MISSOURI CONSERVATIONIST

VOLUME 87, ISSUE 4, APRIL 2026
SERVING NATURE & YOU

JOIN THE 2ND ANNUAL MISSOURI BIRDING CHALLENGE

Birders of all skill levels are invited to register for the Missouri Birding Challenge!

Registration cost
$15 per participant
$10 per youth team
T-shirts sold separately

Challenge runs May 1–22. Register online between April 1-30 to secure your spot.

To prepare for this year's challenge, check out these informational videos at the link or QR code below:

- Birdwatching: Introduction and Benefits
- Birding for (and with) Kids
- Missouri Birds and Habitats

2026

SEE RULES AND PRIZES AT
MDC.MO.GOV/MOBIRDINGCHALLENGE

MISSOURI
CONSERVATIONIST

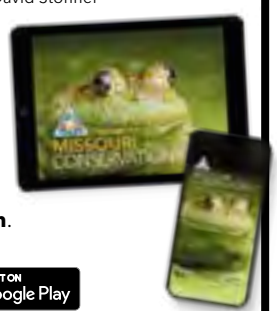
ON THE COVER

A young eastern collared lizard at Peck Ranch near Winona.

NOPPADOL PAOTHONG

EF500mm f/4L IS USM lens, f/10, 1/400 sec, ISO 200

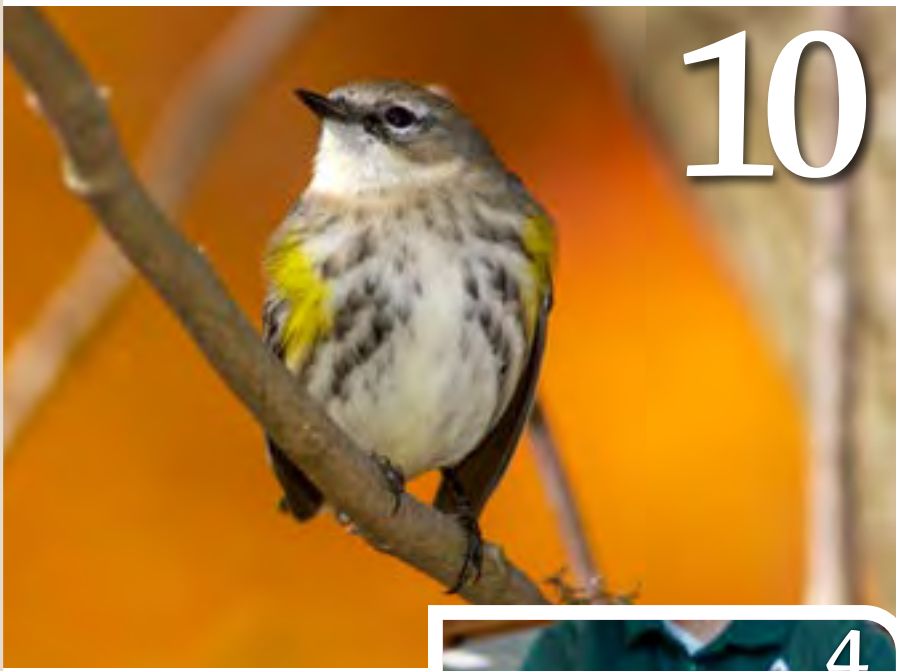
Download this issue to your phone or tablet at **mdc.mo.gov/mocon**.



Download on the App Store | GET IT ON Google Play

Contents

APRIL 2026
VOLUME 87, ISSUE 4



10

4

FEATURES

DEPARTMENTS

The *Missouri Conservationist* (ISSN 0026-6515) is the official monthly publication of the Missouri Department of Conservation, 2901 West Truman Boulevard, Jefferson City, MO (Mailing address: PO Box 180, Jefferson City, MO 65102.) Equal opportunity to participate in and benefit from programs of the Missouri Department of Conservation is available to all individuals without regard to their race, color, religion, national origin, sex, ancestry, age, sexual orientation, veteran status, or disability. Questions should be directed to the Department of Conservation, PO Box 180, Jefferson City, MO 65102, 573-751-4115 (voice) or 800-735-2966 (TTY), or to Chief, Public Civil Rights, Office of Civil Rights, U.S. Department of the Interior, 1849 C Street, NW, Washington, D.C. 20240.

SUBSCRIPTIONS: Visit mdc.mo.gov/conmag, email subscriptions@mdc.mo.gov, or call 573-522-4115, ext. 3856. Free to adult Missouri residents (one per household); out of state $13 per year; out of country $19 per year. Notification of address change must include both old and new address (send mailing label) with 60-day notice. Preferred periodical postage paid at Jefferson City, Missouri, and at additional entry offices.

POSTMASTER: Send correspondence to Circulation, PO Box 180, Jefferson City, MO 65102-0180. Phone: 573-522-4115, ext. 3856.

Printed with soy ink

Inbox

Want to see your photos in the *Missouri Conservationist*?

Submit your photos online via flickr.com/groups/mdcreaderphotos-2026, mdc.mo.gov/magazine-reader-photos or by emailing readerphoto@mdc.mo.gov

1 | Northern parula by Jian Xu, via Flickr

2 | Red-eared slider by Kathryn Krydynski, via website submission

3 | Fawn by John Lofton, via website submission

4 | Red-winged blackbird by Steven Haddix, via Flickr

→ In the December issue we plan to feature even more great reader photos. Send in your best year-round pictures of native Missouri wildlife, flora, natural scenery, and friends and family engaged in outdoor activities. Please include where the photo was taken and what it depicts.

Letters to the Editor

Submissions reflect readers' opinions and may be edited for length and clarity. Email Magazine@mdc.mo.gov or write to:
MISSOURI CONSERVATIONIST
PO BOX 180
JEFFERSON CITY, MO 65102

SCIENCE FOR THE WIN

I enjoyed seeing the article in your February issue about Dan Dey, former USDA Forest Service research scientist, who was named a Missouri Master Conservationist [*In Brief*, Page 9]. I think it's great that the magazine so often highlights how important a good science foundation is to properly managing our forest, fish, and wildlife resources, and, in this case, the role Dan has played in linking the two. Congrats, Dr. Dey!

Jane Fitzgerald Reeds Spring

PRIORITY GEOGRAPHIES

I really enjoyed the *Missouri River Hills* article in your February issue [Page 22]. What a great example of area identification along with deliberate steps to improve key environments and promote habitat. The positive benefits both intended, and surprisingly unintended, were a clear example of the value of this approach to targeted environmental improvement. The public/private partnership demonstrated the vital importance of cooperation in saving our environment.

Have you considered featuring other priority geography areas in future issues?

Thank you for continuing to produce such a wonderful magazine. It covers such a wide variety of conservation-related topics. The emphasis on research to guide your work is so interesting and demonstrates the scientific guidelines you use to direct your work.

Janet Desnoyer Kearney

We will run a series of articles on priority geographies in 2027. —The Editors

Up Front

One warm February morning, I was burning some cedars that had been threatening to invade the woods east of my house when I heard the unmistakable rattling bugle of migrating sandhill cranes. Two V-shapes of more than 30 birds disappeared into the low overcast sky as quickly as they appeared. These early migrants were headed to their breeding grounds largely spread over the northern Great Plains. I had the opportunity a couple years ago to witness the congregation of thousands of cranes on the plains of southern Saskatchewan, Canada. Over the last few years, there have been a growing number of breeding pairs nesting at mid-latitudes, including Missouri, along the Mississippi River.

Birdwatching and study are such great ways to develop a deeper understanding and connection with nature. This month's edition of the *Conservationist* is literally for the birds. This issue highlights the diversity of warblers that migrate to Missouri during spring from all over Central and South America (*Warblers — From A to Y*, Page 10), how callmaking impacted the history of turkey hunting in Missouri (*When a Turkey Calls*, Page 16), and how unique bird species respond to niche habitat management (*The Secret Lives of Fens and Glades*, Page 22).

This year's Missouri Birding Challenge (see inside front cover) offers an opportunity to enjoy quality time outdoors this spring with friends and family, while learning a bit more about this diverse group of wildlife that relies on a variety of habitats across Missouri.

JASON SUMNERS, DIRECTOR
JASON.SUMNERS@MDC.MO.GOV

Our Mission

The Missouri Department of Conservation protects and manages the fish, forest, and wildlife of the state. We facilitate and provide opportunity for all citizens to use, enjoy, and learn about these resources.

Conservation Headquarters

573-751-4115
PO Box 180
Jefferson City, MO
65102-0180

Regional Offices

Southeast/
Cape Girardeau:
573-290-5730

Central/
Columbia:
573-815-7900

Kansas City:
816-622-0900

Northeast/
Kirksville:
660-785-2420

Southwest/
Springfield:
417-895-6880

Northwest/
St. Joseph:
816-271-3100

St. Louis:
636-441-4554

Ozark/
West Plains:
417-256-7161

Have a Question for a Commissioner?

Send a note using our online contact form at **mdc.mo.gov/commissioners**.

Connect With Us!

/moconservation
@moconservation
@MDC_online

Nature LAB at WORK

by Angie Daly Morfeld

The Missouri Department of Conservation team is diverse and dedicated to conserving, protecting, and improving our fish, forest, and wildlife resources.

Malcolm DeBroeck
NATURALIST

As a naturalist at Runge Conservation Nature Center (CNC), Malcolm DeBroeck creates and offers interpretive educational programs focused on natural resource conservation for the public, schools, civic groups, and any other interested organizations. He also oversees the care of Runge CNC's many animal ambassadors, ensuring they are healthy and ready to engage with visitors.

A TYPICAL DAY

DeBroeck starts most days checking on all the animals at Runge CNC, like the spotted salamander and the ornate box turtle, making sure their enclosures are clean and water bowls are filled. Beyond animal care, most of his time is dedicated to preparing and presenting programs, which take place at the nature center, at offsite locations like schools, or even virtually. Many programs are open for public registration and offer a variety of topics, including archery, paddling, nature art, and many others.

"No matter your age or subject of interest, there is something for everyone," DeBroeck said.

"No matter your age or subject of interest, there is something for everyone."

As part of an amphibians program, Malcolm DeBroeck gives students instructions on how to safely use nets to catch and identify the amphibians that they learned about during the classroom portion of the event.

BEN NICKELSON

Runge Conservation Nature Center is open Tuesday–Saturday from 8:00 a.m.–5:00 p.m., with extended hours until 8:00 p.m. on Thursday. Trails are open every day from 6:00 a.m.–9:00 p.m.

NOTABLE PROJECTS

Runge CNC hosts several large events every year for the public, including Holiday Happenings in December. Last year DeBroeck was part of the group that planned this event and its activities. The theme, "Happy HOWLidays," focused on how animals communicate through sound, smell, and body language.

"Hundreds of people came to make animal mask crafts, view interactive displays about communication, and attend special programs," DeBroeck said about the event. "I presented programs, including an interactive owl presentation and a feeding for some of our animal ambassadors.

