

MISSOURI CONSERVATIONIST

VOLUME 87, ISSUE 10, OCTOBER 2026
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ON THE COVER

A northern bobwhite watches for danger at Hi Lonesome Prairie Conservation Area.

NOPPADOL PAOTHONG
500mm lens, f/8, 1/320 sec, ISO 400

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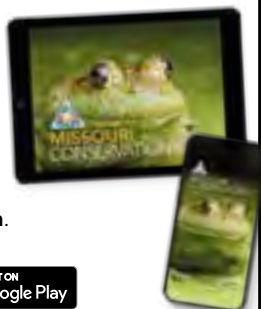
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Inbox



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2



3



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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. *Missouri Conservationist* does not accept AI-generated photos.

- 1 | Lion's mane mushroom by **William Allen**, via Flickr
- 2 | Raccoon at Mingo National Wildlife Refuge by **Diedre Peters**, via website submission

- 3 | White-tailed deer by **Jeff Johnson**, via Flickr
- 4 | Three-toed box turtle by **Zachary Snyman**, via email submission

➔ 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

NATURE LAB AT WORK

As with all your issues for the past 50-plus years, I look forward to each month, anxious to see what you will treat us with next, and I'm always pleased. I particularly enjoyed *Nature Lab at Work* [Page 4] in the August 2026 issue. It provided valuable insight into the efforts of MDC staff to help us work together with our wildlife. Additionally, as a retired teacher, I appreciate the notation of Mr. DeBold's education. It gives us a glimpse of his path to achieve his current assignment within MDC and provides focus for those aspiring to someday work in the nature management industry. Well done!

Nick Thiele Leopold

N-O TO AI

I saw the Editors' Note in the August 2026 magazine about AI use [Page 3]. Well stated! Thank you so much for not using AI. It's a breath of fresh air, so to speak, when so many organizations are choosing to use it.

Todd F. Joplin

FREE TO MISSOURI RESIDENTS

We have been receiving your magazine regularly since 1999, and we have never been disappointed. It's ironic how many free things are better than many things that you pay for. Thank you!

Mark Forster via email

Subscriptions to the *Missouri Conservationist* are free to Missouri residents (limit one per household). Get yours by visiting mdc.mo.gov/conmag, emailing subscriptions@mdc.mo.gov, or calling 573-522-4115, ext. 3856.
— The Editors

DAVID STONNER

Up Front



✱ You've come to know how much I like sharing connections made with a special place and how those connections can help in the development of future passions. For me, one of those places is Prairie Fork Conservation Area (CA). In this month's issue, we highlight Prairie Fork CA in *Places to Go* (Page 30). As an undergraduate

at the University of Missouri, I spent a summer there surveying small mammals, monitoring bird populations, and conducting vegetation sampling. It was the early days of restoring the area, which was once a working cattle farm.

Through the generous contributions of Pat and Ted Jones, Prairie Fork has become not only important for wildlife, but also a place for research and education for future generations. I was fortunate to have a few conversations with Pat while she was still living on the property. Her passion for conservation, education, and leaving the world a better place

was incredibly inspiring.

Prior to leaving for graduate school, I tracked quail at Prairie Fork and nearby Reform CA. I was able to return to Prairie Fork nearly two decades later to witness the tremendous transformation of the area.

While people and places are important, sounds can also create those connections. The call of a northern bobwhite is one of the most recognizable sounds outdoors. The article, *What's That Sound?* (Page 22), details the hard work necessary to restore habitat that supports this iconic species.

The sights, sounds, and smells all contribute to the connections we make with the places we visit in nature. So, the next time you venture outdoors, take the time to let your senses run wild and take it all in. You never know what will spark that connection.

JASON SUMNERS, DIRECTOR

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Missouri Conservation Commissioners

Have a Question for a Commissioner?

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



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Margaret F. ECKELKAMP

WILDLIFE HEALTH

Canine Distemper Virus

Scientists monitor and track distemper in Missouri's wild carnivores

by Dianne Van Dien

✳️ A raccoon saunters across your yard on a sunny afternoon. Its movements seem slow, uncoordinated. It looks disheveled. You stomp your feet and yell, but it doesn't react. You wonder, does this animal have rabies?

While rabies is certainly a possibility, in Missouri there's a good chance that this raccoon has another disease — canine distemper virus.

"A lot of people see an animal with these symptoms and think it's rabies because the symptoms are so similar," said MDC Wildlife Health Specialist Samantha Maywald.

