



Your key to discovering the *Natural Missouri*

August 2018, Volume 12, Issue 03

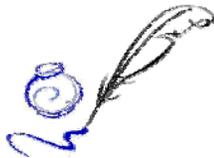


From
Our President

Midsummer is a time for taking it a little easy. The heat seems to slow us down and we are forced to walk a little slower and sit a little more.

Prairies are at their best. Milkweed has bloomed and is busy preparing pods for seeds. I have lots of milkweed of each kind but, unfortunately, no Monarchs have stopped by or if they have, they left me no eggs. Who said if you build it they will come? I tell Bob Lee I just have a milkweed seed farm. Oh well, that works for the butterfly benefit too.

I hope you have had lots of insect visitors and may-



be some baby butterflies.

Our projects are looking good. Even though it has been so hot all the plants we planted this spring seem to be doing well.

We have some new activities to look forward to this fall. The BIG EVENT will be the Monarch Madness on September 15 at the Weldon Springs Interpretive Center. If at all possible, please plan to volunteer at this important event.

Also, please spend some of your time thinking about whether you could take on leadership roles with the chapter. We need committee chairs, officers, and project leads. You might be just the person who makes a difference for our chapter and nature.

Alberta

Alberta McGilligan
President, Confluence Chapter



NEWS FLASH: I have Monarchs visiting today. Maybe they will leave me some gifts

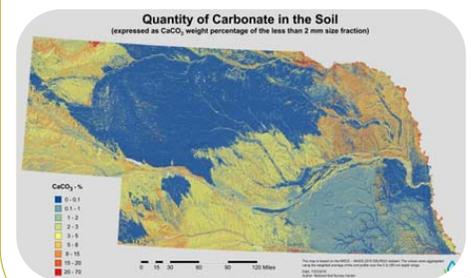


Missouri
Master Naturalist
2018 Certification Pin
Mead's Milkweed
Aclepias meadii

Come and see it at Quail Ridge!

The National Soil Survey Center is now featuring a display called "Map of the Month" to generate awareness about historic soil survey maps. July's map is one of the first soil maps of Alaska. For more information and to download the map, please visit <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=NRCSEPRD1406833>.

August's map of the month shows calcium carbonate in the soils of Nebraska. Calcium carbonate stores carbon dioxide from the atmosphere. Excess carbon dioxide is a major driver for climate change. Removing excess atmospheric carbon and storing it as calcium carbonate in soils is an active area of research. View the map at https://www.nrcs.usda.gov/wps/PA_NRCSCconsumption/download?cid=nrcseprd1411222.pdf



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To engage Missourians in the stewardship of our state's natural resources through science-based education
and volunteer community service.

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Milestones, Certifications, Annual Pins, and Other Recognitions



July

—The Mead's Milkweed, *Aclepias meadii*, pin was awarded to Master Naturalists Leslie Limberg, Glenn Bish, Donna Bourisaw, Elaine Browning, Connie Campbell, Bob Coffing, Paul Crombie, Gail Gagnon, Jean Harmon, Martha Hessler, Lee Holloway, David Lemoine, Linda Leong, Larry Markley, Pat McCoy, Alberta McGilligan, Thomas Nagle, Nancy Newcomer, Sandy Oldfield, Cliff Parmer, Jane Porter, Alison Robbins, Carmen Santos, Bob Siemer, and Allison Volk.



—Annual pins were awarded to: Rob Merriman, Kathy Murray, Phil Rahn, Sue Stevens, and Tara Wallace.

From left to right: Kathy Murray, Jim Biehle, (membership award), Phil Rahn, Rob Merriman, and Tara Wallace



Lifetime Awards:

-  The Bronze Dragonfly pin for 250 hours, was awarded to Kathy Murray, Alison Robbins, and Paul Crombie
-  The Pewter Dragonfly for 500 hours, was awarded to Pat Burrell-Standley, Nancy Newcomer, and Lee Holloway.
-  The Gold Dragonfly for 1,000 hours, was awarded to Connie Campbell.

August

Jim Biehle received his Master Naturalist certification and nametag.



Nancy Newcomer was awarded the pewter dragonfly for 500 hours.