"Growing up in Jefferson City and visiting Runge, I was very fortunate to experience all of the amazing things it has to offer," DeBroeck said. "It's a privilege to now help create and deliver events and programs that inspire the same curiosity about nature that Runge sparked for me as a child."

HOW YOU CAN HELP

There's always something happening at Runge CNC, so check out MDC's online *Events* page (**mdc.mo.gov/events**) to see what might spark your interest. If you don't find what you're looking for, email Runge@mdc.mo.gov to share what you would like to see offered.

"Even on the quieter days, we would love for you to drop by and visit," DeBroeck said. "You can always explore the exhibits with live animals, a rotating art display, a library, a beautiful viewing window for birdwatching, an indoor treehouse, and five different hiking trails."

His Education

- Bachelor's degree, Southeast Missouri State University: wildlife and conservation biology

In Brief

NOPPADOL PAOTHONG

CELEBRATE MISSOURI TREES

COMMEMORATE ARBOR DAY BY PLANTING NATIVE TREES, PRACTICING PROPER TREE CARE

→ Missouri Arbor Day is Friday, April 3. Missouri has observed the state's official Arbor Day on the first Friday in April since 1886 when the General Assembly declared that day be set aside for the appreciation and planting of trees. National Arbor Day is recognized on the last Friday of April, which is April 24.

MDC's George O. White State Forest Nursery near Licking offers residents a variety of low-cost native tree and shrub seedlings for reforestation, windbreaks, erosion control, and wildlife food and cover. Orders are accepted through April 15. For more information, visit **short.mdc.mo.gov/ZNZ**.

Get information on backyard tree care — including types of trees for urban and other landscapes, selecting the right tree for the right place, planting tips, watering and pruning information, and more — at **short.mdc.mo.gov/Z3J**.

Communities around the state also hold local Arbor Day activities. For more information on Arbor Day and Missouri's Tree City USA communities, visit the Arbor Day Foundation at **arborday.org**.

Missouri forests cover about one-third of the state and provide outdoor recreation, wildlife habitat, natural beauty, and watersheds for streams and rivers. Spending time in Missouri forests can provide a natural health benefit, too. Exposure to nature contributes to your physical well-being, reducing your blood pressure and heart rate, relieving stress, and boosting your energy level.

MISSOURI MASTER NATURALISTS BENEFIT CONSERVATION IN 2025

MDC and University of Missouri Extension thank Missouri's 937 Master Naturalists for volunteering more than 82,000 hours to conserving Missouri's natural resources in 2025.

Missouri Master Naturalists are volunteers who participate in chapter-based natural resource education and conservation programs within their communities. The program is sponsored by MDC and MU Extension. Master Naturalist chapters provide a corps of well-informed volunteers to serve nature and natural resources in their communities. They sometimes assist with MDC research or conduct habitat-improvement projects. They often serve at educational programs or special events conducted with chapter partners within the community.

To become a Master Naturalist, participants must first enroll in a 40-hour core training focused on Missouri's ecological systems and conservation. Core training is conducted at the chapter-level and led by chapter advisors with both MDC and MU Extension.

Missouri has 13 Master Naturalist Program chapters: Boone's Lick in Columbia, Chert Glades in Joplin, Confluence in St. Charles, Great Rivers in St. Louis, Hi Lonesome in Cole Camp, Lake of the Ozarks in Camdenton, Loess Hills in St. Joseph, Meramec Hills in Rolla, Miramiguoa in Washington, Mississippi Hills in Hannibal, North Star in Kirksville, Osage Trails in Kansas City, and Springfield Plateau in Springfield.

"One of the most significant highlights during the year — and there were many — was the organization of a core-training course conducted in the Kirksville area with 11 graduates," said MDC Master Naturalist Program Coordinator Rebecca O'Hearn. "That ultimately resulted in the creation of the 13th chapter of the Missouri Master Naturalist Program, the North Star Chapter. Prior to this, a new chapter had not been organized since 2018."

Learn more about the Missouri Master Naturalist Program, including additional accomplishments and the 2025 Annual Report, at **short.mdc.mo.gov/4A4**.

JOIN THE MISSOURI BIRDING CHALLENGE

Register in April to participate in the 2026 Missouri Birding Challenge (MBC) May 1–22.

MBC participants will compete alone or in teams in five categories based on age, birding location, or experience. Birders will use eBird (**eBird.org**) to record their lists of birds identified in public natural areas around the state or even in their own backyards.

There is a fee of $15 per person, or $10 per team in the youth Fledgling category. Fees are collected by MBC partner Missouri Conservation Heritage Foundation and contribute to migratory bird conservation efforts and projects. Registration fees were reduced from last year based on participant feedback. A new Big Day category will challenge registrants to record as many bird species as possible in the 24 hours of World Migratory Bird Day on May 9.

Once participants complete a category and submit their team's mandatory eBird report, they will be entered into a drawing for fun, bird-related prizes, such as binoculars and gift cards.

Thanks to the Missouri Birding Society, Columbia Audubon, and the Burroughs Audubon Society of Greater Kansas City for sponsoring the 2026 MBC.

Learn more about the 2026 MBC and register between April 1–30 at **mdc.mo.gov/MObirdingchallenge**.

Ask **MDC**

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov or call 573-522-4115, ext. 3848.

Q: This bird's nest is located about 6 inches deep inside of a 4-by-4 wood post in our yard. I never see a bird coming or going. Any ideas what bird made this nest?

It's probably a chickadee's nest. In northern Missouri, seeing a black-capped chickadee is more likely; in southern Missouri, Carolina chickadees predominate. Where the two species come in contact, they occasionally hybridize. Hybrids can sing the songs of either species or something intermediate.

Chickadees are cavity nesters, and their eggs are white with brown spots, often concentrated at one end.

"The bedding of the nest looks like a chickadee — fine grass, moss, and feathers," said Missouri State Ornithologist Kristen Heath-Acre. "A wren's nest would have sticks."

Chickadee nest

CHICKADEE NEST: DOUG PARSON; NORTH AMERICAN SNAPPING TURTLE: SYNDI SILLS

Q: A large western alligator snapping turtle visited my front lawn yesterday. They can be dangerous, can't they?

The turtle in your photo is the more common North American snapping turtle, although we can appreciate why you might think, at first glance, this is a western alligator snapping turtle.

To tell them apart, look for the following features: North American snapping turtles have low ridges that follow the contours of their shells and smooth out as they grow older. Western alligator snapping turtles have rows of spiky raised keels. North American snapping turtles have smaller heads and smaller beaks; western alligator snapping turtles have larger heads and more-prominent hooked beaks. On their tails, North American snapping turtles have raised, saw-toothed bumps; in contrast, western alligator snapping turtles have smoother round bumps. Also, western alligator snapping turtles live in the southern portions of the state, especially the Bootheel's big rivers, deep sloughs, and oxbow lakes. North American snapping turtles make their homes statewide in a variety of wetlands, such as farm ponds, rivers, streams, and lakes.

You are right to be cautious around snapping turtles. They have strong jaws and sharp beaks. They can "snap," hence the name, so the best way to avoid getting bitten is to keep a safe distance.

But she won't be in your yard very long. Snapping turtles are mainly aquatic but venture on land to lay eggs or move among water bodies.

This mother turtle will dig into loose, sandy soil nearby. You won't see a "nest," but might see a patch of freshly disturbed soil. Sometimes people will bend a wire basket over the area to protect the eggs from predators, like skunks, raccoons, and opossums, which can smell the freshly laid eggs for a few days. The holes around the bottom of the wire protective basket must be large enough for the small, hatched turtles to crawl past.

The incubation period isn't a set number of days. Instead, temperature and humidity play a role in the duration it will take for these turtles to develop, which is typically between 75 to 95 days.

Once the small turtles hatch, they will return to a nearby pond, stream, lake, or marsh. Anglers occasionally catch them on hook and line.

North American snapping turtle

What IS it?

Can you guess this month's natural wonder?

The answer is on Page 9.

WILD TURKEY FRIED RICE

Spring means the start of turkey season. There is nothing better than a crisp spring day spent in the Missouri woods, listening to turkeys gobble. Nothing better, that is, than a delicious way to prepare your harvest.

Serves 4

SEASONING THE TURKEY:
1½ cups cooked turkey, diced
1½ teaspoons soy sauce
1 teaspoon vegetable oil
Pinch of salt and freshly ground black pepper

ASSEMBLING THE DISH:
1 tablespoon vegetable oil
3 eggs, slightly beaten and seasoned with salt and freshly ground black pepper
2 strips thick bacon, cut into ½-inch pieces
3 green onions, whites chopped and greens reserved
1 large slice (about ¼-inch thick) peeled fresh ginger root, minced
1 large garlic clove, minced
1½ cups fresh mung-bean sprouts
1 carrot, slices cut diagonally and then in thirds
1 medium sweet red pepper, sliced and cut diagonally
4 tablespoons peanut (or vegetable) oil
1 tablespoon salt
5 cups cold rice (see COLD RICE FOR GOOD RESULTS*)
1 tablespoon (or more) soy sauce
Freshly ground black pepper

This recipe is from *Cooking Wild in Missouri* by Bernadette Dryden, available for $16 at most MDC nature centers and online at mdcnatureshop.com.

PLACE diced turkey in a small bowl and season with soy sauce, oil, salt, and pepper. Cover and refrigerate while preparing the eggs and vegetables.

ASSEMBLE all ingredients within easy reach of wok.

SET wok over medium-high heat. Add vegetable oil; when the oil is hot and shimmering, add eggs and scramble until well done. Remove and set aside.

CLEAN wok with paper towel and heat again. Add bacon, stirring often until browned, but not crisp. Remove, drain on paper towel, and set aside. Drain all but a tablespoon of grease from the wok.

ADD green onion whites, ginger, and garlic, stirring quickly and constantly. Add turkey and stir again. Add bean sprouts, carrot, and red pepper. Cook about 2 minutes, being careful not to overcook. Vegetables should be cooked but still firm and a little crunchy. Remove all from wok into a bowl.

RETURN wok to heat and add peanut oil until hot. Add salt and then rice. Stir fry about 3 minutes to heat and coat rice evenly. Add soy sauce and black pepper and stir. Add eggs, meats, and vegetables, and stir well to combine.

TURN onto platter and top with green onion greens.

***COLD RICE FOR GOOD RESULTS**
Rice must be cold for this dish to be successful. It can be cooked a day in advance and refrigerated. Freshly cooked rice, if used, will turn to mush when fried.

GET OUTDOORS THIS SPRING

Spring in Missouri is magical. Days get longer and warmer. Woods come alive with budding trees and shrubs. Dainty wildflowers spring from the earth. Peepers are peeping, turkeys are scratching, coyotes are calling, owls are hooting, and birds are singing. This is the time of year to get outside and discover nature through hunting, fishing, biking, hiking, birding, camping, kayaking, canoeing, and other outdoor adventures. Through MDC's website, you can find things to do (**short.mdc.mo.gov/45Z**) and places to go (**short.mdc.mo.gov/Z9o**) this spring to soak up all the magic.