Both rabies and distemper can cause animals to be weak, lethargic, disoriented, and lose their fear of humans. Animals with rabies may drool and become aggressive. Animals with distemper may have difficulty breathing, mucus around their eyes, and thickened skin on their nose and pads of their feet. For your safety, never approach an animal to check for specific symptoms. Instead, contact your



A raccoon showing signs of canine distemper virus. The disease often causes symptoms similar to rabies, making laboratory testing important for an accurate diagnosis.

local MDC office or conservation agent so trained staff can safely handle the situation.

Because canine distemper and rabies can appear so similar in the field, MDC sends samples from sick wildlife for diagnostic testing at the University of Georgia. MDC also receives tissue samples from the Missouri Department of Health and Senior Services from wildlife that tested negative for rabies. Many of those animals, particularly raccoons, ultimately test positive for canine distemper.

"Every sample submitted provides valuable information about the health of Missouri's wildlife," said MDC Conservation Health Section Chief Deb Hudman. "By tracking where disease occurs, which species are affected, and how cases change over time, MDC biologists can identify disease trends, monitor wildlife health, and improve management decisions."

Canine distemper virus is transferred through bodily fluids, including droplets in air exhaled from the lungs, so it can easily spread among social animals like raccoons. But foxes, coyotes, bobcats, skunks, and members of the weasel family can also get distemper. The disease is often fatal.

"Canine distemper won't affect people, but it can affect pets," Maywald said. "This is why it's important to get your pets vaccinated for distemper as well as for rabies."

At a Glance

Canine distemper virus is one of several wildlife diseases that MDC monitors. Raccoons are the most commonly affected species, but foxes, coyotes, skunks, bobcats, and members of the weasel family can also contract it. People cannot get distemper, but unvaccinated dogs and other susceptible pets can.

HOW YOU CAN HELP:

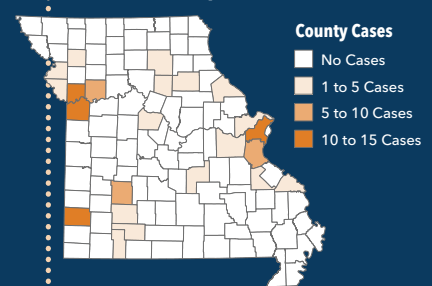
- Keep pet vaccinations up to date.
- Keep pets away from sick or dead animals.
- Do not touch or try to rescue sick wildlife.
- Do not feed wildlife, which can cause animals to congregate and spread disease.
- Report wildlife with signs of illness to MDC.

TO REPORT A SICK OR DEAD ANIMAL:

Call your local conservation agent or MDC office, or report online at short.mdc.mo.gov/4KD.

PARTNERS: Southeast Cooperative Wildlife Disease Study at the University of Georgia, Missouri Department of Health and Human Services