Vermicomposting—Master Naturalist Karen Foster presented a very informative and interesting class on Vermicomposting.

Naturally caused **forest fires** are usually started by dry lightning where little to no rain accompanies a stormy weather disturbance. Lightning randomly strikes the earth an average of 100 times each second or 3 billion times every year and has caused some of the most notable wildland fire disasters in the western United States.



Most of these human-caused fires are accidental usually caused by carelessness or inattention by campers, hikers, or others traveling through wildland or by debris and garbage burners. Some are intentionally set by arsonists.

Most lightning strikes occur in the North American southeast and southwest. Because they often occur in isolated locations with limited access, lightning fires burn more acres than human-caused starts.

The average 10-year total of U.S. wildfire acres burned and **caused by humans** is 1.9 million acres where 2.1 million acres burned are lightning-caused.

Still, **human** fire activity is the **primary cause** of wildfires with nearly ten times the start

Some human-caused fires are started to reduce heavy fuel buildup and used as a forest management tool. This is called a **controlled or prescribed burn** and used for wildfire fire fuel reduction, wildlife habitat enhancement, and debris clearing. They are not included in the above statistics and ultimately reduce wildfire numbers by reducing conditions that contribute to wildfire and forest fires.

https://www.thoughtco.com/the-causal-history-of-forest-fires-1342893?utm_campaign=wilat&utm_medium=email&utm_source= Used by permission



Raccoons use their nimble paws in surprising ways. Highly intelligent, they have adapted to live in forests, mountain areas, coastal marshes and even urban centers.

In Native American legends, raccoons are often known as tricksters and mischief-makers. Raccoons are common throughout North America, and this mother and her kits were spotted at Loxahatchee National Wildlife Refuge in Florida.

Photo courtesy of Alan Crutcher, Friends of Arthur R. Marshall Loxahatchee National Wildlife Refuge.





Meet Your Fellow
Master Naturalists

Tom Nagle

By Master Naturalist and
Writer Extraordinaire Lee Phillion



One of Tom Nagle’s first achievements after retiring was becoming a **Master Gardener**. That was in 2010. He followed that up in 2011 by also becoming a **Master Naturalist**. Tom has wound those two interest strands together for the last seven years to benefit the natural world.

Everybody knows Tom Nagle—the larger-than-life former vice president of the Confluence Chapter; the **Forest ReLeaf** cheerleader (and operations board member); the fellow who initiated and made the **Main Street native garden** a reality, and the guy who knows just about everybody connected to nature organizations in St. Charles County. That includes the river community, too, as he is a supporter of Missouri River Relief.

Betcha didn’t know Tom spent twelve years as a volunteer **Rescue and Recovery Diver** (yes...SCUBA) with the sheriff’s department. “Unfortunately, we

didn’t do a lot of rescue... mostly recovery,” said Tom. That was during the time Tom was managing a real estate office in St. Charles County and then running a flooring company.

In college — at Central Methodist University — Tom played football (tight end, wide receiver and defensive end), and married the captain of the cheerleader squad. Today, Tom and his wife Linda have three grown children who have been captain of the football team (son), dance line captain (daughter) and girl’s basketball captain (daughter). It’s an athletic family. Tom and Linda also have five grandchildren.

A lifelong outdoor enthusiast, Tom combines a heap of self-education with ongoing formal education. Classes in horticulture and landscape design at Washington University came in handy recently when Tom spearheaded the creation of a new native garden on Main Street in St. Charles. “That happened because the property owner had a spot he wanted to do something with, and he talked with the county’s forester, Danny Moncheski,” said Tom. “Moncheski suggested the owner speak with me.” (Tom also serves on the county’s forestry council.)

Long story short, Tom was able to score enough donated plants and seeds, greenhouse space (at Forest ReLeaf), potting medium and volunteers to come up with around 1,700 plants for both the Main Street Garden and the Confluence Chapter plantings at Brommelseik Park. He and chapter member Martha Hessler designed the Main Street garden, which was prepped and planted by Confluence volunteers.