NEW MDC BOOKLETS AVAILABLE

Missouri hunters, trappers, anglers, and others can get free copies of MDC's updated booklets on spring turkey hunting, hunting and trapping, and fishing at MDC regional offices, MDC nature centers, and other places permits are sold. *The Wildlife Code of Missouri* is available in limited quantities at MDC offices or online at **short.mdc.mo.gov/oij**. These handy booklets have information on related permits, seasons, species, regulations, limits, conservation areas, sunrise and sunset tables, and more.

Get booklet information online by scanning the QR Code:

2026 Spring Turkey Hunting Regulations and Information

A Summary of Missouri Hunting and Trapping Regulations

A Summary of Missouri Fishing Regulations

Wildlife Code of Missouri

WHAT IS IT?

VIRGINIA BLUEBELLS

Virginia bluebells are one of our most stunning early spring wildflowers. These perennials are popular in native gardens, growing to 2 feet tall, often in large groups. Flowers begin blooming in March, growing in clusters and hanging like bells, reaching about 1 inch long. The buds start out pink and turn light blue on opening. Pink-flowering bluebells are not rare, and a white form exists, too.

NOPPADOL PAOTHONG

Warblers — From A to Y

A 'who's who' guide to these entertaining pint-sized songbirds

by Matt Seek

For people who are tuned in to warblers, each day in migration season is like a treasure hunt: We never know which ones we'll find.

— KENN KAUFMANN

Sometimes, a writer wanders into a forest and can't find his way back out. He sets off down a well-trod trail, but then something in the canopy catches his curious eye. So, he follows the bright, flitting bird into a cathedral of trees. Then he spots another bird ... and another ... and another. And he follows each of them until he finally stops, looks around, and realizes he hasn't a clue how to get back on the path.

That's where I found myself after accepting an offer to write a story about wood-warblers.

Of the 115 species in the family *Parulidae*, about half are tropical residents and half are long-distance migrants that nest in North America and winter in the Tropics. Over 40 species have been recorded in Missouri, over 30 turn up with regularity, and over a dozen nest here.

Unless you're a birder, you probably don't notice this tropical reef of small, brightly colored birds that wash, wave after wave, into our forests, woodlots, and tree-lined backyards every spring. My intent, as I bushwhacked through thickets of species accounts, was to write a story that would change that.

But good writing — the kind that makes you care — is specific and precise and eschews generalities. With 40-plus species to cover, how could I be anything but general?

My way out of the woods was to forgo the idea of a traditional narrative and instead write a series of short sketches for 30 of Missouri's most common warblers. Though brief, I hope these offer a nugget of something interesting — perhaps even fascinating — about each bird.

A warbler is a hyperactive, ravenous little creature, akin to a sentient caffeine molecule that flickers like a sunburst through the treetops and suddenly disappears, Harry Potter-style, before you can hoist up your binoculars.

Often, all you get is a brief look. A flitting flash of color. And then it's gone.

But that doesn't make the moment any less magical.

American redstart

Species Sketches

American redstarts are so named for their flash-and-flush hunting technique. As a redstart hops from branch to branch, it droops its wings and flicks open its tail, revealing garish Halloween-orange spots. (Females and immature males have lemon-yellow spots.) The sudden flash of color startles leafhoppers and other insects, which flush from their hiding places only to be snapped up by the hungry hunter. Redstarts are illustrative of the frenetic pace at which most warblers move. One study found that foraging redstarts change perches, on average, 27 to 30 times per minute.

Warblers shine brightest in the spring. In the fall, their sunshine-yellows and lime-greens fade to drab gray tones, like Dorothy returning to Kansas from the Emerald City. The somber colors

Bay-breasted

AMERICAN REDSTART: ONDREJPROSICKY, DREAMSTIME.COM; BAY-BREASTED: JIM RATHERT

Blackpoll

Blackburnian

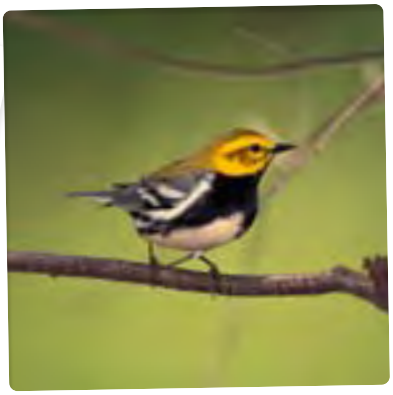
Cape May

can be confusing to birders, and none generate more consternation, perhaps, than **bay-breasted** and **blackpoll** warblers. In spring, the two birds look nothing alike. Bay-breasted males have a reddish-brown wash on the crown, neck, and flanks. Blackpoll males are black-capped and strikingly streaked. But in fall, both species transform into nondescript, mirror images of each other, so similar in appearance that frustrated birders sometimes list an unidentifiable bird as a "baypoll." If you find yourself in a similar predicament, the Cornell Lab of Ornithology offers this advice: "One surefire way to distinguish them is by the color of the soles of their feet — bluish-gray in bay-breasted, yellow in blackpoll." Good luck with that.

The **black-and-white** warbler's genus, *Mniotilta*, means "moss-plucking." It's a fitting description for this bird's un-warbler-like habit of creeping along tree trunks and limbs like a nuthatch, using its decurved bill to probe for insects hiding in the bark. At first glance, males and females appear similar, but closer inspection reveals subtle differences, the most noticeable being that females lack the broad black ear patch of males. Black-and-whites are one of about a dozen warblers that nest in Missouri. They build cup-shaped nurseries in Ozark leaf litter, usually at the base of a tree or against a log.

In 1958, a graduate student named Robert MacArthur turned in his dissertation and turned what we know about how nature works on its head. And he did it by watching warblers. According to Gause's Law, species that compete for the same limited resource cannot coexist. One will eventually outcompete the others. But warblers in the spruce woods of Vermont and Maine seemed to defy this foundation of ecology. Five species — including the spectacular, flame-faced **blackburnian** warbler — nest in the same spruce trees and eat the same insects. How, then, could they coexist? MacArthur's insight was to painstakingly track where each warbler spent its time. He found that blackburnian and **Cape May** warblers frequented the tops of trees, bay-breasted and **black-throated green** warblers split up the inner and outer branches midway up, and **yellow-rumped** warblers stayed lower down. MacArthur's careful observations offered evidence that multiple species could coexist if they used the resource in subtly different ways. His dissertation is one of the most frequently cited papers in ecology, and this concept of resource partitioning is still being studied and refined today.

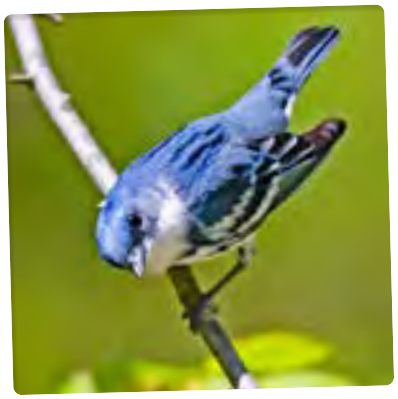
Black-and-white



Black-throated green

Yellow-rumped

BLACK AND WHITE: LLMCKINNE, DREAMSTIME.COM; BLACKBURNIAN: TONY; ADOBESTOCK.COM; BLACKPOLL; BLACKTHROATED GREEN, CAPE MAY, YELLOW-RUMPED: JIM RATHERT



Cerulean

Chestnut-sided

Common yellowthroat

Blackpoll warblers pass through Missouri in the spring, en route to breeding grounds in the spruce and fir forests of Alaska, Canada, and the northeastern U.S. But in the fall, nearly all blackpolls — even those that nest in Alaska — travel to the East Coast and then migrate south over the Atlantic Ocean. Once they reach the Tropic of Cancer, trade winds deflect the half-ounce birds westward toward landfall in South America. This open ocean crossing — thought to be the longest made by any songbird — can span 1,800 miles and take up to 88 hours of nonstop flight.

Black-throated green warblers get chatty during nesting season. Lemon-headed males will pick a conspicuous perch high in the treetops and belt out song after song. Often described as a buzzy, high-pitched *zoo-zee, zoo-zoo-zee*, some birders remember it as *trees, trees, I love trees*. Regardless of what it sounds like to your ears, the warblers themselves seem to enjoy it. One motor-beaked male sang 466 songs in an hour.

On their boreal breeding grounds, Cape May warblers are budworm specialists. Nearly a third of their diet is composed of these inch-long, reddish-brown caterpillars, and Cape May populations swell during budworm outbreaks and shrink during budworm declines. But on their wintering grounds in the Caribbean, they supplement their insectivorous diet with fruits and nectar. As an adaptation for lapping up nectar, a Cape May's tongue is curled and somewhat tubular.

Cerulean warblers are striking birds, but to see one, you have to crane your neck and peer high into the canopy of an old-growth, bottomland forest. Once abundant throughout the Ohio and Mississippi river valleys, cerulean numbers have plummeted more than 65 percent since the 1960s. The Ozarks continue to be a stronghold for the species, and a hike along a spring-fed stream in late May might reward you with an interesting sight: When leaving her nest, a female cerulean will sometimes hop over the side and drop vertically with her wings tucked closed. Only after she's fallen well below the nest will she take flight. Biologists who have observed this unusual behavior call it "bungee jumping."

Dapper and diminutive, **chestnut-sided** warblers leverage their size to forage in places heavier warblers can't reach. Often seen hopping from perch to perch in the skinny outer branches of shrubs and trees, these acrobatic birds capture nearly 70 percent of the insects they eat from the underside of leaves. (On their wintering grounds in Central America, they capture about 90 percent of their prey from under leaves.)

Common yellowthroats are one of North America's most widespread

Blue-winged

Kentucky

Louisiana waterthrush

CERULEAN: LEV FRID, SHUTTERSTOCK.COM; BLUE-WINGED, COMMON YELLOWTHROAT: NOPPADOL PAOTHONG; LOUISIANA WATERTHRUSH: URIADNIKOV, ADOBESTOCK.COM

Hooded

Nashville

warblers, breeding throughout the U.S. and Canada except for the Desert Southwest. They frequent dense, low-growing vegetation, often at the edges of marshes and other wet areas. Their persistent *wichity-wichity-wichity* calls make them easy to locate, but their habit of sneaking through tangled vegetation means they're not always easy to see.

Although the two birds look nothing alike, **golden-winged** warblers and **blue-winged** warblers share 99.97 percent of their DNA. They hybridize frequently, and their offspring express a range of characteristics from both species. Two phenotypes occur often enough to be named: **Brewster's** warbler, which looks like a blue-wing with a white belly, and **Lawrence's** warbler, which looks like a golden-wing with a yellow belly. Blue-wings have expanded their range in the past century, while golden-wing numbers have dropped precipitously, partly as a result of competition and hybridization with their close cousins.

