coffing
- Matson Hill Park—Bob Coffing
- Cuivre River and Don Robinson State Park—Bob Coffing
- Outdoor Classroom, Frontier Middle School—Jeanice and Jerry Kaiser

- Amphibian Monitoring—Steve Teson
- Wetlands for Kids—Glenn Bish and Rob Merriman
- Native Seed Collection & Distribution—Phil Rahn and Leslie Limberg
- Native Flower Potting & Distribution—Alberta McGilligan
- Rockwoods Reservation Native Garden—Karin Foster and Nancy Newcomer
- Belleview Farms—Alberta McGilligan
- Progress South Middle School Garden Clean Up - Leslie Limberg

Past Presidents

Connie McCormack
Scott Barnes,
Jerry Lindhorst
Cliff Parmer
Leslie Limberg
Alberta McGilligan
Martha Hessler

The Confluence Chapter was founded in 2005 as the fifth Master Naturalist chapter in Missouri.

The chapter was formed by twenty-four individuals from St. Charles County, St. Louis County, and St. Louis City after completing the Missouri Master Naturalist™ training program. We share a common interest in nature and in volunteering to help protect, preserve and restore Missouri's natural heritage. Most of our members live in the region west of the Missouri-Mississippi Confluence and from both north and south of the Missouri River.

We operate according to the bylaws and operating handbook of the Missouri Master Naturalist Program developed by the Missouri Department of Conservation and University of Missouri Extension. Visit us at <http://www.mmnconfluence.org/>