Tom’s volunteering (which averages around 700 hours per year) covers a wide range of activities, including Eagle Days, Forest ReLeaf, chapter duties and other board memberships. It’s wide-ranging, befitting

his interests. His latest project for Confluence is a **new hoop house** to be constructed at Quail Ridge Park nursery. Tom secured money for the hoop house and a few years of maintenance from the St. Charles Garden Club. “The hoop house will help **Missourians for Monarchs** and other chapter projects finish off plants that we can grow from collected seeds—when we get the greenhouse,” said Tom, with that look in his eye that said he has a plan to make that a reality.

SUCCESS STORY

(*Gaura neomexicana*
ssp. *coloradensis*)

Colorado butterfly plant.

Photo Credit: Allison Michael.



Thanks in large part to successful partnerships with landowners that have helped recover the species, the U.S. Fish and Wildlife Service announced plans to remove the Colorado butterfly plant from the Federal List of Endangered and Threatened Plants and to remove designated critical habitat. The species is a member of the evening primrose family and is found primarily in south-eastern Wyoming, north-central Colorado, and western Nebraska





Master Naturalists in Action

Stream Team

23 June 2018
On the Job!



Master Naturalists Rob Merri- man, Deborah Weaver, Tom Holt, Cliff Parmer, and Elaine Browning



From left to right is Tom Holt, Deborah Weaver, and Raymond West. Raymond is a senior at South-east Missouri State University major- ing in environmen- tal sciences



O'FALLON PROJECT

We are determined to grow native plants amidst all this industri- al equipment—here are some. Photos by MN Elaine Browning.



In this area we are growing Purple Cone Flowers, Asters, Bear Tongue, Coreopsis, and Prairie Blazing Star.

And ...



So far we have counted TEN Monarch caterpil- lars and three Monarchs.

Main Street, St. Charles

Hard-working, intrepid volunteers have created a won- derful (and very visible) St. Charles garden—an incredi- ble pollinator habitat!



Broemelsick Pollinator's Project





Big Hats & Even Bigger Jobs: Celebrating World Ranger Day 30 July 2018

Ranger is a broad term for the people who work on public lands around the world. Their responsibilities include protecting wildlife, landscapes and the people who visit them. Rangers can fill the role of law enforcement officers, scientists, firefighters, history teachers and much more. Depending on where they serve, rangers are often faced with difficult and dangerous tasks.

"Though small in number, their influence is large. Many and long are the duties heaped upon their shoulders. If a trail is to be blazed, it is "send a ranger." If an animal is floundering in the snow, a ranger is sent to pull him out; if a bear is in the hotel, if a fire threatens a forest, if someone is to be saved, it is "send a ranger." If a Dude wants to know the why of Nature's ways, if a Sagebrusher is puzzled about a road, his first thought is, "ask a ranger." Everything the ranger knows, he will tell you, except about himself." Stephen T. Mather, First Director of the National Park Service

Harry Yount—Blazing a trail for park rangers. After serving in the Union Army during the Civil War, **Harry Yount** worked as a hunter,



trapper and guide in several western territories. Hired by expeditions from the Department of the Interior and the Smithsonian Institution, Yount became an expert on the newly established **Yellowstone National Park**. When funding allowed, he was hired as the park's first "gamekeeper." Independent, resourceful and familiar with the natural processes surrounding him, Yount became a model for the national park ranger. Realizing the job of protecting the park's wildlife and assisting visitors was more than a one-man job, Yount proposed the creation of a ranger force, cementing his place as the **"father of the ranger service."** Harry Yount. Photo from National Park Service Archives.

Clare Marie Hodges, the first woman national park ranger, gained a love for the outdoors dur-



ing a four-day horseback ride to Yosemite Valley in 1904 when she was 14 years old. While teaching in the Yosemite Valley School, she heard about the difficulty the park was having finding men to work as rangers due to World War I. In the spring of 1918, she got a job taking the gate receipts from Tuolumne Meadows to park headquarters, an overnight ride on horseback. Combining the traditional ranger hat with a woman's split riding skirt,

she sometimes confused people who couldn't understand why a woman was wearing a ranger's badge. Though she only served one summer as a ranger, Hodges remained in the **Yosemite** area the rest of her life, ranching and working as a nature guide.