Male **hooded** warblers wear a distinctive black hood with a golden-yellow mask. First-year females have few, if any, black feathers on their heads, but older females vary extensively in their headwear. Some have little or no black, while others have complete dark hoods and look nearly identical to males. On their breeding grounds, which include southeastern Missouri, each male sings a distinctive song (at least distinctive to other hooded warblers). Males remember their neighbor's songs from year to year, which is thought to decrease the amount of energy they must spend defending territories. When hunting insects, hooded warblers flick open their tails to reveal startling white spots, a behavior similar to American redstarts.

Many male warblers sing two types of songs — one to attract a female and a different (though similar-sounding) one to defend a territory. **Kentucky** warblers are more utilitarian, singing only one song for both purposes. Listen for their bright, rolling warbles ringing through the thick understory of bottomland forests across Missouri. Just be aware that to the untrained ear, a Kentucky warbler's song sounds similar to the *teakettle-teakettle-teakettle* of a Carolina wren.

With their brown base colors and boldly streaked chests, it's easy to see how Louisiana and **northern waterthrushes** — which are warblers, not thrushes — got their names. Although they're not known to hybridize, both species habitually bob their tails and look incredibly similar. Several clues help tell them apart — **Louisiana waterthrushes** prefer to forage near running water; northern waterthrushes usually forage along the edges of stagnant pools like marshes. Louisiana waterthrushes have an unmarked or lightly streaked throat; northerns have extensive streaking on their throats. And lastly, Louisiana waterthrushes nest in Missouri; northerns pass through in spring on their way to northern nesting grounds.

Often, the only look you get of a warbler is its underside. Because of this, hardcore birders memorize warbler tail patterns, many of which are distinctive and all that's needed to ID a species. **Magnolia** warblers, both the strikingly patterned adult males and the slightly less-striking females and immatures, have diagnostic tail patterns — a wide white band against the body with a wide black band at the tip of the tail.

Although they're named after a town in Tennessee, **Nashville** warblers nest far north of the state. Two separate populations breed in North America, one east of the Mississippi River and another in the Pacific Northwest. Nashvilles nest in a variety of brushy, second-growth habitats, and, unlike many warbler species, their numbers have stayed steady or even increased slightly during times of extensive forest clearing.

Springtime brings an odd affliction to birders. Commonly known as "warbler neck," it is diagnosed by persistent pain in the capitis and trapezius muscles caused by spending hours peering into the tops of trees. **Northern parulas** — dainty,

Magnolia

Northern parula

CHESTNUT, KENTUCKY, HOODED, MAGNOLIA, NASHVILLE, NORTHERN PARULA: JIM RATHERT

brilliantly colored, and canopy-loving — are a leading cause of the condition. In southern states, parulas hide their hanging, pouchlike nests in dangling Spanish moss. In Missouri, they hide them in tufts of beard moss (which is actually a lichen). This secretive habit, along with their propensity to live high in the canopy, makes it difficult to study their nesting behavior.

Ornithologists continually refine the number of bird species throughout the world. Using genetic analysis, seemingly unrelated species are sometimes lumped together as one species. Conversely, other individual species are split into two or more different species. In 2025, what was previously known as the yellow warbler was split into the migratory **northern yellow** warbler (which visits Missouri) and the non-migratory **mangrove yellow** warbler. Brown-headed cowbirds frequently dump their eggs in yellow warbler nests. When a female finds her nest parasitized by a cowbird, she often builds a new nest atop the unwelcome egg (and, unfortunately, any of her own). If cowbirds persistently return, this behavior can result in a stack of up to six nests.

One of the few *Parulids* that is more common in the west than the east, **orange-crowned** warblers pass through Missouri in both spring and fall. The orange crown is rarely seen in these relatively nondescript warblers. It's usually visible only when an agitated bird raises its head feathers. On their nesting grounds, males form "song neighborhoods," where several birds in adjacent territories mimic each other's distinct song patterns. These neighborhoods have been recorded to persist for over a decade.

Ovenbird

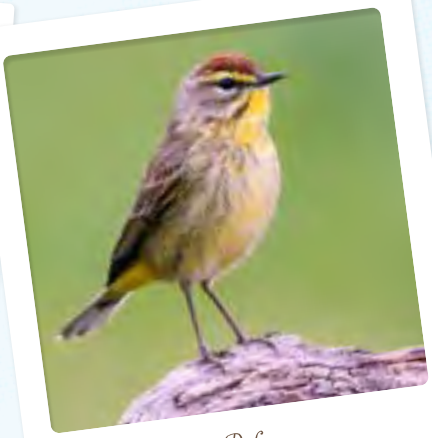
Orange-crowned

Cryptically colored **ovenbirds** are more often heard than seen. The poet Robert Frost immortalized the male's exuberant *teacher-teacher-teacher* song like this: "There is a singer everyone has heard, Loud, a mid-summer and a mid-wood bird ..." Ovenbirds nest in mature forests throughout Missouri. Females clear out a circular area among leaf litter on the forest floor, weave a domed nest, and camouflage the top with leaves and sticks. The structure resembles a Dutch oven, which is where the species gets its name.

Although its name conjures images of tropical beaches, **palm** warblers nest in the boreal forests of far northern Canada. In fact, among warbler species, only blackpolls nest at higher latitudes. Palm warblers winter in the Caribbean and along the Gulf Coast, migrating through Missouri in spring and fall. Males and females look identical, but eastern birds have more yellow on their bellies compared to western birds. Both subspecies nervously twitch their tails as they forage along the ground.

Pine warblers are well-named. They nest in pine forests, including those in southern Missouri and northern Arkansas. And, although insects comprise most of their diet, their sturdy bills allow them to be one of the only warblers to regularly eat seeds (especially pine seeds). Most *Parulids* are long-distance migrants that spend winter in the Tropics. But pine warblers winter primarily in the southeastern U.S. This — along with their seed-eating ability — allow these elegantly subtle warblers to migrate into Missouri in early March, usually

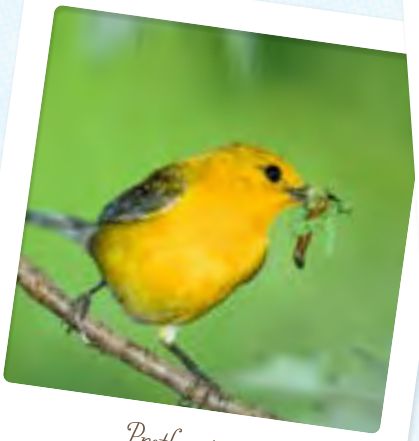
Northern yellow



Palm

Pine

OVENBIRD, ORANGE-CROWNED, PROTHONOTARY, TENNESSEE, WILSON'S: JIM RATHERT; PINE: GREGORY, STOCK.ADOBE.COM



Prothonotary

Wilson's

the first to herald the oncoming rush of spring migrants.

Named for the color of the robes worn by papal clerks in the Catholic church, **prothonotary** warblers blaze like a ray of pure sunshine in their swampy haunts. One of only two warblers to nest in tree cavities (the other is **Lucy's** warbler, a western species), prothonotaries often use holes excavated by downy woodpeckers. Sometimes called "swamp warblers," prothonotaries nest in soggy bottomland forests along the edges of big rivers.

Tennessee warblers nest far north of Tennessee, in the spruce forests of Canada and Maine. In winter, they frequent shade-grown coffee plantations in Central America and the Caribbean. Like several other *Parulids*, Tennessee warblers supplement their diet of insects with fruits and nectar in winter. They are an unrepentant nectar thief of tubular tropical flowers, using their sharp bills to pierce flower tubes and "steal" sweet nectar without distributing any of the plant's pollen.

You won't get warbler neck from searching for **Wilson's** warblers, but you might tweak a nerve trying to follow this energetic yellow floof as it bounces among the underbrush. One of the continent's smallest and most widespread warblers, Wilson's employ a variety of behaviors on their wintering grounds. Some vigorously defend territories, others float among territories, and still others join mixed-species flocks.

Unfortunately misnamed, **worm-eating** warblers eat insects and spiders, not earthworms. These cryptically colored warblers are among a suite of ground-nesting *Parulids* in the Ozarks, which includes Louisiana waterthrushes, ovenbirds, black-and-white warblers, and Kentucky warblers. If flushed from her nest, a female worm-eating warbler often flutters low across the ground, then fans out her wings and tail, acting injured to lure predators away.

Yellow-rumped warblers were once considered two separate species — myrtle warblers in the east and Audubon's warblers in the west. As a single species, they are one of the most widespread and common warblers in North America. "Butterbutts," as they're often nicknamed, owe their success to a jack-of-all-trades approach to foraging. They hunt at a variety of vegetation levels, gleaning insects from leaves, capturing flying insects with quick sallies, and eating berries and other fruits in winter. Though yellow-rumps nest north and west of Missouri, their wintering habitat includes the southern half of the Show-Me State.

With a brilliant, goldenrod-colored neck, **yellow-throated** warblers command attention. But you'll have to crane your neck to spot one. These dazzling birds typically sing, forage, and nest high in the forest canopy in the southeastern U.S., including Missouri. Luckily, they move more methodically than other warblers, creeping around branches like nuthatches and probing into crevices with their beaks for insects. In the fall, yellow-throated warblers don't fly far, spending winter along the Gulf Coast and in the Caribbean. ▲

Matt Seek is the editor of Xplor, *MDC's magazine for kids.*

Tennessee

Worm-eating

Yellow-throated

When a Turkey Calls

The history of callmaking and how it shaped turkey hunting in Missouri

BY GILBERT RANDOLPH

Spend the night in an Ozark holler and you have a good chance of waking up to the echoes of gobbling toms and calling hens. It's rough country, with clear streams, steep ridges, and views that you won't soon forget. Missouri's Ozarks were central to the reintroduction of the wild turkey nationwide. This region is also home to a long history of turkey callmaking that helped to shape turkey hunting as we know it today.

The 1930s saw the conception of the Missouri Department of Conservation and soon after, the official closing of turkey hunting. Widespread habitat loss and overexploitation by market hunters caused the turkey population in Missouri to dwindle to an estimated 2,500 individuals by 1952.

The recovery effort took off when birds were trapped from areas with known turkey populations and transferred to 213 sites in 91 counties where sufficient habitat existed for them to gain a foothold. The local communities where relocation occurred helped by improving habitat, leaving extra grain on field edges, and reporting poaching so that spring gobbles could be heard echoing in the woods again.

Thanks to Missouri hunters, biologists, and landowners, turkey numbers rebounded and in 1960, the first turkey season since 1937 was opened.

There followed a boom in interest for turkey hunting. At the time, however, commercialized turkey calls were not readily available for most people, and neither was information on how to effectively call or hunt turkeys. The Ozarks, most famously Shannon County, is a haven for turkey calling tradition and soon became one of the most iconic locations for turkey hunters and turkey calls nationwide.