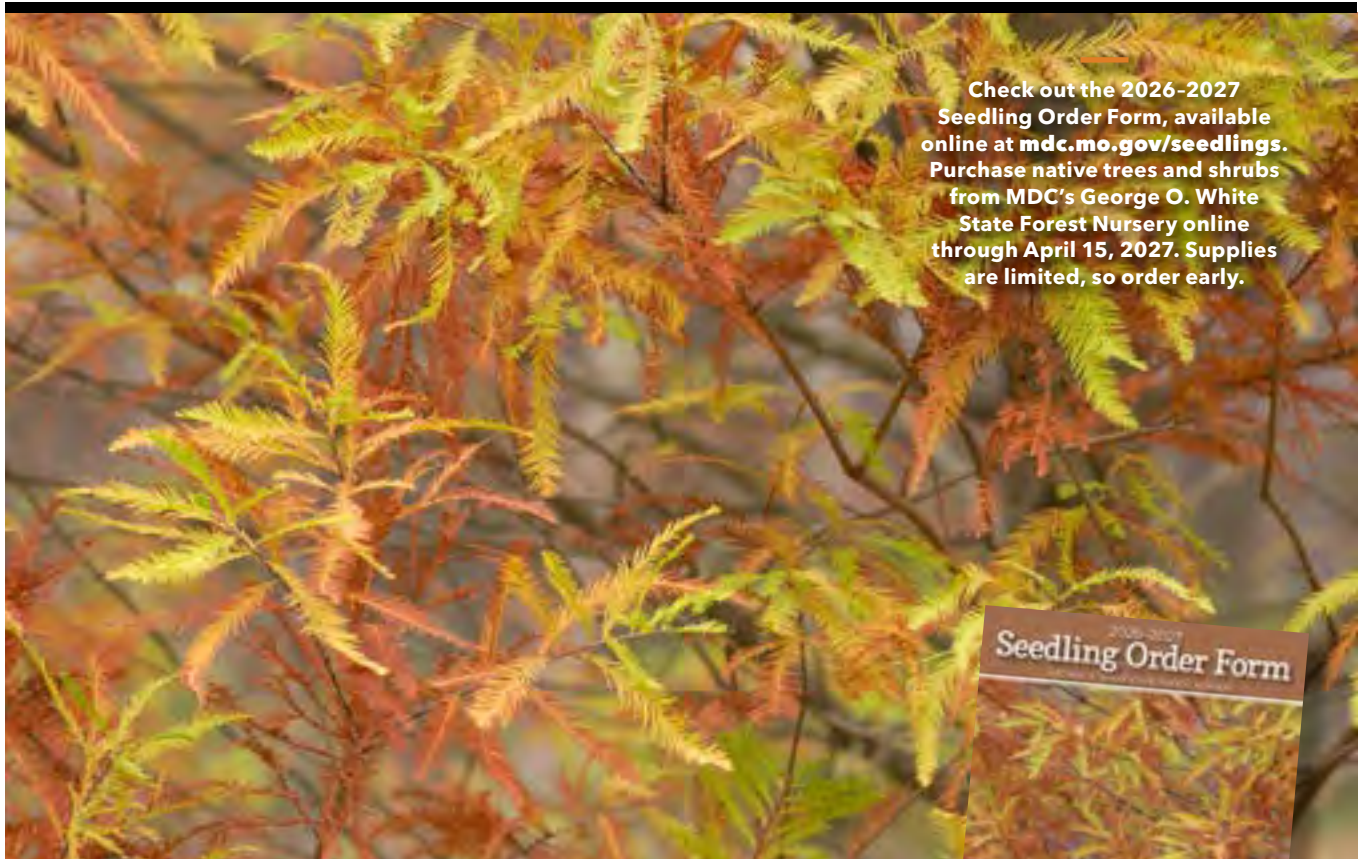
Canine Distemper Cases in 2025



In 2025, 135 samples tested positive for canine distemper.

In Brief

News and updates from MDC



Check out the 2026-2027 Seedling Order Form, available online at mdc.mo.gov/seedlings. Purchase native trees and shrubs from MDC's George O. White State Forest Nursery online through April 15, 2027. Supplies are limited, so order early.

GO NATIVE

BUY NATIVE TREE AND SHRUB SEEDLINGS FROM MDC'S GEORGE O. WHITE STATE FOREST NURSERY

➔ Need trees and shrubs for your landscape? Go native with tree and shrub seedlings from MDC's George O. White State Forest Nursery. Native trees and shrubs can help improve wildlife habitat and soil and water conservation while also improving the appearance and value of private property.

The state nursery offers a variety of low-cost native tree and shrub seedlings for sale for reforestation, windbreaks, erosion control, wildlife food and cover, and other purposes.

The nursery provides mainly 1-year-old bare-root seedlings with sizes that vary by species. Seedling varieties include pine, bald cypress, cottonwood, black walnut, hickory, oak, river birch, maple, willow, sycamore, blackberry, buttonbush, redbud, elderberry, sumac, wild plum, witch hazel, and many more. MDC recommends ordering early for the best selection.

Seedlings are available in bundles of 10 or increments of 25 per species. Prices range from 44 cents to \$2.57 per seedling. Sales tax will be added to orders unless tax exempt. There is a shipping fee and a \$9 handling charge for each order. Receive a 15 percent discount up to \$20 off seedling orders with a Conservation ID Number. Orders will be shipped or can be picked up at the nursery, located near Licking, from mid-February through mid-May.

For a copy of the 2026-2027 Seedling Order Form, visit mdc.mo.gov/seedlings or contact the nursery at 573-674-3229. Seedling orders can be placed online through April 15, 2027.

POOSEY CONSERVATION AREA'S FALL DRIVING TOUR CELEBRATES 40 YEARS

Each year, Poosey Conservation Area (CA) in northwest Livingston County draws hundreds of families and groups in October for its fall driving tour. All ages come to the area by car, truck, bicycle, horseback, and in horse-drawn buggies to enjoy the fall color along the winding gravel service roads that are usually closed to the public.

This year's driving tour — on Sunday, Oct. 18 from noon to 4 p.m. — is extra special. It marks the 40th anniversary of this annual fall event.

Staff will provide tour brochures at the route entrance to help visitors find interpretive stops along the driving route that showcase conservation practices, such as timber stand improvement and native warm-season grasslands.

Visitors will find exhibits on nature, conservation, and Poosey area history along the tour route and can visit with MDC staff about conservation issues.



For more information on fall color, see *Get Outside* Page 28 or visit short.mdc.mo.gov/ZVf.

MDC invites visitors to its annual fall driving tour at Poosey Conservation Area on Oct. 18 from noon until 4 p.m. Enjoy fall color by car, truck, ATV, horseback, wagon, and other modes of transportation. Visitors will also find exhibits on nature, conservation, and more.

