Missouri Master Naturalist™
Confluence Chapter St Charles County, Missouri
Your Key to Discovering the Natural Missouri
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## From Our President

I have a confession to make- I am not a big fan of winter. As I am writing this, it has already snowed for a week, another storm is coming and I am just plain cold! So I was somewhat amused to see that in the February 2021 Missouri Conservation magazine, there were a couple of "reminders" that winter is not such a bad season. Sara Parker Pauley shared with us a quote from writer Katherine May—"Once we stop wishing it were summer, winter can be a glorious season … a time for reflection and recuperation, for slow replenishment, for putting your house in order." On the back of the magazine, there is a note to take a hike, go fishing, grab the binoculars and birdwatch.

Ok, ok. I get it. Winter is a season that is necessary. To help me get through it, I thought I would make a list of why I should like it.

Here goes:

- My son was born in January. (Although the day he was born, it was 70 degrees outside!)
- I do love a good winter sunset. The stark trees against a pinkish orange and blue sky is just beautiful.
- The birds around my feeder make me laugh. I keep yelling out my back door to "share, everyone".
- Winter is a good excuse to make more soups for dinner. Fortunately, my husband likes soup too!

As a chapter in this time of COVID-19, we, too, have slowed down. Two of our big events, Eagle Days and Winter in the Woods didn't happen. But there were some other opportunities that came up. Some of you worked at the Audubon Center at the Riverlands during their Eagle and Raptor days. Some of you are monitoring eagles nests located in several counties. Stephen Baldwin has been working with Towne Park (St. Charles County Parks) to put up 6 new bluebird houses up for our state bird.

So try to find some joy in this cold and snow. I will see everyone at our next zoom meeting, but like most of you, I really want us to get together in person as a group.

And lastly, one of the good things about winter is that spring is not far away!

*Alison*

Alison Robbins
President, Confluence Chapter

## Missouri Master Naturalist 2021 Certification Pin

Eastern Meadowlark
*Sturnella magna*

A familiar bird, known by the black "V" on its chest when it sings from a fencepost, or by the flash of white tail feathers when it flushes from the grass.

Adults have yellow underparts with a black "V" on the breast and white flanks with black streaks. The upperparts are mainly brown with black streaks. They have a long pointed bill; the head is striped with light brown and black.

Their breeding habitat is grasslands and prairie, also pastures and hay fields. This species is a permanent resident throughout much of its range, though most northern birds migrate southwards in winter.

These birds forage on the ground or in low vegetation, sometimes probing with the bill. They mainly eat arthropods, but also seeds and berries. In winter, they often feed in flocks.

Nesting occurs throughout the summer months. The nest is also on the ground, covered with a roof woven from grasses.

The numbers of this species increased as forests were cleared in eastern North America. This species is ideally suited to farmland areas, especially where tall grasses are allowed to grow. -type areas.

The song of this bird is of pure, melancholy whistles.

# Awards and Recognitions

Awards: Multi-talented Master Naturalist Frank Dvorak, a recent transfer from the Hannibal MN chapter, has completed 500 hours of service and will receive the pewter pin.

Way to go, Frank!


## Parasite Hijacks Iron in Honey Bees

ARS News Service

An Agricultural Research Service entomologist has discovered the *Nosema ceranae* parasite that causes major problems and death in honey bees works by hijacking its host's iron for itself.

Iron is as essential a micronutrient for honey bees as it is for people. Honey bees usually get enough to meet their needs from their flower pollen diet. They use iron in their immune system and for reproduction and development. As does Nosema ceranae.

"In a number of mammal species, there is an iron tug-of-war between host and pathogen that is part of the central battlefield that determines the outcome of an infection. But this has not been explored before in honey bees and not with Nosema," explained entomologist Yan Ping "Judy" Chen. She is with the ARS Bee Research Laboratory in Beltsville, Maryland.

When Chen tracked iron in N. ceranae-infected honey bees, she found iron is also a part of the honey bee's physiological struggle with the parasite, as it is in the mammalian system.

If honey bees lose the battle of infection with N. ceranae, the gut parasite begins to hijack the iron in the flower pollen that the honey bee has eaten before the bee can absorb it, diverting the iron into its own spore reproduction.

How the N. ceranae does that involves a protein called transferrin that, in honey bees, is responsible for binding and transporting iron from pollen out of the gut and throughout the bee. N. ceranae uses the honey bee's transferrin to divert the iron to its own use, causing the honey bee to produce more and more transferrin as the bee's system becomes more and more starved for iron.

"This only results in greater iron deficiency for the honey bee as the increasing transferrin level just gives the N. ceranae the opportunity to scavenge even more iron from the bee host for its own proliferation and survival," Chen said.