A Distinctive Style

It's easy to take for granted the mass production and development of turkey calls in today's callmaking market. Every sporting goods store and Walmart will have a mouth, slate, or box call available to buy. Initially, however, turkey calling and callmaking itself were niche skills.

Brent Rogers, an avid turkey call collector and historian, said that some of the old timers would use leaves as a primitive mouth call. They also would drive a square-headed nail with slate or soap stone to use as a friction call. Rogers has an extensive personal collection of calls from the Eminence area, with calls from the likes of Dan Searcy, David Ferguson, carving work by Jack Burrus, and more.

"The Eminence tradition of turkey callmaking has a very distinctive style," Rogers said. "Many have come to appreciate Eminence long boxes, adorned with artistic renderings in the form of woodburning, paintings, or carvings of local scenes. They combine the value of small-batch appeal, similar to bourbon, with the notoriety of an instantly recognizable brand. The late Earl Mickel was a notable turkey call collector whose 1994 book, *Turkey Callmakers Past and Present: Mick's Picks*, was perfectly

NOPPADOL PAOTHONG

> **"The Eminence tradition of turkey callmaking has a very distinctive style."**
>
> — BRENT ROGERS

One of Dan Searcy's rare painted calls (right), made from all red cedar with a painted strutting gobbler bust and dogwood flowers. One of maybe a hundred of this style, it is estimated Searcy stopped producing them altogether after the 1995-1996 timeframe.

Made in 1982 when Clarence Huffman lived in Birch Tree, MO. This call (far right) oozes Clarence's classic flat, Grandma Moses-style of artwork. Made of all red cedar with a patina.

timed to inspire many new collectors during a new Golden Age of wild turkey hunting and callmaking. His coverage of Eminence makers, as well as the popularity of Neil Cost's long boxes, which were Eminence-inspired, was a one-two punch."

Bill Jensen, a callmaker who grew up hunting in the St. Francis Mountains with his father, recalled a similar technique being used.

"The best leaf was a greenbrier vine leaf," Jensen said. "They wouldn't leaf out during the season, but the cherry leaves would green up."

The technique was similar to modern tube calls, and they would also use snuff cans and dried gourds to achieve a similar effect.

They did use box calls to hunt as well, and Jensen said the box calls that his father and his friends used were very compact compared to the larger box calls that became the symbol of turkey callmaking in Eminence.

The style of box calls that became most associated with the Ozarks were called fence post, longbox, and boat paddle calls. The terms boat paddle and longbox refer to the larger size of the box calls from Shannon County. While not all the calls fit this pattern, they tended to be significantly longer and as time went on, had a handle not only on the lid of the call, but also on the box itself. Rogers credits Robert Searcy with the first handled box call with known provenance.

Fence post calls are exactly what the name implies. Callmakers would take cedar fence posts, which provided a source of easily accessible, already dried wood, and make turkey calls out of them. Cecil Fry is credited with coming up with the term. In a conversation with Fry and callmaker Walter Winterbottom, reported by Del Kruzan, the two had gone on a hunt together. After a tough, cloudy morning with no gobbling, Fry told Winterbottom that he needed to go back to his car to get his "caller." He returned with the biggest box call Winterbottom had ever seen and when Winterbottom asked him what it was, he said, "I call it my cedar fence post caller."

An Ozark Tradition

The tradition of callmaking didn't start with the 1960 turkey season. For families like the Searcys, their connection to turkey calls stretches back to the early 1900s.

"Most people made their own calls because they weren't broadly available," says Robert Searcy, Shannon County resident, whose father and grandfather made turkey calls.

One call from Searcy's grandfather is dated 1912, before Missouri turkey seasons were shut down in 1937. That call, as reported in a 2004 *Rural Missouri* article, was given to Searcy's father, Dan, around 1943 by a friend who said, "Your dad made

DAVID STONNER

me this turkey call. There won't ever be any more turkeys in this country, so I'll just give you this call."

It's likely thanks to this ironic evaluation of turkey populations that the call wasn't lost to time and has been preserved by the Searcy family.

A fascinating tidbit of history from that same article is that the elder Robert Searcy took Dan Searcy to Kansas City when he graduated high school to enroll him in the Kansas City Art Institute. Discouraged because he felt he was too far behind the other students, Searcy quit after just four days. While he may not have recognized his artistic talent at the time, Searcy's skill in both the technical and artistic aspects of callmaking are undeniable. He has been featured in articles in the *Kansas City Star*, his calls have made it all across the states and are still highly sought after by collectors.

David Ferguson, a callmaker and historian who lives in the Eminence area, was encouraged to start building calls by Searcy after a 2008 hunting camp where they were sharing stories about fence post calls and the history of the area. Now, Ferguson's calls are highly sought after, have won multiple awards, and have been featured in film and in articles.

When talking about the fence post calls, he said, "The old timers would cut those straight cedar poles for fence posts.

"Walter Winterbottom, Dan Searcy, Swiney Rayfield, Cecil Fry, Clarence Huffman, Jake McCormick, Jack Burrus, and others have contributed and helped pass on their callmaking heritage."

— DAVID FERGUSON

They lasted forever. Harley and Art Patterson had a place up there … he was older than my grandpa and grandma, but that'd put it about the early 1920s when they were driving them posts in the fields up there. Those posts are still standing."

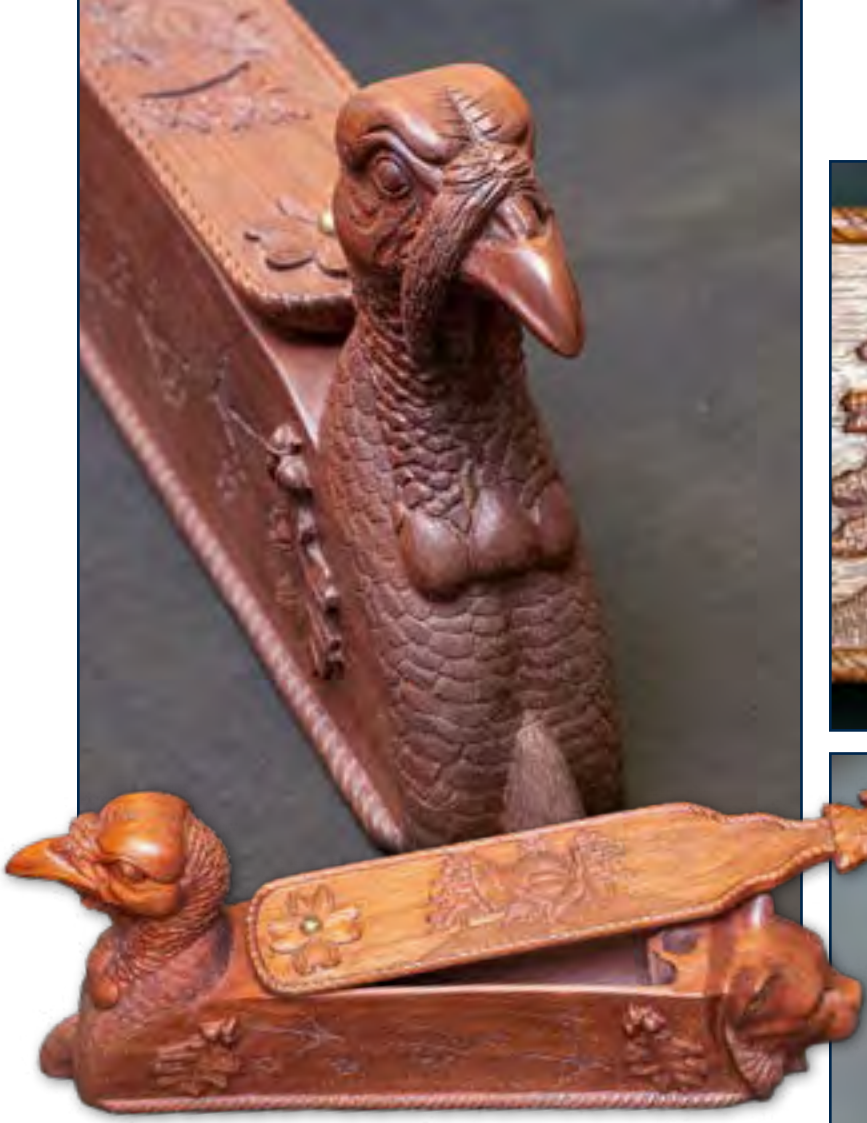
Few other places can so definitively claim a unique contribution to turkey hunting history.

"The Eminence area has produced more noted turkey callmakers than any other area in the country," said Earl Mickel, collector and author of *Turkey Callmakers: Past and Present*. Walter Winterbottom, Dan Searcy, Swiney Rayfield, Cecil Fry,

This is Bill Rogers' original #1 Rogers Gobbler Getter slate call. Made in 1968, this was Bill's personal hunting call with which he allegedly killed over 25 gobblers. Bill brought some clever innovation here: One was the leather-hinged, wooden cover that protected the slate from being polished smooth when carried in a pocket (and thus not requiring a sanding before playing it again). The second was the thin, rectangular striker that was carried inside the body of the call. A thin piece of rawhide "string" was tied across the opening to keep the striker contained within the body of the call (not pictured).

This owl call, made by Jack Burrus, is another type of call used by turkey hunters. The turkeys will answer the owl call and reveal their location.

A rare Winterbottom style. Made of sassafras with a cedar lid. This style call was made between 1968 and 1970. This call is high pitched and is a killer field call.



Jack Burrus created this call out of walnut, and it captures, in intricate detail, scenes a hunter may see during a spring turkey hunt in Missouri.

Turkey wing bone call made by Swiney Rayfield.

A fence post call and a scratch box, painted in the same motif, made by Jack McCormac in 2000.

Clarence Huffman, Jake McCormick, Jack Burrus, and others have contributed and helped pass on their callmaking heritage."

Eminence quickly became a destination spot, drawing hunters, writers, and callmakers who wanted to experience chasing birds in the iconic terrain and for many hunters, pick up a locally made call. Many of turkey hunting's most recognizable names, from Dick Kirby, Rob Keck, and Earl Mickel, made pilgrimages to the area. All of them left with stories they'd remember for a lifetime.

Calling Competitions

Before turkey calling knowledge became broadly publicized through books, articles, television, and social media, calling competitions served as the main hub for callers, hunters, and callmakers to learn from each other.

The first turkey calling contest in Eminence, according to Del Kruzan's article, *Callmakers of Eminence*, was held in 1968, the year of the Eminence Centennial. Dan Searcy won first place in the contest and was featured in the local paper. Kruzan credits this competition as the emergence point for Dan's journey as a callmaker, though he wouldn't sell a call until 1994, with the exception of a pair of calls sold to a visiting Chicago woman for $15.