The tour route begins at Pike's Lake and includes a few steep grades in places, along with a few creek crossings. A vehicle (or other mode of transport) with high clearance is recommended. Visitors can expect a slow driving pace.

For more information, contact MDC's Chillicothe Office at 660-646-6122. Find maps and more information about Poosey CA at short.mdc.mo.gov/ZFd.

Ask MDC

Got a Question for Ask MDC?

Visit mdc.mo.gov/contact-us

Q: Can you help identify this bird? It was in a field outside of Advance, Mo.

➔ This is an adult American golden plover (*Pluvialis dominica*) probably molting out of its breeding plumage. These early migrants are notable for the flecks of black, white, and shimmering gold on their upperparts and the white stripes that extend from their foreheads and eyebrows. Their smaller bills help differentiate them from black-bellied plovers.

They are known to migrate south by mid-July — or earlier — but they don't reach peak fall migration until October. They breed in the northernmost reaches of the North American continent and overwinter as far south as Argentina, which means they have long migration routes and can fly fast.

The American golden plover, like so many of its shorebird relatives, is in steep decline. Its numbers have fallen by half over the last half-century.

In Missouri, look for them in the fall and spring on plowed fields, flooded row-crop stubble, prairies, grazed pastures, and muddy shorelines where they search for worms, insects, and other invertebrates. According to the Cornell Lab of Ornithology's *All About Birds* website, they hunt much like an American robin,

running along, stopping to scan for prey, then quickly picking it up from the ground.



American golden plover

AMERICAN GOLDEN PLOVER: MARIA MOORE; BRYOZOAN: DAVID CARPENTER; EASTERN COPPERHEAD: ANDY GUDERMUTH



Bryozoan



Eastern copperhead

Q: This gelatinous mass was on a submerged branch at the Lake of the Ozarks. What is it?

➔ This is a bryozoan colony. Bryozoans are microscopic, aquatic, filter-feeding invertebrates that create colonies that can be mossy, branching, or round and jellylike. The colonies of different bryozoan species take different forms, building exoskeletons, or outer protective structures, like those of corals. Most colonies are attached to a structure such as a rock or submerged branch.

The species that creates the round, jellylike masses most often seen in Missouri is *Pectinatella magnifica*. Colonies are usually no more than 2 to 4 inches long or high, but some can be 12 inches or wider. Viewing individual zooids — a tiny bryozoan — requires a hand lens. Each zooid has mucous-coated tentacles that trap diatoms and other microscopic organisms that are swept to the mouth via cilia, or tiny hairs, that line the tentacles. Fish, insects, and snails graze on them.

Like mussels and other filter feeders, bryozoans gradually cleanse the water as they feed. Also, their presence usually indicates good water quality.

Q: Where do eastern copperheads prefer to spend the winter months?

➔ Most eastern copperheads (*Agkistrodon contortrix*) enter overwintering sites from mid- to late October in Missouri. Individuals overwinter singly or congregate at favorite overwintering sites, which are typically south-facing, rocky ledges. They also use abandoned rock quarries,

rocky lake spillways, animal burrows, hollow logs, stumps, and caves.

They eat a wide variety of prey, but mice and voles make up the bulk of their diet. They also will eat frogs, lizards, small birds, insects (especially cicadas), and occasionally other small snakes.

Young eastern copperheads and some adults have yellow tail tips, and some young copperheads use these yellow tails as lures to attract small frogs or lizards.

What IS it?

Can you guess this month's natural wonder?

The answer is on Page 8.



INVASIVE SPECIES

MISSOURI'S LEAST WANTED

Invasive nonnative species destroy habitat and compete with native plants and animals. Please do what you can to control invasive species when you landscape, farm, hunt, fish, camp, or explore nature.

Japanese Knotweed

by Angela Sokolowski

Japanese knotweed (*Fallopia japonica*) is an invasive perennial that spreads aggressively through rootlike rhizomes, allowing even small root fragments to produce new colonies. Plants have tall, hollow stems with reddish speckles, broad heart- to triangular-shaped leaves, and clusters of creamy-white flowers in late summer. Dead canes often remain standing throughout winter.

Why It's Bad

Japanese knotweed forms dense, bamboolike thickets along streambanks, roadsides, and other disturbed areas, which displaces native vegetation, reduces wildlife habitat, and destabilizes streambanks. Its extensive root system can also damage pavement, foundations, and other infrastructure.