Clare Marie Hodges sits on horseback in split riding skirt. Photo by National Park Service.

At 96 years old, **Betty Reid Soskin** is the oldest active ranger in the National Park Service. In 2000,



Soskin was working for the California State Assembly and joined the commission charged with creating **Rosie the Riveter WWII Home Front National Historical Park**. Sharing her experiences working for a segregated labor union during the war, Soskin added a unique perspective to how the new park would tell the story of the home-front. While white women took jobs as riveters, Soskin was denied the opportunity because of the color of her skin. Building on that powerful connection, she joined the staff at the park and continues to inspire thousands of people a year with her presentations. Betty Reid Soskin. Photo by National Park Service.

Buffalo Soldiers—Breaking new ground protecting public lands. **Buffalo Soldiers** were among the first people patrolling new national parks in the American West.

Continues on Page 6





Rangers (continued) ...



African-American army regiments—formed just after the Civil War—fought in the Indian Wars and were given the name Buffalo Soldiers by Plains Indians who saw a resemblance between their dark, curly hair and the matted cushion between the horns of the buffalo.

Over 500 Buffalo Soldiers served in **Yosemite National Park** and **Sequoia National Park** as some

of America's first park rangers. With duties ranging from evicting poachers and timber thieves to extinguishing forest fires, the Buffalo Soldiers carried out many roles similar to modern-day park rangers. The presence of these soldiers as official stewards of park lands brought a sense of law and order to the mountain wilderness and their accomplishments are an integral part of park ranger history.

A living history demonstration of Buffalo Soldiers at Fort Larned National Historic Site. Photo by National Park Service.



International Rangers --



A global mission to protect—Since 1989, the **U.S. Fish and Wildlife Service** has provided support to more than 700 partners in Africa, with projects that target key threats to wildlife and their habitats, strengthen capacity and forge partnerships, and build a better research base for conservation.

Virunga rangers with sniffer dogs. Photo courtesy of Virunga National Park.

The Incredible Value of Insect-Eating Birds



by Brandon Keim

A great many birds eat a great many bugs; this is something that, in general, we already know. But just how much do they eat? Empirical figures are hard to come by—but according to a new estimate, published in the journal *The Science of Nature*, the total figure is truly breathtaking, roughly equivalent to the weight of meat and fish consumed each year by humans.

Calculated by researchers led by biologist Martin Nyffeler of Switzerland's University of Basel, the estimate draws upon earlier studies describing what each bird

species eats, how much energy they require, and how many of them there are. Nyffeler's team concludes that the total biomass of wild bird-consumed insects amounts to some 400 million tons. On average, individual birds consume more than 100 times their own body weight in bugs.

The researchers also point out another nuance to their study: in addition to describing the importance of birds for regulating insects, the findings also demonstrate how important insects are for birds. Many recent studies have described a precipitous decline in global insect populations—a trend that Nyffeler calls "frightening." "We need to find out all about the extent and cause of this phenomenon," he says.

Source: Nyffeler et al. "Insectivorous birds consume an estimated 400–500 million tons of prey annually." *The Science of Nature*, 2018. Image: YouTube <http://www.anthropocenemagazine.org/2018/08/the-incredible-value-of-insect-eating-birds/> Used by permission



EPA's most recent report highlights that, between 1970 and 2017, the combined emissions of six key pollutants dropped by 73 percent, while the U.S. economy grew more than three times. A closer look at more recent progress shows that between 1990 and 2017, average concentrations of harmful air pollutants decreased significantly across our nation:

- Sulfur dioxide (1-hour)↓88 percent
- Lead (3-month average)↓80 percent
- Carbon monoxide (8-hour)↓77 percent
- Nitrogen dioxide (annual)↓56 percent
- Fine Particulate Matter (24-hour)↓40 percent
- Coarse Particulate Matter (24-hour)↓34 percent and
- Ground-level ozone (8-hour)↓22 percent

Even with this success, some Americans still live in areas that do not fully meet national standards and EPA continues to work with states, local governments, tribes, and citizens—to further improve air quality across the entire country.