She further found that reducing transferrin production was accompanied by reduced iron loss and improved immune function and improving survival of N. ceranae-infected bees.

Since there is no truly effective treatment for N. ceranae, this study suggests a welcome possibility for a new treatment that might be based on regulating iron or the synthesis of transferrin, Chen added. This will be of interest for beekeepers, researchers, and policymakers worldwide.

N. ceranea is one of the major parasite problems causing beekeepers' colony losses today. It is a microsporidia, a member of a group of single-celled parasites closely related to fungi. Originally, N. ceranae was a parasite only of Asian honey bees (Apis cerana). But in the late 1990s, it jumped species to the European honey bees (Apis mellifera) that we have in this country.

*The Agricultural Research Service is the U.S. Department of Agriculture's chief scientific in-house research agency.*

# Northern Harrier

MN Jerry Lindhorst

*(This is the 3rd in a series of articles on Keystone Species in Missouri. Such species are living things that play a critical function in preserving the structure of our natural community. They can be any organism ranging from animals to plants to bacteria and fungi. Without these keystone species, the ecosystem would be dramatically different or cease to exist altogether.)*

Its been a long time since I have last spotted a hawk fluttering its wings and hovering above an unsuspecting mouse scurrying in a field when I was rabbit hunting.

I recently learned the hawk I used to see was a Northern Harrier Hawk and it is now on the endangered-species of concern list in Missouri.

Its common name is a form of the word harrower, which means "pillager" or "plunderer." From the perspective of their prey, that would best describe this hawk's attack from above. America's ferocious U.S. Harrier Jet is named after this hawk.

These Harrier Hawks are approximately 18-22 inches long with wingspans running from 40-47 inches. The males have long wings and tail. The female is brown and streaked below; the male is gray above and white below. You can hear their high whistle and bark calls.

Interestingly, the Northern Harriers have round faces similar to owls. This facial construction functions like a sonar disk by channeling sound waves to their ears. This helps them hear the rustlings of their prey hiding beneath vegetation. These hawks are not related to owls.

Northern Harriers, also called Marsh Hawks, are more often seen over prairies, shallow marshes and hay fields as they prefer open areas to hunt for rodents, birds, snakes, lizards, toads, frogs and insects.

Smoke is a signal for them to hunt. During the spring and fall, grassland or crop stubble fires help provide an easy meal for the hawks as their food source scurries away from a fire's threatening heat and smoke.

The Harrier Hawk arrives in Missouri in March to April and nests late in the season on the ground in undisturbed marshes, prairies, and pastures and on elevated ground in low stubby vegetation, tall weeds or reeds, according to the MDC. Their young are fledged in approximately 5 weeks.

In the last 50 years, the Harrier Hawks have been declining due to wetlands being drained, native prairies being converted to agriculture, reforestation of grasslands and mowing or haying of grassland when the hawks are nesting.

Northern harriers hover over one spot, then plunge feet-first into the vegetation to capture prey.

Northern Harrier Male

Northern Harriet Female

Photos by MDC Staff, courtesy Missouri Department of Conservation.

# Winter Thoughts

It is the dead of winter. I have a few evergreen plants in my yard and most everything else is dead or dormant with no color, and the leaves are gone from the stems.

The boxwood by my porch is still mostly green since it is sheltered under the eaves. A holly bush by the garage has green leaves, and some ornamental evergreens.

What else?

To my surprise several coreopsis plants have green leaves and look brighter than the boxwood. Several lambs ear plants (planted by the previous owner) down by the milkweed patch, have rather bright green foliage.

Wow!

The blackberry vines in the side yard have retained some leaves that have faded into a reddish brown, same as the rose in front.

Is this a family trait?

The foxglove beardtongue has basal leaves that were green but have faded to reddish brown.

MN Frank Dvorak

He who marvels at the beauty of the world in summer, will find equal cause for wonder and admiration in winter....

In winter the stars seem to have rekindled their fires, the moon achieves a fuller triumph, and the heavens wear a look of a more exalted simplicity.

~John Burroughs, "The Snow-Walkers," 1866

# Did you know?...

◎ That all food webs on land depend upon insects?

◎ Insect abundance has decreased globally by 45% since 1974.

◎ National Geographic ran an article "Where have all the insects gone" in May, 2020 which can be found at this link https://www.nationalgeographic.com/magazine/2020/05/where-have-all-the-insects-gone-feature/

◎ Caterpillars provide more energy from plants to animals than any other insect!

◎ Migratory birds will stop migrating when they determine there aren't enough insects to make the risks of migration worthwhile.

◎ There are not enough insects now to support migratory birds and the birds that reside here.

◎ Specialist bees (our native solitary bees) pollinate native flowering plants which maintains plant diversity and they need our help also.