How to Control It

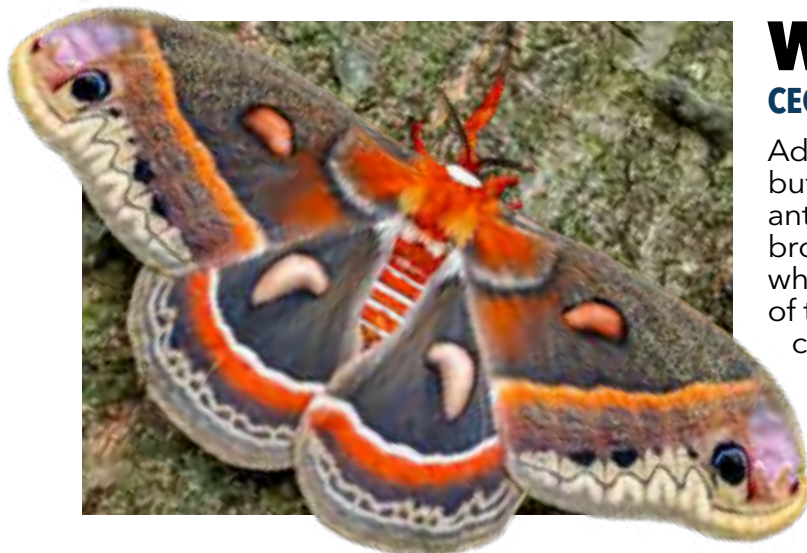
Persistence is essential. Single treatments rarely eliminate established infestations.

Mechanical: Repeated cutting or mowing can weaken plants over time but is generally ineffective unless done frequently and combined with other control methods. Bag all cuttings and dispose in landfill or burn.

Chemical: Herbicide applications in late summer or early fall provide the most reliable control. Apply 8 percent glyphosate or 1.5–2 percent triclopyr product to foliage. Use only aquatically approved products on plants growing near water. Always read and follow the herbicide label.



To learn more, visit short.mdc.mo.gov/opt



WHAT IS IT?

CECROPIA MOTH

Adult cecropia moths are butterflylike but have stout, hairy bodies and feathery antennae. Seen from above, they are dark brown or gray overall, with red-rimmed, white crescent shapes at the center of each of their four wings. This nocturnal species, considered the largest moth native to

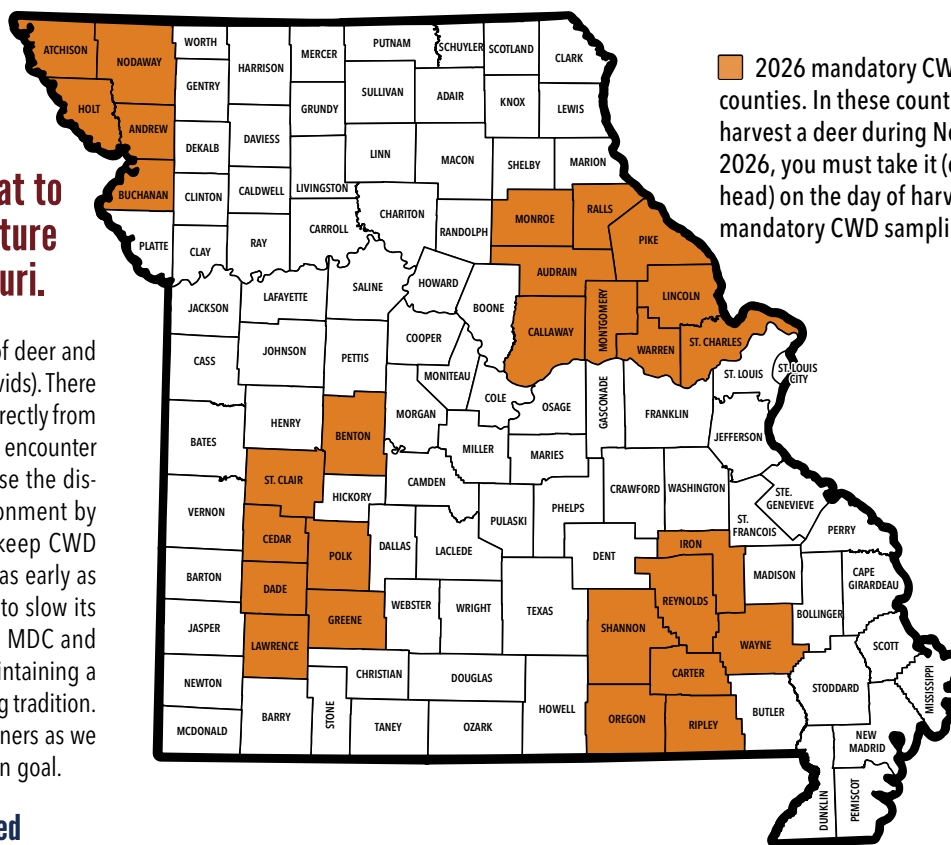
North America, can be found statewide.