The report includes interactive graphics that enable citizens, policymakers, and stakeholders to view and download detailed information by pollutant, geographic location, and year.

Explore the report and download graphics and data:

<https://gispub.epa.gov/air/trendsreport/2018/>





From Switzerland with Love

I am all settled into my apartment here in Zug, Switzerland. After my first month here, I am finding everything new and exciting. I think this is my first time noticing the photo I have attached. It is in the Apiaceae family and is known here as *Astrantia* Star of Billions. I found it while hiking down Alpine woods between Müren and Gimmelwald. It likes part sun and moist hillsides. It grows in clusters of up to 16 inches and is now sold at garden stores. The blooms last most of the summer and are used for cut flowers and dried flower arrangements. I saw a few insects and bees on the blossoms.



While I will continue my hunt for true Edelweiss, I am enjoying all the lovely gardens that people have here. I guess because many live in shared spaces like apartment buildings, some people own a plot of



Mountain house with garden Müren

land with a tiny little cabin all clustered together. Like a gardening community. They go out several times a week and tend their beautiful plots of trees, flowers and vegetables. Maybe because of the shared living, there are a lot of terraces and building roofs that are used as growing habitats. You will see a little mini woodlands on a passing terrace or building where folks work. Even with the personal gardening efforts, we have noticed a lack of insect life and lack of song birds.

There is a big push to help the bee population here as many spaces will have a bee habit box or

hanging tree cookies with drilled holes in them.

I have a lot more to learn and will share any new observations again next newsletter. If anyone is on Instagram, I post a lot of pictures there of what we are doing and what I am photographing. My account is a4volk. I will send a few more photos that you can share if desired.

Take care and I wish everyone well.

Allison

Few bee types—including a white bottom bee—on a carrot family member. I do not think I have seen a white bottom bee in the US.



Bombus occidentalis The Western Bumblebee Or White Bottom Bee

One of around 30 bumblebee species present in the western United States and western Canada.

Western bumblebees, a native species, were once among the most common bumblebees in the Western United States. In the late 1990s, its populations crashed, and the species all but disappeared from about a quarter of its historic range.

They have been found from the Mediterranean to California all the way up to the Tundra regions of Alaska, making them one of the bees with the widest geographic range. However, recently there has been a noticeable decline in population. In the past decade, the population of *B. occidentalis* has dropped by around 40 percent (%). The disappearance of these bees has been especially signifi-

cant in California, western Oregon, and western Washington. The range and persistence of *B. occidentalis* has also gone down by around 20 percent (%).

Some scientists point to the rise of *Nosema*, a parasite, as the reason for the decline in population. Others say that the population decline could have come because of the invasion of European honey bees. **A study in 2016 suggested that the Western bumblebee population is rebounding**, possibly due to evolutionary development of resistance to *Nosema*.



Photo credit: Stephen Ausmus, USDA ARS; Public Domain

Nosema apis is a microsporidian, a small, unicellular parasite recently reclassified as a fungus that mainly affects honey bees. It causes **nosemosis**, also called **nosema**, which is the most common and widespread of adult honey bee diseases



Sweat bees are excellent pollinators of many of the smaller flower type of native plants which are often bypassed by the larger bees. Sweat bees (*Halictus*) are ground nesting bees that generally use vertical tunnels with side passages leading to egg chambers to rear their young

They are commonly referred to as "sweat bees" (especially the smaller species), as they are often attracted to perspiration. They are likely to sting only if disturbed; the sting is minor.





FROM THE WILD AND NATURAL SIDE



Bobcats thrive at Gila Cliff Dwellings National Monument in New Mexico but are rarely seen. Mostly nocturnal, they use stealth

and excellent night vision to hunt small mammals in darkness. Bobcats are usually tawny with darker spots and streaks on their body and legs, and light-colored undersides. They have short black tufts on their ears and a ruff of longer fur on their face. The kittens may look like ordinary house cats, but they quickly grow to twice the size of domestic cats. Photo by National Park Service



If patience was a plant, it would be a **Bristlecone pine**. Cautiously growing in the harsh terrain of Great Basin National Park in Nevada, these amaz-



ing trees can grow to be more than 5,000 years old. Gnarled, twisted and scattered in groves on rocky ground, Bristlecone pines make excellent subjects for photos.