Callmaking competitions started popping up everywhere, such as the Festus-Crystal City Conservation Club Calling Competition, which is the longest running competition in the state.

"Every community, every small town across the midwest had a turkey calling contest," said Ray Eye, outdoors communicator, award winning caller, and all-around turkey hunting legend. "It was a big deal … we would start turkey calling contests in January and go all the way through April. Some of the local contests, like Steelville and Potosi, would go through turkey season … it wasn't unusual to have 600 people in the audience."

Calling competitions became a central aspect of turkey hunting culture, bringing people together and breathing life to the upstart industry of turkey callmaking. Even though turkey callmaking has gone mainstream, the craft is still being celebrated by private collectors, events such as the National Wild Turkey Federation's Grand National Callmaking Contest, and local calling contests.

DAVID STONNER

Keeping the Stories Alive

A number of calls from Shannon County callmakers can be viewed in person, both at the Shannon County Museum and the Twin Pines Conservation Education Center. David Ferguson helped to create these exhibits. Visitors are welcome at both; Twin Pines is open Wednesday and Thursday from 8 a.m.–5 p.m. and the Shannon County Museum is open Tuesday through Saturday 10 a.m.–1 p.m.

"Turkey hunters are very passionate about their pursuit, valuing both the experience of the hunt and the tools that are part of that chess match with a wily gobbler," Brent Rogers said. "The leap from call owner to call collector isn't a big one, as most turkey hunters have their favorite calls or favorite callmakers. Turkey callmaking is actually a uniquely American art form, as wild turkeys are only native to North America. From Native American wingbones thousands of years old to 20th century Eminence calls, there is a story told through turkey calls. It encompasses communication between species, our roots as people of the land, and tool-making innovation and craftsmanship."

"There is a story told through turkey calls. It encompasses communication between species, our roots as people of the land, and tool-making innovation and craftsmanship."

– BRENT ROGERS

To learn more about callmaking history, the Callmakers and Collectors Association of America, which has cataloged historical information on a variety of callmakers, offers a quarterly newsletter and hosts multiple events every year. Brent Rogers has published an exhaustive history of turkey call making, *The Origin and Evolution of Turkey Calls*. Rogers shared a new resource for those interested in learning more about the history of turkey calls.

"A new organization has just been formed to preserve and promote history related to the wild turkey," shared Rogers. "The American Wild Turkey Historical Foundation has just rolled out a digital museum called the Wild Turkey Archives at **AWTHF.org**. While we aspire to have a physical museum in the future, we will be continuously building free online content featuring photos, audio, and video of all things wild turkey, from the Native Americans to the present."

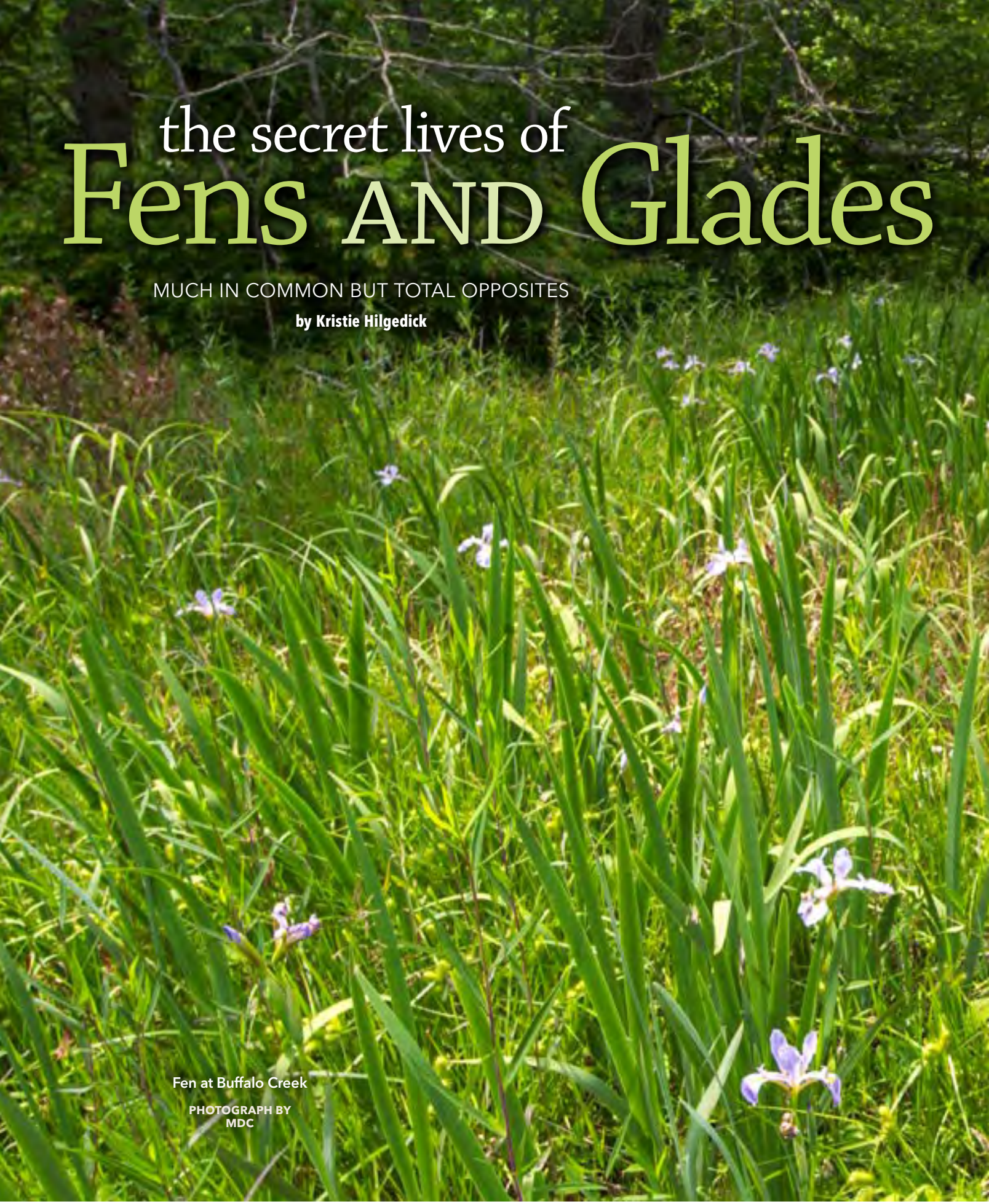
The National Wild Turkey Federation also hosts a callmaking competition at its yearly national convention, which can be a great place to find calls from Missouri callmakers and network with other collectors and calling enthusiasts. ▲

Gilbert Randolph is a writer and an avid outdoorsman. When he's not creating stories in the digital space, he's exploring nature and sharing it with people.

the secret lives of Fens AND Glades

MUCH IN COMMON BUT TOTAL OPPOSITES

by Kristie Hilgedick



Fen at Buffalo Creek

PHOTOGRAPH BY MDC

Humans are naturally attracted to shady, cool, sun-dappled spaces. But people who aspire to be expert-level aficionados of Missouri's flora and fauna might consider cultivating an appreciation for lesser-known, sunnier natural communities like fens and glades.

What is a fen? What is a glade? Put very simply: They're opposites. Fens are wet, glades are dry. But they can intersect in the same space, and it's even possible for a small fen to exist on a glade.

"Normally glades are bone-dry. But even glades can have places that are seepy and wet. The plants and wildlife that live there are adapted to extremes," said Natural History Biologist Susan Farrington.

Fens, sometimes called seeps, are a type of wetland. They're characterized by a constant, or near-constant, supply of groundwater emerging from the landscape. In a fen, the soil is too wet for trees to thrive, which creates sunny openings in the canopy. But they're good places to observe bulrushes, ragwort, brown mosses, sedges, cattails, and more.

It's tempting to think of a fen as a small wet prairie, but the two are not the same. Grasses are more conspicuous on prairies. Fens stay wet throughout the year, whereas prairies are seasonally wet. This means fire plays a less-important ecological role for fens, but some fens may benefit from periodic, patchy, low-intensity burns.

Seen from a road or hiking trail, fens are easy to overlook. To the casual onlooker, a soggy spot dominated by sedges and cattails offers little interest. But to a keen-eyed observer, they teem with fascinating wildlife and rare plants.

A glade, on the other hand, is a dry, hot, and sunny opening in a woodland where the bedrock is close to the surface. The soil is poor and shallow, but hardy plants — some associated with deserts — thrive there. With a rich variety of grasses and native wildflowers, glades support grasshoppers, pollinators, and other insects. They, in turn, make glades excellent habitat for wild turkeys, songbirds, and reptiles.

Lichen grasshopper

Eastern collared lizard

Forming Fens

Missouri is home to numerous types of "groundwater seepages," including Ozark fens, prairie fens, forested fens, glacial fens, acid seeps, and saline seeps.

More recently, scientists have described a new type of ecological site called "karst fen," which occurs in association with calcium-rich, dolomitic bedrock. In 2020, researchers began surveying the soil and plants at 30 karst fen sites to gather reference data for this unique habitat. Their work will help land managers and private landowners better understand and care for these small wetlands.

Except for glacial fens found in the rolling hills of Missouri's northern counties, the remaining types of fens occur in the Ozarks.

"When you get into a valley system with unweathered dolomite, you're ripe for glade production as well as fen production. They both start occurring on the landscape at about the same location," explained Kyle Steele, ecologist for the U.S. Forest Service. "Fens often have bedrock below them (although not all the time) or they're in a valley system next to unweathered bedrock. Water can't permeate it, so it moves laterally across it."

Rock pink blooms on Wildcat Glade Natural Area

Running water dissolves dolomite and limestone easily. Missouri — riddled with caves, losing streams, sinkholes, and springs — is famous for its karst topography.

"Large areas of the Ozarks are completely weathered. It's not until you get into these deep valley systems — the upper parts of them — that you start finding glades and fens," he said.

Rather than collecting in flat or depressional areas, sometimes fens form on steeper slopes. When this happens, scientists call it a "hanging fen." But the soil is shallow — often a few inches at most to the bedrock below.

Mapping fens accurately is a challenge because water is chaotic by nature.

"Is the water being captured by a rock crevice? Or is the rock serving as a conduit? Eventually it's going to spill out somewhere. That's where you see fen plants," said MDC Wetlands System Coordinator Frank Nelson. "The leaky lithology of karst is driving plant distribution."

Missouri's mineral soils mainly have particles of sand, silt, and clay.

"We have extremes of wet and dry, and so plant material decomposes quickly. In a fen, over time, the organic matter accumulates above the mineral soil. Fens are one of the few places in Missouri where the soil is organic. It's mucky."

To prove his point, Nelson dug a hole, lifting out glistening, mucky, black soil.

"Take a handful, squeeze it," he said.

Prompted by a squeeze, water ran from the clump like a sponge.