As caterpillars, they feed on more than 20 species of Missouri trees and shrubs, sustaining them through their adulthood, which lasts about two weeks.

Info to Know for the 2026-2027 Deer Season



2026 mandatory CWD sampling counties. In these counties, if you harvest a deer during Nov. 14-15, 2026, you must take it (or the head) on the day of harvest to a mandatory CWD sampling station.



MDC has removed the designation of the CWD Management Zone. Most Missouri counties either have had a case of CWD or are within 10 miles of a confirmed case of the disease, so a designated CWD Management Zone is no longer needed. Removing the CWD Management Zone also helps simplify regulations for hunters.

MDC has moved mandatory CWD sampling during the opening weekend of the November Portion of firearms deer season to a four-year county rotation. Mandatory CWD sampling will now be conducted in every county of the state once every four years. Hunters who harvest a deer in designated counties during Nov. 14-15 must take their deer, or the head, on the day of harvest to one of MDC's mandatory CWD sampling stations. Sampling and test results are free. Find sampling locations online at mdc.mo.gov/cwd or from MDC's *2026 Fall Deer & Turkey Hunting Regulations and Information* booklet at short.mdc.mo.gov/ZXv.

MDC will again offer statewide voluntary CWD testing of harvested deer free of charge during the entire deer season at select locations throughout the state. Find locations and more information online at mdc.mo.gov/cwd or by contacting an MDC regional office.

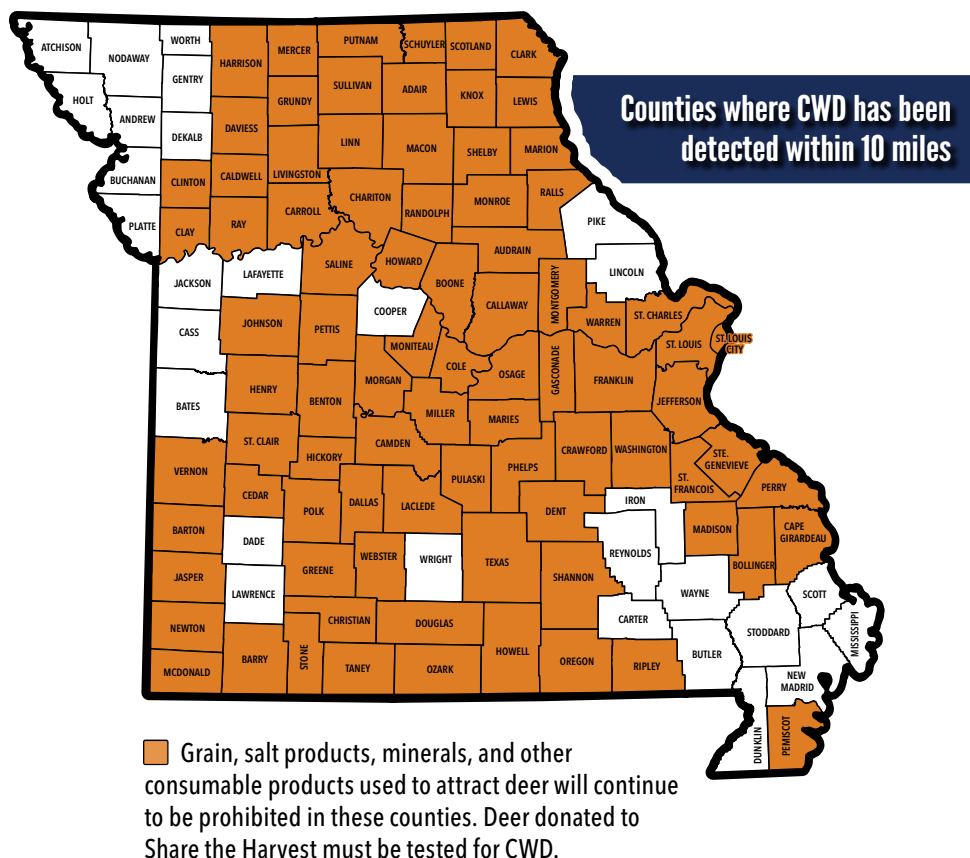
Test results for CWD-sampled deer are free and will be available within four weeks after the sampling date. Get test results online at [**mdc.mo.gov/CWDTestResults**](https://mdc.mo.gov/CWDTestResults).

Placing feed and minerals for deer artificially congregates them, resulting in an increased risk of disease transmission. It has been prohibited in counties close to where CWD has been detected since CWD was first found in Missouri. Grain, salt products, minerals, and other

consumable products used to attract deer will continue to be prohibited in counties within 10 miles of where CWD has been found, which, this year, now includes Benton, Johnson, and Pettis counties (see map on next page). For exceptions, see the *2026 Fall Deer & Turkey Hunting Regulations and Information* booklet.