◎ There currently aren't enough functional wild areas to support caterpillars (a major food source for birds) and specialist bees.

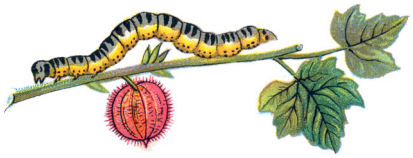
◎ Invasive exotics, over 3,300 species, are causing the most harm to natural areas.

◎ 5% of native plants provide 75% of the food that drive the food webs on land, and they are known as Keystone species.

◎ Doug Tallamy stated that oaks are the most powerful plant because they support the most caterpillars and other insects.

◎ Oak acorns are an important food source for bears, northern bobwhite, quail, white-tailed deer, small mammals, and wild turkey.

◎ Trees should be pruned to one central trunk, with major branches trimmed to keep branch diameter less than ½ the trunk diameter.



## Introducing AskUSDA

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## *Fungus Commits Floral Fraud to Fool Insects into Spreading It*

Think fungi are little more than moldy growths?

Guess again. Scientists found one that creates fake flowers to attract insect pollinators.

The spores of some fungi can linger in the environment for months or years just waiting for something to spread them elsewhere, like a gust of wind, falling rain, or a passing insect or animal. Not so with *Fusarium xyrophilum*, a fungus found growing on two types of yellow-eyed grass in the savannas of Guyana, South America, and reported in the December 2019 issue of Mycologia.

Rather than passively waiting for its spores to be carried off, *F. xyrophilum* transforms itself into colorful, petal-like structures that mimic the yellow flowers of its host plant, likely tricking pollinators such as bees to land on them. The fungus's fake flowers even emit a chemical aroma to further entice the hungry insects. But according to Imane Laraba, lead author of a published study conducted by a team of Agricultural Research Service (ARS), Purdue University and Smithsonian Institution scientists, instead of a pollen meal, visiting insects get a face full of spores before flying off.

There's a name for such floral fraud—"pseudo-flower formation"—and it's among the rarest outcomes of fungus-plant encounters known to science, the team reported in the journal of Fungal Genetics and Biology.

The yellow-orange coloring of the fungus's pseudo flowers contains two pigments that reflect ultraviolet light at ranges visible to bees, butterflies and other pollinator insects, thanks to specialized receptors in their eyes. Using gene-sequencing methods, the researchers also determined that the fungus infects the entire plant—from the roots up—and sterilizes it so that it cannot form its true flowers, which would draw the insects' attention away from the fungus' spore-laden pseudo-flowers.

The researchers theorize this self-sterile fungus evolved such tactics to increase the odds of its spores reproducing sexually with others in the environment, via a process called "outcrossing," as well as infecting new host plants.

Investigating the fungus's floral fraud was a team effort by all counts. Laraba collaborated on the effort via the USDA ARS Research Participation Program and the Department of Energy's Oak Ridge Institute for Science and Education.

Photo courtesy of Kenneth Wurdack, National Museum of Natural History, Smithsonian Institution.

# Heartfelt Thank You to Martha Hessler


Newly elected President Alison Robbins and past presidents Alberta McGilligan and Jerry Lindhorst, along with
Newsletter Editor Carmen Santos and her husband Russ, did a "drive by" thank you to outgoing president Martha Hessler at her home on Sunday, November 29.

Martha served as president of the Confluence Chapter from 2018 to December of 2020; admirably leading the chapter through this difficult pandemic year. Martha became a Master Naturalist in 2014 and is also a Master Gardener.

Photos and Article by MN Lee Phillion


MN Jerry Lindhorst

## Shortleaf Pine
## *Pinus echinata*

When I was in high school, a friend and I shared a love for the outdoors. My grandfather had a log cabin and 50-acres, and his family owned a high-end cabin tucked away in the middle of woods near Steeville, MO.

One weekend, I was invited to come with my friend and his father to their place, which had a spring-fed creek. I remember being really excited about exploring the woods on their property. While traveling, his father announced how happy he was to have me joining them this weekend and asked if I would be interested in helping him with a project.

"Sure" I offered. "How can I help?"

"In the trunk of the car, I have 150 pine trees to plant and hopefully we can get them all in the ground this weekend or they could die," he said.

Was he joking? I had not noticed any trees protruding from the car's truck. That would amount to each of us each planting 50 trees in a day and a half. There would be little time to explore. I was disappointed.

When we reached the cabin, my friend's father opened the car's trunk. There were three boxes filled with approximately 1-foot long pine trees.

"Are these the trees you want to plant?" I asked, somewhat astonished.

"Yes," he said, smiling. "These are short-leaf pine trees. They are the only native pine trees that grow in our state. They are beautiful as they grow and can reach 120-feet."