Photo by Thomas Sikora
www.sharetheexperience.org.



Hoodoos are weathered rock formations carved by the forces of nature into fascinating shapes. Bryce Canyon National Park pre-



serves the world's largest display of hoodoos in a remarkable natural amphitheater. As sunlight and shadows move across the stunning landscape, the park takes on different moods. This towering hoodoo is called **Thor's Hammer**. Photo by James Fishman (www.sharetheexperience.org).



Not giant mosquitoes, **Crane flies** may look like huge mosquitoes, but they don't bite or carry diseases. Most adults don't even have a mouth!



They live off the extra fat they build when young. Photo: Crane fly courtesy of Dan Mullen/Creative Commons. <https://flic.kr/p/bWii1T>



Photo: Clearwing hummingbird moth sipping nectar from wild bergamot by Mike Budd/USFWS. See them at **Quail Ridge** moving around different flowers



The **painted turtle** is the only North American turtle that naturally occurs across the whole continent. Now is the time to start watching for tiny painted turtles! While some will leave the nest shortly after breaking from their eggs, others will overwinter in the nest if the location is suitable. Courtney Celly/USFWS.



Rattlesnake Master is a native plant that grows 3-5 feet tall and does well in dry soil. It attracts a variety of butterflies, wasps, bees, and beetles. You can see a magnificent example at our **Quail Ridge** Prairie Demo Garden.



What a colorful wetland scene! Cumberland Island National Seashore is on the largest and southernmost barrier island in Georgia. Here pristine maritime forests, undeveloped beaches and wide marshes whisper the stories of both people and nature. Native Americans, missionaries, enslaved African Americans, and wealthy industrialists all walked here. Photo by Tone Watson (www.sharetheexperience.org)



The Opossum is truly an awesome creature. Possums have existed for millions of years and they aren't picky about what they eat. Opossums not only eat a lot of dead things, but they really love to eat ticks. With tick populations and tick-borne diseases on the rise, some people are turning to unconventional methods of prevention. In one Pennsylvania town, they're trying Opossums. The Pocono Wildlife Rehabilitation and Education Center in Stroudsburg says that many people have requested opossums to release into their yards. One Opossum can eat up to 5,000 ticks a year. They are meticulously clean and since there aren't any diseases that people can get from Opossums, there really is no downside. And, they are immune to rattlesnake bites.



Experts, however, warn that Opossums can still be dangerous to humans. Although generally gentle and placid, they have 50 teeth and will use them to protect themselves, or their young. So avoid close encounters.






Monarch Madness
A Pollinator Festival
FAMILY FUN
FREE PUBLIC EVENT!
Saturday, September 15

Time: **10 a.m. to 3 p.m.**
Location: **Weldon Spring Site**
7295 Highway 94 South,
St. Charles, MO 63304

Phone: (636) 300-2601
Email: WSInterpretiveCenter@im.doe.gov

Weldon Spring State Park
St. Charles County Parks
Missouri Master Naturalist
Missouri Master Gardener
Great Rivers Greenway
U.S. DEPARTMENT OF ENERGY Legacy Management

LIVING TREES

Only 1 percent of a dormant mature tree is biologically living while the rest is composed of non-living, structural wood cells. In other words, very little of a tree's woody volume is composed of "living, "metabolizing" tissue; rather, the major living and growing portions of a tree are leaves, buds, roots, and a thin film or skin of cells just under the bark called the cambium.

There are other living cells that are important for tree growth within the different parts of trees, especially in root tips, the apical meristem, and leaf and flower buds; however, these living cells make up a very small percentage of the total volume of a tree's cells. Instead, non-living or "dead" cells comprise most of the volume of a tree, providing vital structural support for the living cells.

Interestingly enough, trees start out in life as a germinating seed with every living cell in hyperdrive, but as a tree seed becomes a seedling, then a sapling, then a mature tree, its living contents become

less and less as a percentage of the total volume. Trees increasingly lose their living cytoplasmic cells as metabolism ceases in each cell, and although they are no longer alive, these non-living cells now provide protection, transportation, and physical support for the living ones.