MDC has removed the antler-point restriction (APR) for the final 18 counties where it was most recently in place. Yearling bucks, which the APR protects, travel many miles and can spread CWD long distances. Removing the APR will help to minimize the spread of CWD while also simplifying regulations.

MDC has removed the CWD Portion of firearms deer season. Removing the CWD Portion will simplify the structure of deer season for hunters and not significantly affect deer harvest.



Share the Harvest

Missouri's Share the Harvest program helps deer hunters donate venison to those in need. To participate, take harvested and field-dressed deer to an approved drop-off location or Share the Harvest meat processor and let the processor know how much venison is to be donated. If you are donating a deer to Share the Harvest, it must be tested for CWD if it was harvested in a county that is within 10 miles of where CWD has been detected (see map) to align with the Centers for Disease Control and Prevention's recommendations. Deer donated to a processor participating in the Share the Harvest CWD Testing Program will be sampled upon donation. For a list of drop-off locations and Share the Harvest processors, visit mdc.mo.gov/share.

No Targeted Removals

As a result of public engagement and continued evaluation, MDC will not conduct targeted deer removals after the season and currently has no plans to resume the activity. Instead, MDC staff will work with hunters, landowners, and other partners to develop a localized approach in which hunter harvest is the primary tool to manage deer numbers and CWD during the regular deer season.

What You Can Do to Help

Join MDC to protect Missouri's deer herd! Hunter, landowner, and partner involvement is critical to managing CWD and protecting Missouri's deer herd and hunting culture.

- Harvest additional deer if you hunt in an area near where CWD has been found.
- Have your deer tested for CWD.
- Follow the carcass disposal regulations (statewide) and the prohibition of placing feed and minerals for deer (counties within 10 miles of where CWD has been found).
- Educate yourself and others about CWD and the importance of CWD management.

For more information

Get more information on CWD regulations and other CWD information online at mdc.mo.gov/cwd or from MDC's 2026 Fall Deer & Turkey Hunting Regulations and Information booklet, available where permits are sold and online at short.mdc.mo.gov/ZXv.



Carcass Disposal Restrictions

- Parts of a deer carcass that are not kept or provided to a taxidermist, processor, or tanner must be disposed of in trash that is dumped in a sanitary landfill or left on the property where the deer was harvested. You must Telecheck your deer before transporting it (or its parts) out of the county where it was harvested or by 10 p.m. on the day of harvest, whichever comes first.

For taxidermists and meat processors:

- Taxidermists and meat processors are required to dispose of deer, elk, and other cervid parts not returned to customers in a permitted sanitary landfill or transfer station. This requirement does not apply to hides from which all excess tissue has been removed.
- Proof of disposal must be retained for 12 months for meat processors and for three years for taxidermists.

Carcass Movement Restrictions

For hunters bringing deer and other cervids into Missouri from another state:

- Hunters may not transport whole cervid (deer, elk, moose, caribou) carcasses into the state.
- Heads from cervids with the cape attached and no more than 6 inches of neck attached may be brought into Missouri only if they are delivered to a licensed taxidermist within 48 hours of entering Missouri.
- The following cervid parts can be transported into Missouri without restriction:
 - ▶ Meat that is cut and wrapped or that has been boned out
 - ▶ Quarters or other portions of meat with no part of the spinal column or head attached
 - ▶ Hides from which all excess tissue has been removed
 - ▶ Antlers or antlers attached to skull plates or skulls cleaned of all muscle and brain tissue
 - ▶ Upper canine teeth
 - ▶ Finished taxidermy products

Missouri Turtles



THESE ANCIENT AND
LONG-LIVED SPECIES
ARE IMPORTANT TO THE
STATE'S ECOSYSTEM

by Jan Wiese-Fales

Three-toed box turtle

PHOTOGRAPH BY
BEN NICKELSON

Turtles are ancient reptiles — their fossils first recorded more than 200 million years ago. Indigenous cultures credit North America's very existence to turtles, asserting the continent — referred to as Turtle Island in their oral histories — was formed on the back of a giant turtle.

Turtle shells are considered an evolutionary novelty — no other animal exhibits such a structure as part of its physiology. An exquisite singular structure, a turtle's shell essentially is an external skeleton formed from expanded and fused bones — primarily ribs and vertebrae. The shell's domed upper portion is called the carapace; the under shell is the plastron. Both are covered by bony keratin-covered plates called scutes with species-distinctive markings. Softshell turtles are an exception, covered instead with thick leathery skin.

Aquatic turtles' shells have streamlined profiles adapted for swimming, while box turtles have domed shells to navigate the obstacles of traversing life on land. More than just bony armor, turtle shells contain nerves allowing them to feel pressure or touch. Damage to the shell is painful and can even cause bleeding.