While much of their land was hilly and rocky, we were able to get all the trees planted. On the day we left, my friend and I had a short time to explore the creek. I remember looking up on several of the hillsides and seeing a number of the small pine trees we had planted and wondering if they would survive.

After graduating, my friend and I went our separate ways. Some 10-12 years later, I decided to revisit my friend's cabin to see what had happened to those pine trees. I found not many of them were standing. The ones which had survived, however, added so much beauty to the land that I felt very proud to have helped plant them.

These fast-growing short-leaf pine trees were once a dominant part of Missouri's forest ecosystem and a major tree in the state's forest products industry. They have a straight reddish-brown rough-barked trunk. Its leaves are needles 3-5 inches long, slender, flexible, straight, sharp-pointed and dark bluish green.

The tree's fruits are tiny seeds which are protected by a pinecone and form in September-October, maturing the second year. They are found on the branches, a brown woody cone in clusters of 1-3 about 1-2 ½ inches long and narrowly egg-shaped.

Thanks to conservation efforts, these magnificent pines are making a comeback in our state and shine in forests mostly throughout the southeastern and south central portions of the state.

**Photo by MDC Staff, Courtesy of MO Department of Conservation**

# Notes from the Field

(Commonly referred to as Field Notes)

Frank's Fox News

In this case a real fox was hunting mice in my back yard. This is the first fox I have seen in my yard since I have lived here. The fox was focused on catching a mouse which gave me time to grab my camera and take a few shots through the window. It is a beautiful animal with nice markings and rich red-brown coat.

## A Day On the Eagle Nest Watch

MN Allison Volk

A few of us from the chapter are volunteering as Official Eagle Nest Monitors this breeding season. Here is what happen today as I was out monitoring a nest out at Innsbrook Resorts.

I arrived about 1 pm and decided to head over to a known roost site. Just as I was crossing a dam, I looked to my left and saw two large soaring birds. I quickly pulled into a hiking trail lot and turned the car around.

The eagles were still soaring and I thought I might have just stumbled into a mating aerial courtship display. That is when they both soar really high, they come together and lock talons and fall from the sky turning over and over each other until at the last moment they release the grip and fly their separate way. I Have never seen this happen, so I was very hopeful.

There was no courtship display but one of the eagles started heading my way, and thru my binoculars I could see it was a sub-adult. The head was starting to grow its white feathers and the beak was mostly gold, not black and the tail feathers still have not grown completely white yet. After the sub-adult flew too far to see anymore, I drove over to the beach that they sometimes sit near, hoping to catch the other eagle that was flying near the one I was just watching. No luck after scanning the trees, so I headed over to the main event. Just as I knew I was in sight of the nest, I paused the car and looked over and a smile spread across my face as I realized I saw a white head. I went to my pull off spot and got the binoculars out. It is a normal parking spot, so nothing that the eagle has not seen before. I looked thru my binoculars and saw that the bird was low on the nest, indicating that it was either just lying down, which, they sometimes do, or laying on an egg or two, or three. I watched for about 10 minutes then decided to view the nest from another spot, so I left with the bird still lying down. It was a 5 minute drive, and when I pulled down to the beach I noticed that the bird was up and looked like it was standing on the nest edge. I looked thru the binoculars and sure enough, it was up and calling in distress, which meant someone or something had disturbed it. I looked around and noticed a very large light brown bird. It was a young juvenile eagle—I would guess a first year. It still had the black tip nose and had a lot of marbling on it's breast. Perhaps it was a chick returning to it's birthplace knowing that if chicks had been born there may be free food around. Since they are opportunistic birds, any chance of free is worth checking out. That did not happen as the distress calls worked and the adult mate flew onto the branch nest to the juvenile and as it landed the juvenile took off. There was a lot of Eagle squealing going on.

The juvenile stayed around in flight for more than I thought necessary, then flew out of sight. I always get excited to see the juveniles because about 50 percent of them do not make it during their first year of life. Life is hard for a large immature bird. Carrion is sometimes laden with lead shot, power lines, cars get in the way, and fish are hard to catch and harder to keep.

The distress calls stopped and all was quiet. After a few minutes the eagle on the edge of the nest flew to a neighbor tree and I watched as they changed places on the nest. The new guardian took a few moments to make some adjustments that looked like it was rotating an egg or two before having a nice long sit. After the new sitter was safe and sound the other mate took to the air and flew out of sight.

It was a most exciting day on the eagle nest watch. I may stop by briefly again in a few days just to see if someone is still sitting.

After that, I will wait for thirty-five days to check and see if there are any hatchlings. Food drops are the best indicator of that.

Fingers crossed for this next brood.

Photo by MN Allison Volk

# More Notes from the Field

(Commonly referred to as Field Notes)

SPRING!