Nix, Steve. "How Much of a Tree Is Alive?" ThoughtCo, Jun. 14, 2018, thoughtco.com/how-much-of-tree-is-alive-3967213. Used by permission



This year is the 50th anniversary of the **Wild and Scenic Rivers Act**, a historic landmark in river conservation. Thanks to the 1968 law, 12,734 miles of some of the nation's most impressive rivers have been protected in their free-flowing state.

You're invited to join outdoor and river enthusiasts in a national celebration of rivers. Whether you're floating down a lazy river, fishing in a clear eddy or charging through churning whitewater, river trips are fun and fascinating. Come explore deep gorges, serene stretches of meandering channels and exhilarating rapids by planning an adventure on a wild and scenic river.

Learn more about planning your next river trip. <https://www.doi.gov/blog/paddle-wild-and-scenic-rivers-wild-and-scenic-summer>

NORTHERN LEOPARD FROG

The U.S. Fish and Wildlife Service reports that scientists have developed and validated a non-lethal way to detect parasitic fungi and a virus, which can cause disease in frogs, toads, salamanders and newts. The method uses a single skin swab to test for the presence of three pathogens, so animals are happily hopping or wriggling away just minutes later.

Unlike previous methods, the test subjects amphibians to minimal stress and therefore can be used on sensitive or threatened species.

Photo by Courtney Celley USFWS.

https://www.fws.gov/midwest/news/FrogTest.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+FwsMidwestNewsroom+%28Midwest+News%29





HOW DO BIRDS KEEP COOL IN THE SUMMER?

Do you ever wonder how birds stay cool on hot summer days? The U.S. Fish and Wildlife Service want to share some insights!



An American robin splashes in a bird bath. Photo by Courtney Celley/USFWS.

Like people, birds can withstand changes in the weather and maintain their body temperature whether it's hot or cold outside, but there are limits. When summer temperatures are on the rise, birds depend on adaptations to keep from overheating. Many adaptations are different variations of thermoregulation, the mechanism that warm-blooded animals use to balance their body temperature with their surroundings. Thermoregulation is a process where warmer blood cools and then circulates throughout the body, lowering the animal's overall body temperature. It can take many forms and is a window into understanding how our physical world works. To understand how birds have adapted these cooling techniques, we need a quick overview of how thermal energy—or heat—moves from one thing to another. Simply put, heat moves in one direction, from hot toward cold. The movement of heat happens on a molecular level in all matter, whether it's solid, liquid or gas. It's within this principle that birds are able to transfer their body temperature to cooler air and water around them.

Dogs aren't the only ones panting



Common nighthawk keeping cool. Photo courtesy of Victor Fazio/Creative Commons

While birds can't truly pant like dogs, they do have their own kind of panting and some birds take it a step further and do something called fluttering. Gular fluttering, as it's more formally known, is a behavior common to nocturnal insectivores including common nighthawks and whip-poor-wills. Fluttering is a combination of rapid, open-mouth breathing and quick vibration of the moist throat membranes that causes evaporation. As excess heat leaves the bird's body with each exhalation, the bird cools. You might also see this behavior from double-crested cormorants, owls and mourning doves as they rest during the hottest times of the day.

Taking a dip in the water



Great blue heron drying after a bath. Photo courtesy of Mark Moschell/Creative Commons

Who doesn't like taking a dip in a lake or river on a hot day? Birds keep cool by taking a bath or going swimming just like we do.

Submerging exposed skin helps birds to dissipate their body heat to the cooler water around them. Some birds fluff up their feathers after a bath and open up their wings to catch a breeze, helping them cool off even more.

Want to help birds keep cool through the summer?

Provide a shallow bird bath with one to two inches of water. Birds will use baths as a cooling oasis to splash and drink. Keep an eye on water levels and clean out your bird bath daily.

As we all know, one of the best strategies for keeping cool is to avoid the heat all together. Many birds avoid the sun by limiting daytime activity. These birds will forage in the early morning, evening or throughout the night so they can conserve energy and rest during the warmest times of day.