Pioneers used these naturally organic places to farm, garden, and raise livestock, usually draining them in the process. Fens were a boon for the settlers, but their agricultural practices were a hardship for the plants and wildlife living there.

Scientists continue to work toward getting a firmer grasp of their understanding of fens, which are highly variable from location to location.

"What is a fen? How have they been degraded over time? How could you restore them?" Nelson asked. "They

LICHEN GRASSHOPPER, SMALL WHITE LADY'S SLIPPER, GRASS PINK ORCHID, HINE'S EMERALD DRAGONFLY, YELLOW-BREASTED CHAT: JIM RATHERT; EASTERN COLLARED LIZARD, WILDCAT GLADE, SWAMP METALMARK: NOPPADOL PAOTHONG; BARTON FEN: DAVID STONNER

Barton fen in Iron County

have been overlooked and modified drastically, but I think there still are opportunities."

Botanical Sticky Traps

On a trip to Mark Twain National Forest near Bixby, Nelson offered a glimpse into the secret life of fens.

A long time ago, vast sheets of glacial ice blanketed northern Missouri. Powerful enough to push massive erratics (boulders) southward, the glaciers influenced the course of the Missouri River and subtly affected the Ozarks, too. Millenia ago, the Ozark's climate was colder and wetter than it is today. Because fens are groundwater-fed, they currently remain microhabitats of cold water refugia, capable of replicating cool, moist conditions from long ago and moderating the harsher conditions of today's surrounding landscape.

This allows plants that were plentiful 10,000 years ago, and plants that are still common in the northern U.S. and Canada today, to persist — albeit in smaller quantities — in Missouri's fens.

For example, an orchid called the small white lady's slipper can be found in the calcareous fens of western Minnesota. These orchids are rare in Minnesota, but they are especially rare here, where one of the few places this plant is found in Missouri is on the seepy ledge of a dolomite glade in southern Missouri.

Other glacial relicts found in fens are queen of the prairie, marsh bellflower and snake-mouth orchid, and tuberous grass pink orchids.

Farrington noted Ozark fens are among the few places where federally endangered Hine's emerald dragonflies occur. Featuring iridescent emerald-green eyes, these dragonflies spend their larval stage in crayfish burrows before emerging.

"Why the crayfish don't eat them, we don't know," she said.

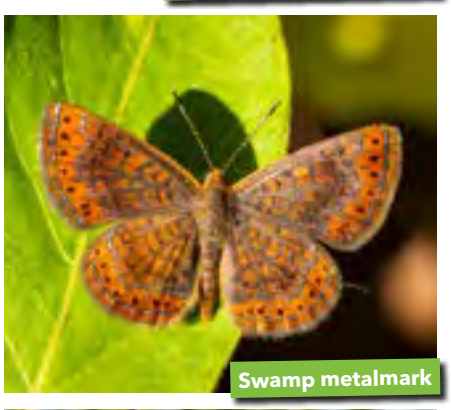
Other species that depend on fens are grey petaltail dragonflies and butterfly species like swamp metalmarks and monarchs. Birds like yellow-breasted chats, common yellowthroats, Kentucky warblers, and Lincoln's sparrows thrive there, too. Fens are also great places to see more common species like ninebark, golden ragwort, swamp wood betony, and Indian paintbrush.

"Fens comprise a very small part of the landscape but are extremely species-rich and are habitat for a disproportionate number of rare species," explained Farrington.

Small white lady's slipper

Grass pink orchid

Hine's emerald dragonfly



Swamp metalmark

Yellow-breasted chat

Johnson's Shut-Ins fen

Fen Restoration? Hope Springs Eternal

There still may be some rare plants hanging on in Missouri's fens that could be restored, given a chance. Nelson feels conservationists could restore wetlands in places where they didn't even think they existed.

"We have put so much wetland conservation in our biggest river systems," he said. "That's where we have our biggest wetlands and our biggest bang for the buck. But we've overlooked the Ozarks in the past. And they have quite a lot of wetlands. They're just smaller."

Since they are driven by groundwater, restoring them is going to take a different set of tools. Building levees and installing pump systems won't do much good but restoring the hydrology that has been diverted and lowered might. In small valleys near headwaters, nurturing beaver habitat might be one option to consider.

Sixty million beavers once lived throughout most of North America prior to European exploration. By 1900, most beavers were extirpated throughout much of their former range.

If beavers once kept the groundwater levels higher across these watersheds, there may have been a much wider distribution of fen-loving plants, Nelson theorizes. But when humans trapped the beavers and altered the hydrology, these widespread conditions for fen plants shrunk to smaller islands where groundwater drainage remains today.

"How long have these pockets of plants been isolated from each other?" he asked. "I'd like to do genetic analysis, and we could do the same with critters."

He's excited by the prospect of what might take place, once the hydrology is restored.

"You may not be able to hunt ducks over a restored fen, but there's going to be these unique plants, insects, and critters that are going to increase the overall biodiversity," he said.

And since fens serve as natural filters, conserving them helps protect the water quality of our Ozark streams.

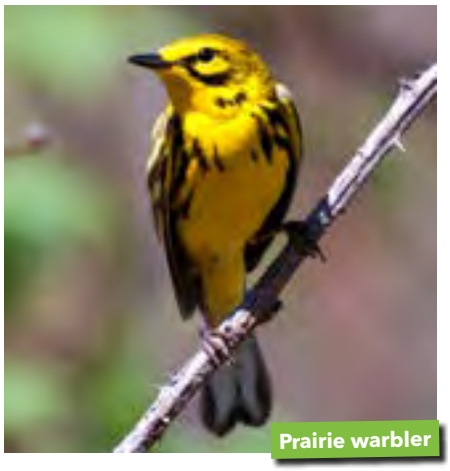
Beaver dam

Goodness Gracious, Glades!

If a permanent trickle of water is spilling from a rocky outcropping or bluff, it's possible for small fenlets to form on glades. These microecosystems are fragile. Eastern red cedars can easily encroach if the area isn't managed correctly. When that happens, the glade — which is already normally dry — can grow even drier since cedars are proficient at evapotranspiration. The fenlet can dry up.

Glades typically are not big; a 5-acre glade is considered large in the Ozarks. (Although the White River Hills Subsection has some expansive glades that exceed 100 acres.) But they are spectacular harbors for biodiversity.

"Glades and fens have a high number of species compared to the best woodlands," Farrington said.


Prairie warbler

One such example is the prairie warbler, a bird in steep decline around the country. Belying their name, these warblers don't typically live on prairies; they prefer shrubby dry glades and old fields. These warblers also do well in forest clear-cuts, but that habitat is temporary since clear-cuts regrow quickly. Glades, because of their permanence, are perfect for these lively yellow songbirds.

Glades are categorized by the type of bedrock they developed on. Dolomite is the most common form of bedrock within Missouri's glade communities, followed by igneous, limestone, and sandstone. Chert glades are extremely rare.

Glades can be tortuous, bone dry, mini-deserts, but those are the conditions that allow species normally associated with the American Southwest — such as a prickly pear cactus, greater roadrunner, or a striped scorpion — to exist in Missouri.

Missouri sits at the intersection of many different habitat types.

"It's why we have a fair bit of biodiversity," Farrington said.

Helping Missouri's Fens and Glades

Managing fens and glades can be challenging, but not impossible. Both benefit from eastern red cedar removal and prescribed burning.

A glade with cedar encroachment is prone to fuel overload. Cedars are resistant to decay; that's one of the reasons they're a valuable wood product. They rarely die unless they are cut down or every single needle is burnt off. And, when burned, the intensive heat can kill overstory trees like chinkapin oaks. Cut cedar logs persist for decades, although they do rot more quickly near the ground. They're difficult to drag off glades. Farrington said MDC staff and volunteers try to build and burn the cedars in smaller bonfires on calm, wet, winter days.

"It's labor-intensive," she lamented.

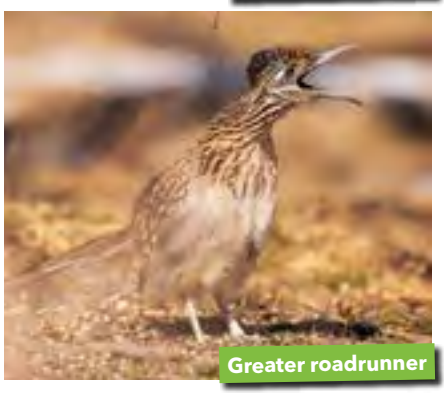
Like glades, fens also can benefit from having other woody shrubs and trees removed.

A quality burn on a glade acts like fertilizer. In the year following the blaze, an abundance of flowers bloom into life. However, it can be difficult to manage a fen safely with fire, since fens stay wet and often won't burn under the milder conditions favored for prescribed burns.

Landowners interested in conserving the fens and glades on their properties are invited to reach out to MDC's Community and Private Lands Conservation Branch staff. You can learn more here at **mdc.mo.gov/your-property**. ▲

Kristie Hilgedick serves as the MDC ombudsman, responding to public questions submitted to Ask MDC *and writing the* Ask MDC *column in* Missouri Conservationist.


Prickly pear cactus


Greater roadrunner


Striped scorpion

JOHNSON'S SHUT-INS FEN, BEAVER DAM, PRICKLY PEAR CACTUS, STRIPED SCORPION: JIM RATHERT; PRAIRIE WARBLER: © JASON ONDRECKA | DREAMSTIME.COM; GREATER ROADRUNNER: NOPPADOL PAOTHONG; PRESCRIBED BURN: PAUL CHILDRESS

Get Outside in APRIL

Ways to connect with nature

Eastern phoebe

Blooms, Butterflies, and Birds

Viewing Violets

Did you know Missouri has 17 species of violets? And April is their month! It's a great time to get outside and see how many you can find. Here's a hint for identifying the different species: Look at their leaves and not just their flowers. To make your violet viewing easier, MDC's online *Field Guide* has a page dedicated just to violets (**short.mdc.mo.gov/owW**). So, grab a phone or a camera, snap a picture of what you see on your walk, and then come home and use the guide for a positive ID.

Bird's-foot violet

A Bevy of Butterflies

A sure sign of spring is the return of delicate-winged butterflies as they flitter about from flower to flower. Missouri is home to a wide variety of butterflies. Here are a few to look for:

- **Falcate orangetips** fly low to the ground for only a few weeks in April and May. They are one of our earliest butterflies to emerge.
- **Henry's elfin** and **spring azure** butterflies are especially fond of wild plum blossoms, and their emergence is timed to coincide with the springtime blooming period of wild plum.
- **Pine elfin** butterflies are especially fond of visiting pussytoes' flowers for nectar, so their emergence is timed to coincide with the springtime flowering of this native wildflower. Since their larval food plant is our native shortleaf pine, you will find adult pine elfins fluttering around in areas that have both pine trees and blooming pussytoes.