MN Frank Dvorak
Writer Extraordinary

We are now in **meteorological** spring according to the National Weather Service.

Hooray!

The arctic weather was hard to endure, and this warm-up is very welcome. The birds and plants are starting to respond, and insects too (where did those flies come from so quickly?)

I have watched the buds on the maple tree in my back/side yard beginning to swell, and now the flowers are emerging on the top branches!

The green leaves of daffodils are visible in the front planter too. My neighbor's maple tree is not nearly as far along, but the bird perched on an upper branch catching the last rays of afternoon sun made a good picture.

I hope we will be working in the gardens soon.

Note to Frank from NL friends: We will, we will be working soon!

Meteorological Spring is considered to be March, April and May. The other meteorological seasons consist of three consecutive months: Meteorological winter is December, January, February. Meteorological summer is June, July, August.

Meteoritical Seasons are broken down by annual temperature trends. Meteorological Spring marks the transition between coldest (Winter) and warmest (Summer) of the year

# Bald Eagles—Fact Sheet

Submitted by MN Jerry Lindhorst

Eagles typically begin to arrive around October, and set up their temporary homes among us until March.

Human presence can stress the birds and cause them to waste precious energy that they need to survive. Don't disrupt them, stay in or near your vehicle or boat for better viewing. Use binoculars or a spotting scope to view the birds from a comfortable distance.

Trespassing on private property to observe Bald Eagles is against the law. Respect landowners and treat them with courtesy.

These magnificent creatures soar on average wing spans of 6 1/2 to 7 feet. Bald eagles prefer cold, clear mornings. They soar on windy days, and roost when it rains.

The bald eagle is protected by a number of state and federal laws, each with stiff penalties. The Eagle Protection Act, which protects bald and golden eagles, combined with the Criminal Fines Improvement Act of 1987, can cause violators to spend two years in jail or be fined up to $10,000 on a misdemeanor charge.

It is illegal to pursue, harm, harass, take or attempt to take, possess, sell, purchase or transport either eagles, eagle pans or their eggs without a permit.

If you find an Eagle feather, look at it, take a picture, but do not pick it up. If you know of anyone committing such a violation, call the state game warden in your county.

Eagles typically live between 20-30 years in the wild. As apex predators, they are relatively long-lived compared to many other birds. The oldest wild eagle on record living in the wild is about 32 years of age.

Questions

ꕥ Do bald eagles have only one mate for life? Typically, yes, although occasionally an intruding adult (not one of the pair) comes in (usually a female) and battles the resident bird for the territory, sometimes then taking over. If one of the pair dies, the other will find a new mate and usually keep going in the same territory.

ꕥ Do eagles push their young out of the nest to encourage them to fly? No! The adults may withhold food as the eaglets get near fledging, and encourage them to fly to a nearby perch to get their meal, but that's about it. Usually, no coaxing is necessary and the eaglets are all too anxious to test their wings!

ꕥ Do bald eagles build their nests in low trees? No, nor do they prefer to. Given the option, eagles will choose a "super-canopy" (one rising above the rest) tree with sturdy limbs and a commanding view of the surrounding terrain, which is also always very near to water. Typical nest heights are 50-125 feet high.

ꕥ Why do bald eagles have such big nests if they only have two eggs? They are large birds and their young become quite large, demanding of lots of space to fit all the birds and their 6 foot plus wings.

ꕥ About how long does it take for the bald eagle's eggs to hatch and how long until it can fly? It takes 35 days to hatch. The young remain in the nest for another 10-12 weeks until they fledge (fly from the nest.)

ꕥ How old are they before young eagles can fly? At 10-12 weeks, when they leave their nest.

ꕥ When do eagles learn to fly and how? At between 10-12 weeks as they first leave the nest (fledge), and then with more and more practice to and from the nest and surrounding trees over the next month or two.

ꕥ How old does a baby have to be to leave its mother? Two weeks to leave the nest, although fledglings then often stay around "learning from their parents and honing their flying and feeding skills for another 1-2 months.

ꕥ How long does it take the eaglet's feathers to turn brown? The feathers are brown as soon as they start to appear, which happens starting at 5 weeks of age; they are pretty well fully feathered by 9 weeks.

ꕥ How do eagles find their old nest? Since the nests are so large, it's probably pretty easy, especially if they haven't gone too far! These birds obviously "store" great amounts of information or "memory" of the landscapes in their lives, as they easily move 50 - 100 miles in a winter day in search of food.

ꕥ Out of twenty eaglets, how many will live to be adults? This varies with the population in question. About 2.5 adults would survive for every 20 (1 in 8). Mortality is highest for eagles in their first year of life, especially their first six months. The first winter is crucial. Some biologists (two studies) have estimated mortality as high as 72 percent within one year of fledging. Another study estimated that only 11 percent of eagles were alive after 3 years of life. In general, only about 1 in 10 eagles survive to adulthood (5 yrs. of age).