Shade from shrubs and trees offer a place to escape from the sun's rays, so if you're planning to prune, trim or remove limbs or brush piles, wait until temperatures cool off!

Avocados



We love them, so do pollinators. Maybe a little too much! Our skyrocketing demand is having

an impact on a pollinator, the **monarch butterfly**. Did you know that 80 percent of the avocados we consume come from Michoacán, Mexico? This also happens to be the **winter home for eastern monarchs**. Farmers are clearing the monarchs roosting trees to pave way for avocados. **What avocados can you choose to protect monarchs? Buy avocados grown in the United States or Mexican fair trade.**

Photo Scott & Emily/Creative Commons.





From Our Members...

Can you see Tara Wallace's **softshell turtle** (swimming in Tara's pond)? (Photo by Tara)



Prairie Dock



Rattle Snake Master



Ohio Buckeye on Purple Cone Flowers



Swallow Tail on Purple Cone Flowers



Quail Ridge Prairie Demo Garden
(aka The Lookout Point)

photos by Ann Finklang and Elaine Browning

Softshells eat a variety of aquatic animals including fish, crayfish, salamanders, tadpoles, frogs, snails, and aquatic insects. In the wild this species is no threat to game fish populations.

Due to river channelization, siltation, pollution, and loss of sandbars, this species is likely declining in Missouri. To maintain healthy populations of this interesting reptile, **harvest is controlled by state regulations**. Consult the most recent Wildlife Code of Missouri for current regulations.

Although softshells may prey upon nearly any species of fish, there is no evidence to show that they harm a fish population in natural waters. Like other components of our native aquatic ecosystems, they contribute to the balance of nature.





Thank You!



- ♥ **David Lemoine** whose chapter photos on Flickr are awesome.
- ♥ **Frank Dvorak** for his dedication to our projects in O'Fallon and Quail Ridge. Frank just finished his new Master Naturalist training at Hannibal but will continue to help with our projects.
- ♥ **Karin Foster** for her stewardship of worms.
- ♥ **Martha Hessler** for her master gardener skills at the new Main St. garden.
- ♥ **Larry Markley** will soon terminate his membership w/ Confluence. He lives in Hannibal & will become a Hannibal chapter member. He has been a dedicated volunteer, going beyond the call of duty to be part of our chapter. Let's thank him for driving hundreds of miles over the years to volunteer for Wetlands for Kids, Maple Syrup Days, Schulze Prairie, Control Burns, our monthly meetings, and many other projects. He will continue with those volunteer days with us and probably bring in more Hannibal volunteers with him.
- ♥ **All the MNs** who took time to visit the Quail Ridge Prairie Demo Garden after the annual picnic. Our Quail Ridge Team was delighted to see you. Please come back!



Our Leadership

- President—Alberta McGilligan
- Vice President—Rob Merriman
- Secretary—Jane Porter
- Treasurer—Alison Robbins
- Advanced Training—Deborah Moulton
- Volunteer Coordinator—Ken Benson and Mark Williams
- Membership Services—Martha Hessler
- Communications—Leslie Limberg
- Web Site—Rick Gray
- Photography—Dave Lemoine
- Newsletter—Carmen Santos
- Leslie Limberg and Elaine Browning

Advisors

- MDC, Colleen Scott,
Colleen.Scott@mdc.mo.gov

Project Leaders:

- Daniel Boone Hays—Bob Coffing
- Matson Hill Park—Bob Coffing
- Cuivre River and Don Robinson State Park—Bob Coffing
- Confluence Chapter Stream Team #3612—Cliff Parmer
- Babler State Park—Alberta McGilligan and Bob Coffing
- Lewis & Clark Boathouse and Nature Center—Leslie Limberg
- 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
- Missourians for Monarchs—Bob Lee
- Birding Club—Gail Gagnon
- Schulze Woodland Restoration—Ken Benson
- Capstone Broemmelsiek Park Prairie Seeding—Phil Rahn
- Main Street Garden—Martha Hessler and Tom Nagle
- Wild Bird Rehabilitation—Sue Stevens
- Past Presidents—Connie McCormack, Jerry Lindhorst, Leslie Limberg, Cliff Parmer



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/>