Spring azure with wild plum blooms

Busy Birds

Many birds are busy singing, mating, and building nests this time of year. It's a great time to get out and observe this activity. Here's a few to get you started:

- **Eastern phoebes** build mud and plant nests under eaves of homes. Listen for their hoarse, insistent calls — *FEE-bee! FEE-bee!*
- **Cliff swallows'** clusters of juglike mud nests are attached to overpasses, bridges, culverts, barns, and cliffs. In spring, people sometimes see these birds gathered around rural mud puddles, where they roll little bits of mud into a ball and fly off, carrying it in their mouth to the nearby nest they are constructing. Their sounds include harsh chattering and softer *churr* and *heew* calls.
- **Northern cardinals** build nests with stems, twigs, bark, grass, and paper, lined with fine grass and hair. Both males and females sing in clear, up- or down-slurred whistles. The different songs have been described as *what cheer, what cheer, what cheer, wheet, wheet, wheet,* and *purdy-purdy-purdy-purdy*. Their call is a sharp *chip*.

Natural Events to See This Month

Here's what's going on in the natural world.

Eastern leather-wood blooms.

Female crayfish carry eggs under their abdomen.

White and black crappie spawn.

Find more events in your area at **mdc.mo.gov/events**

Wildin' Out for Wildflowers

If your interest in flowers goes well beyond our native violets, Missouri's outdoors has you covered. April is also an excellent month for viewing and learning about all kinds of native wildflowers. These flowers not only beautify the landscape, but they are an important food source for pollinators, birds, and insects. And the best part is they can be found just about anywhere, from roadsides and stream banks to prairies and in forested areas. MDC's online *Field Guide* has a page dedicated to native wildflowers to help you identify your blooms (**short.mdc.mo.gov/4fb**) guide for a positive ID.

VIRTUAL

Turkey Hunting: After Your Harvest

Thursday • April 9 • 5:30–6:30 p.m.
Online only
Registration required by April 9. For more information, call 888-283-0364 or visit short.mdc.mo.gov/owe.
All ages

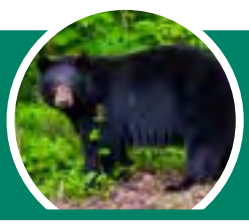
Spring is a great time to get outdoors and pursue Missouri's largest gamebird, the wild turkey. If you harvest a turkey this spring; mounting the fan is a great way to create a decorative keepsake that will last for years to come. Join us to learn how to preserve and display it. This virtual program will show you the supplies you will need and take you step-by-step through the process.

Missouri Birds and Habitats

Thursday • April 16 • 6–7 p.m.
Online only
Registration required by April 16. For more information, call 888-283-0364 or visit short.mdc.mo.gov/owh.
All ages

New to birding or need a refresher? Join Missouri State Ornithologist Kristen Heath-Acre for a primer on identification of Missouri's common birds by sight, sound, and their associated habitats. Whether new to birding or experienced, there are always tips and tricks to learn in the world of birds.

Northern spiny softshells breed.



Black bears are active again.

Places to Go

CENTRAL REGION

Painted Rock Conservation Area

The outdoors for all

by Larry Archer

Once a retreat for the wealthy and influential of Missouri's capital, Painted Rock Conservation Area (CA) now offers outdoor adventure to all Missourians.

Located on nearly 1,500 acres in Osage County, Painted Rock CA hosted elected and appointed government officials, doctors, attorneys, and business leaders during the late-19th and early 20th centuries, according to MDC Forester Aaron Holsapple.

"Back in the pre-Depression Era, and even before the Conservation Commission was created, it was known as a country club for dignitaries from Jefferson City," Holsapple said. "They would take their families, and they would stay for the weekend. They would hunt and fish and just have a good time over there."

That good time can now be had by all. Painted Rock CA's 1.6-mile loop trail offers hikers expansive views of the Osage River valley, including both easy and challenging options, he said.

"It's a strenuous hike if you take the entire loop, but the nice thing about it, if you just go straight out to the overlook and come straight back, it's flat, so just about anybody could do that," he said.

The area's 5-acre lake and access to the Osage River also make it a family fishing destination, he said.

Painted Rock CA's name is derived from the Native American pictographs found on the area. The pictographs are estimated to be 700–800 years old, but artifacts from the site place the earliest Native American presence at more than 2,500 years ago.

NOPPADOL PAOTHONG

Moss covers limestone rocks on a bluff overlooking the Osage River at Painted Rock Conservation Area, highlighting its rugged Ozark landscape. In April, visitors are likely to see the first signs of mayapples (inset).

PAINTED ROCK CONSERVATION AREA

consists of 1,479.5 acres in Osage County. From Westphalia, take Highway 63 north, then Highway 133 west 7 miles to the area.

38.4108, -92.0989

short.mdc.mo.gov/4k2 573-815-790

WHAT TO DO WHEN YOU VISIT

Bicycling Includes 3.7 miles of service and unimproved roads open to bicycling year-round.

Birdwatching Included in the Missouri Birding Trail (**short.mdc.mo.gov/oZH**). The eBird list of birds recorded at Painted Rock CA is available at **short.mdc.mo.gov/owG**.

Camping Includes eight individual campsites. No amenities provided.

Fishing Includes 5-acre Clubhouse Lake. Black bass, largemouth bass, bluegill, catfish, sunfish. Also access to 2.5 miles of Osage River frontage.

Hiking Osage Bluff Scenic Trail, 1.6 miles with one 40-foot bridge, two boardwalk overlooks, and three benches.

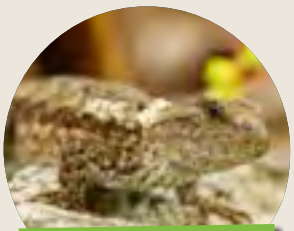
Hunting **Deer** and **turkey**. Regulations are subject to annual changes. Refer to MDC's regulation page online at **short.mdc.mo.gov/Zjw.** Also **squirrel**.

Trapping Special use permit required.

WHAT TO LOOK FOR WHEN YOU VISIT

Coyote

Raccoon



Prairie lizard

American woodcock

Wild Guide

White Bass

Morone chrysops

Status
Native game and sport fish

Size
Total length: 9–15 inches; weight: ¼ to 1¼ pounds

Distribution
Mississippi River and its tributaries, most large Ozark reservoirs, Missouri River and its tributaries

White bass are a silvery, spiny-rayed, elongated fish with several dark horizontal streaks along the sides. They inhabit the deeper pools of streams and the open waters of lakes and reservoirs. They avoid waters that are continuously turbid and are most often found over a firm sandy or rocky bottom. They are most active at dawn and dusk when they feed on fish, small crustaceans, and aquatic insects.

LIFE CYCLE

White bass are early spring spawners. Males enter tributaries in March and remain until the middle or latter part of April. They become mature and move to spawning grounds about a month before the females. Spawning occurs in midwater or near the surface, over a gravelly or rocky bottom, often in a current, and without preparation of a nest. After fertilization, the eggs settle to the bottom, where they become attached to rocks and hatch in about two days. A single large female may produce nearly a million eggs in one spawning season. Spawning is completed over a period of five to 10 days. White bass grow rapidly, and individuals can live about 4 years.

HUMAN CONNECTIONS

White bass are one of Missouri's most important sport fishes in large impoundments. During years of peak abundance, white bass make up 40 percent or more of the fish harvested in some Ozark reservoirs.

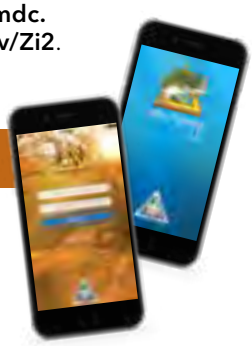
JIM RATHERT, LANCE MERRY

Outdoor Calendar

MISSOURI DEPARTMENT OF CONSERVATION

Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to view permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you view permits, find great places to fish, and ID your catch. Get both in Android or iPhone platforms at **short.mdc.mo.gov/Zi2**.



FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:

- Catch-and-Release:
  March 1–May 22, 2026
- Catch-and-Keep:
  May 23, 2026–Feb. 28, 2027

Bullfrog, Green Frog

June 30 at sunset–Oct. 31, 2026

Nongame Fish Gigging

Impounded waters, sunrise to sunset:
Feb. 16–Sept. 14, 2026

Paddlefish

Statewide:
March 15–April 30, 2026

On the Mississippi River:
March 15–May 15, 2026
Sept. 15–Dec. 15, 2026

Trout Parks

State trout parks are open seven days a week Mar. 1 through Oct. 31.

Catch-and-Keep:
March 1–Oct. 31, 2026

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at **short.mdc.mo.gov/Zib**. Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at **short.mdc.mo.gov/ZZf**.

HUNTING

Bullfrog, Green Frog

June 30 at sunset–Oct. 31, 2026

Coyote

Restrictions apply during April, spring turkey season, and firearms deer season.

Open all year

Deer

Archery:
Sept. 15–Nov. 13, 2026
Nov. 25, 2026–Jan. 15, 2027

Firearms:

- Early Antlerless Portion (open areas only):
  Oct. 9–11, 2026
- Early Youth Portion (ages 6–15):
  Oct. 24–25, 2026
- November Portion:
  Nov. 14–24, 2026
- Late Youth Portion (ages 6–15):
  Nov. 27–29, 2026
- Late Antlerless Portion (open areas only):
  Dec. 5–13, 2026
- Alternative Methods Portion:
  Dec. 26, 2026–Jan. 5, 2027

Groundhog (Woodchuck)

May 11–Dec. 15, 2026

Pheasant

Youth (ages 6–15):
Oct. 24–25, 2026

Regular:
Nov. 1, 2026–Jan. 15, 2027

Quail

Youth (ages 6–15):
Oct. 24–25, 2026

Regular:
Nov. 1, 2026–Jan. 15, 2027

Rabbits

Oct. 1, 2026–Feb. 15, 2027

Squirrels

May 23, 2026–Feb. 15, 2027

Turkey

Spring:

- Youth (ages 6–15):
  April 11–12, 2026
- Spring:
  April 20–May 10, 2026

Fall:

- Archery Portion:
  Sept. 15–Nov. 13, 2026
  Nov. 25, 2026–Jan. 15, 2027
- Firearms Portion:
  Oct. 1–31, 2026

Waterfowl

See the Migratory Bird and Waterfowl Hunting Digest *or visit short.mdc.mo.gov/ZZx for more information.*

TRAPPING

Special Trapping Season for Private Lands Only: Coyote, Opossum, Raccoon, Striped Skunk

March 1–April 14, 2026

ILLUSTRATION: MARK RAITHEL

Serving nature and you®

Follow us on Instagram
@moconservation

In searching for nectar, regal fritillary butterflies will visit a variety of native wildflowers, including common milkweed, coneflowers, blazing stars, and goldenrods. Spring is a great time to see these flowers in bloom. Get out and see how many you can find. What will you discover?

by **Noppadol Paothong**

Free to Missouri households

To subscribe, cancel your subscription, or update your address, visit **mdc.mo.gov/conmag**.