ꕥ How many eggs does an average bald eagle lay in a lifetime? The average bald eagle clutch size is just under 2 eggs/clutch (1.9). If we assume that a female eagle begins nesting at age 5, and lives until she is 25, she will have 20 years of egg-laying. There is no evidence that a healthy eagle reduces egg-laying as she gets older. So 2 eggs/year X 20 years = 40 eggs in her lifetime.

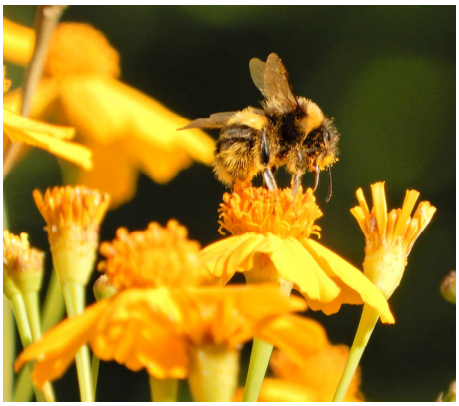
ꕥQ: Are eagles courting when they interlock talons and soar through the air? With wildlife, it is often hard to determine reasons behind behaviors we may observe. Talon-grappling and tumbling are frequently observed behaviors; seen between all combinations of eagles. Meaning, between mated adults, un-paired adults, adult and immatures, immatures with immatures, etc. These are also likely "unions" of any-sex combination of birds. That with variety of participants, there is no one answer to what this behavior is for, but rather, that it happens for a variety of reasons: Pair-bonding, aggression, and play.

ꕥ Do young eagles learn to hunt from their parents or are their skills innate? Young eagles from wild nests develop their hunting skills on their own, but spend considerable time after they fledge watching their parents and undoubtedly learning by watching what the adults do. The actual skills involved are learned by trial and error.

# From Our Members

Grasshopper at Shaw Nature Reserve
MN Jean Harmon, Sep 2020

At MN Elaine's Yard
Looks like maybe a Red Shouldered Hawk



From "Down Under"
New Zealand, Feb 2020
Photo by MN Connie Campbell's
Husband Larry Campbell

The marbled orb weaver, sometimes called "pumpkin spider", is a colorful spider who can be found all over the eastern United States. The pattern is variable on the rounded abdomen, and the color can be orange, yellow, or white. Their wheel-shaped webs are spun by the female, and can be found among trees and tall weeds in moist woods, often near streams.

MN Jean Harmon

Safe Landing!

## Say what?

Biobased Kitty Litter is the Cat's Meow

ARS (USDA) scientists have developed a biobased kitty litter made from eastern red cedar flakes, guar gum, biochar, and other biodegradable ingredients. Learn more at

Tellus | | USDA-ARS
(https://tellus.ars.usda.gov/stories/articles/biobased-kitty-litter-is-the-cat-s-meow/?utm_medium=email&utm_source=govdelivery)

# Which Milkweeds Do Monarch Butterflies Prefer?

Not all milkweeds are created equal when it comes to species of the native flowering plants that monarch butterflies prefer most.

That's the conclusion of a team of Agricultural Research Service (ARS) (USDA) and university scientists who monitored the egg-laying preferences of female monarch butterflies. Their research supports a broader national effort to reverse this iconic insect's declining numbers through milkweed habitat restoration projects.

According to Rick Hellmich, an entomologist with the ARS Corn Insects and Crop Genetics Research Unit in Ames, Iowa, milkweed plants, primarily from the genus Asclepias, are the only food source of the monarch's distinctively striped larvae (caterpillars). Natural chemicals the caterpillars ingest from milkweed also protect them and the adult butterflies they'll later become from predation.

Over the past 2 decades, however, monarch numbers east of the Rockies have fallen by 80 to 90 percent. The decline is partly attributed to shrinking milkweed habitat, especially in the Midwest. Every year, monarch butterflies make a multi-generational migration to and from overwintering sites in mountain regions of Central Mexico. They arrive at their summer breeding grounds—the Midwest—in late spring and increase their population size over two to three generations before returning to Mexico.

Restoration efforts call for reestablishing milkweed populations in these important summer breeding areas. However, there's been no systematic study of which milkweed species the butterfly prefers most—an important consideration in maximizing the effectiveness of conservation efforts, notes Hellmich.

To find out, he collaborated with researchers from Iowa State University (ISU) on a multi-year field study that evaluated the attractiveness of nine milkweed species common to Iowa, a state that's centrally located in the butterfly's midwestern breeding range.

In addition to determining which milkweed species averaged the greatest number of eggs deposited by female monarchs, the researchers calculated the survival rates of caterpillars that hatched from the eggs and pupated. Throughout, the team kept data on plant height, number of blooms, and pod size as potential indicators of attractiveness to the butterflies.

Below are highlights of the team's findings, led by ISU scientist Victoria Pocius, and reported in the journal Frontiers in Ecology and Evolution:

- Female monarchs will lay eggs on all nine milkweed species, but they prefer some over others.
- Swamp milkweed (Asclepias incarnata) and common milkweed (A. syriaca) averaged the highest number of eggs.
- Monarch caterpillars hatching from eggs laid on tall green milkweed (A. hirtella) and prairie milkweed (A. sullivantii) had the lowest survival rates.
- The height and number of blooms on the milkweed plants across all nine species weren't factors influencing the female butterflies' egg-laying preferences.
- The findings indicate that while female monarchs do make choices, they don't specialize in reproducing on a single milkweed species. What's more, their egg-laying preference can change according to the time of season, the prevalence and habitat of the milkweed species they encounter, and the plants' robustness and maturity.

For these reasons, the researchers caution against focusing restoration efforts on a single preferred species, like swamp milkweed. Instead, conservators should also consider supplementary plantings of other species—especially in habitat areas subject to variable climates or soil types.

–By Jan Suszkiw,
ARS Office of Communications.

A monarch caterpillar feeds on common milkweed, Asclepias syriaca. Milkweed plants, primarily from the genus Asclepias, are the only food source of monarch caterpillars. Photo by Peggy Greb.

# Eagles Watch Report

The Missouri Eagle Watch Program allows volunteers to contribute to science by collecting information necessary for the conservation of bald eagles.

We have 16 members volunteering for the Eagle watch program.

Alberta and Jerry have formed a team and will be watching the Eagles in a nest.

Connie Campbell and Gail Gagnon located an eagle nest at Legacy Park. They found a largish one and are going to keep an eye on it for the Eagle nest monitor program.

Photo by MN Connie Campbell

MN Allison Volk, is monitoring three sites. In one of the nests she is monitoring eggs that are being incubated. The other two are so far unoccupied. She usually walks at the Veterans Tribute Park once or twice a day. She has seen one eagle one day and two on another day with two red tails soaring in the wind currents. There is a nest not far from there, only about 1 mile. Usually in the winter you can see at least one eagle sitting in a sycamore tree behind Stone Signs at the corner of 94 and Mid-Rivers on the Pitman Hill side.

Allison was looking for a new nest at Busch wildlife but did not find one. She saw a small adult eagle and two Juveniles—first year she thinks. The juveniles were huge as their first flight feathers had not completely molted out yet. They look like really big turkey vultures until you can see the marbled breast and giant head with the fanned tail. I was at Lake 33.

MN Fran Dvorak was starting his walk at Veteran's Tribute Park about midday one day, and noticed large birds soaring above the fields. The clouds had started to clear and he could distinguish white head and tails. Eagles! There were two near him, then he noticed a third and forth on the other side of the park. They climbed higher and were harder to identify except as dark dots in the sky. They were in the vicinity for about five minutes, then were gone.

Frank says, "I don't recall seeing eagles there previously." The park is just over 2 miles north of the Missouri River, between Pitman Hill and Kisker road.

Inflorescences (flowers) of centipedegrass. The purple anthers, shown here, contain the pollen that is collected by bees. Photo credit: Dr. Shimat Joseph, University of Georgia.

## GRASS FLOWERS ARE SOMETHING TO BUZZ ABOUT

Turfgrasses sometimes get a "bad rap" for not giving our bees and other insect pollinators a helping hand on the food front. But Agricultural Research Service (ARS) and University of Georgia (UGA) studies suggest this reputation is unfair—and at least five different genera of bees would agree!

In the world, 70 percent of the main crops used for human consumption are dependent on bees and other pollinators. Yet, worldwide, pollinators have been in decline for the last several decades. Turfgrasses are often blamed for the decline and it is often stated that turfgrasses are wind-pollinated, and thus useless for pollinators.

The team's findings, published in the November issue of Insects, provided evidence to the contrary. "This is vital research as we aim to protect the natural environment of pollinators that are the foundation of our food supply," said Karen Harris-Shultz, a research geneticist at the ARS Crop Genetics and Breeding Research Laboratory in Tifton, Georgia.

"This new knowledge sets the baseline for future research to show that turfgrasses can serve as a food source for pollinators."

Centipedegrass is a popular turfgrass found mainly in the southeastern part of the United States and is known for its heat tolerance and low maintenance, making it a favorite among homeowners and landscapers but prior research had suggested that it is of little use to pollinators.

However, for many years Harris-Shultz had noticed bumblebees and honeybees collecting pollen from the flowers of centipedegrass lawns. She mentioned this to UGA entomologist Shimat Joseph and UGA physiologist David Jespersen. They decided to start research projects to identify pollinators that pass through centipedegrass lawns and differentiate them from insects that directly collect pollen from centipedegrass flowers.

To identify the types of pollinators foraging on the grass flowers, the researchers collected specimens from 11 centipedegrass lawns starting mid-August to the end of September. Using sweep nets, they homed in on insects that were foraging pollen from centipedegrass and were later identified in the lab by Joseph. Their specimens included bumble bees, honeybees, sweat bees and hoverflies.

"Our collaboration with the University of Georgia has been exceedingly fruitful," said Harris-Shultz. "We have challenged commonly held scientific beliefs and found that a turfgrass serves as a food source for five genera of bees. **We suspect other turfgrasses may serve as a food source for pollinators as well."**

Now that it is known that pollinators are transiting in centipede lawns, homeowners can play an important role in helping out the insects by adopting new lawn-management practices, such as changing how often they mow. This will allow the flowers to emerge from the grass and prevent them from producing seed as quickly. Homeowners can also reduce or change their selection of insecticides to limit the pollinators' exposure to chemicals.

Think your January is cold? Seeds at the National Center for Genetic Resources Preservation in Ft. Collins, CO are safe guarded 365 days in a –18°C (0°F) storage vault.

To learn more read A "Library" for Safeguarding Our Food Supply:

https://tellus.ars.usda.gov/stories/articles/a-library-for-safeguarding-our-food-supply/

♦To all who have graciously contributed to this newsletter—You are wonderful!

♦A big thank you goes to Deborah Moulton for finding such a wonderful, diverse group of interesting webinars that will count for Advanced training. It was so cool to have so many that could be completed even before Winter was over.

♦Thanks to Alison Robbins for sending out the great tutorial on navigating the new Confluence Chapter website and the "how to" for logging in volunteer and AT hours. Couldn't have done it without this step-by-step "instruction manual".

♦Thanks to Stephen Baldwin for taking the lead on building and installing, and forming a team to monitor, the bluebird houses at Towne Park. That will be a great addition to that project and something new for the children to enjoy.

# Thank You!

♦Jeanice and Jerry Kaiser for their long time work with school kids, teaching nature education, bluebirds and native plants

♦Ann Finklang who since 2006 has volunteered with our chapter, working the Quail Ridge garden, installing the Lake St Louis Butterfly Garden, the O'Fallon Public Works Project and initiating our newsletter

♦Carmen Santos who has been super committed to our chapter since 2008, working the Quail Ridge Garden and writing and designing our newsletter since 2012.

♦Jerry Lindhorst, former president for his chapter leadership and newsletter writing skills.

♦Very special thanks to Tom Holt and Tom Nagle for all the time they put in and the work they did in putting together proposals for expanding training opportunities for new Master Naturalists. This was a huge job involving finding funding sources, coordinating with other MMN chapters and the Missouri Department of Conservation. The need for this training is great, both for our chapters and the people who are waiting to become naturalists, if we are to continue to maintain our ever-growing list of worthy projects, and continue to fulfil the mission of our program. Great work, guys!

♦Connie Campbell for her childlike sense of humor, her Bluebird skills, her "out of this world" choice of husbands, and commitment to the Confluence Chapter since 2010.

♦And thank the heavens for getting us through the recent super cold snap and the snowy winter weather. We can now be grateful for more moderate temperatures and enjoy all the new signs of Spring.

## Our Leadership

- President—Alison Robbins
- Vice President—Stephen Baldwin
- Secretary—Steve McCarthy
- Treasurer—Jean Crinean
- Advanced Training—Deborah Moulton
- Volunteer Coordinator—Alberta McGilligan
- Membership Services— Tom Holt
- Web Site—Rick Gray and Rob Merriman
- Photography—Dave Lemoine
- Newsletter—Carmen Santos, Peg Meyer, Leslie Limberg and Elaine Browning

**Advisors**

- MDC, Colleen Scott, Colleen.Scott@mdc.mo.gov
- UMO Extension, Justin Keay, justin.keay@Missouri.edu

**Project Leaders**:

- Confluence Chapter Stream Team #3612—Cliff Parmer
- Babler State Park—Alberta McGilligan and Bob Coffing
- 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
- Wild Bird Rehabilitation Sue Stevens
- Daniel Boone Hays—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
- Native Flower Potting & Distribution Alberta McGilligan

- Past Presidents
  Scott Barnes,
  Connie McCormack
  Jerry Lindhorst
  Leslie Limberg
  Cliff Parmer
  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/