Box turtle shells expand with age, adding what looks like growth rings to their scutes. It is a common myth that turtles can be aged by these rings. In truth, this growth has an environmental association — a well-fed turtle's scutes expand more quickly.

"In general, turtles are long-lived," said State Herpetologist Jeff Briggler. "But turtles don't lay a lot of eggs and hatchlings are not fast. There is a lot of predation on nests. As they reach adult size, their prospects for longevity increase. They just need to get by that hump of shell hardness."

With interior organs in fixed positions, a turtle must exhale to make room for its head, legs, and tail when retracting them, often making a hissing sound.

Box turtle's hinged plastron allows them to completely withdraw into their shells. Snapping turtles are unable to fully withdraw their heads but can launch their necks forward toward prey or a perceived threat.

Turtles do not have teeth but rather rely on sharp hooked beaks. In the case of carnivorous turtles, it allows them to tear flesh from potential prey. Many plant-eating turtles shred their meals with serrated beaks.

Freshwater turtles' webbed feet and long claws allow them to propel forward in water and climb onto logs or riverbanks. Box turtles are better adapted for cross-country navigation.

"They all have some sort of adaptation for the environment they live in," Briggler said.

Turtles have a well-developed sense of vision and smell. An eardrum on each side of their head detects movement, pressure changes, and low frequency sounds alerting them to the presence of prey and predators.

There's an opening at the base of a turtle's short tail, called the cloaca, which serves multiple purposes, including waste elimination, sperm transfer, and egg-laying. Some aquatic turtle species take in water and absorb oxygen through their cloaca, earning them the nickname "bum breathers."

All turtles lay eggs on land and may travel long distances to find a suitable spot, usually depositing them in sandy or soft soil. Depending on the species, turtle eggs can be soft- or hard-shelled. Snapping turtles and softshell turtles lay spherical eggs and all other Missouri turtles lay oval or elongated eggs.

MEET MISSOURI'S TURTLES

Of the 56 turtle species native to the United States, 18 species are native to Missouri. They are roughly divided into three groups: hard-shelled land (or terrestrial turtles), softshell aquatic turtles, and hard-shelled aquatic turtles.

It's a misconception that turtles are totally aquatic. Briggler said many species travel over land and among waterbodies for feeding and dispersal purposes, and all species deposit eggs on land.



Western painted turtles

WESTERN PAINTED TURTLES: NOPPADOL PAOTHONG; ORNATE BOX TURTLE, NORTHERN SPINY SOFTSHELL: JIM RATHER; THREE-TOED BOX TURTLES: NOPPADOL PAOTHONG; THREE-TOED FOOT: BEN NICKELSON; MIDLAND SMOOTH SOFTSHELL: RUSS REGAN

HARD-SHELLED LAND (TERRESTRIAL TURTLES)

Missouri is home to the ornate box turtle and the three-toed box turtle, which has been designated the state reptile. Missourians are very familiar with box turtles, witnessing thousands crossing roads, especially in the spring months.

Tragically, hundreds if not thousands of these land-dwelling turtles are killed by vehicles while crossing roadways each year. Many also perish from starvation or abnormal growth at the hands of well-meaning people who capture them as pets. Briggler encourages people to enjoy turtles in nature, but to always leave wildlife wild.

Box turtles, especially three-toed box turtles, only bury themselves under a few inches of soil during the winter months. The three-toed box turtle sometimes is unable to dig deep enough, leading to higher incidents of winter mortality. However, they do produce a type of anti-freeze that allows many to survive freezing winter conditions.



Ornate box turtle



Three-toed box turtle



Three-toed back foot



Three-toed box turtle hatchling

Ornate Box Turtle

(*Terrapene ornata*)

DISTRIBUTION: Statewide, except in the southeast, common in western and northern parts of Missouri

HABITAT: Pastures, open woods, glades, and prairies

FOOD: Insects, small number of berries, tender shoots

DESCRIPTION: Domed upper shell, measuring 4 to 5 inches, is brown with yellow lines. Lower shell is brown with distinct yellow spots and blotches. Head and limbs are brown or black with yellow spots and blotches. Normally four toes on hind legs.

Three-Toed Box Turtle

(*Terrapene triunguis*)

DISTRIBUTION: Statewide, except for extreme north and northwest Missouri

HABITAT: Ozark woodlands, grasslands

FOOD: Insects and earthworms; older turtles eat a large amount of plant matter

DESCRIPTION: Domed upper shell, measuring 4 to 5 inches, is olive or olive-brown with faint yellowish lines radiating from the center of each scute. Lower shell is plain yellow with some brown smudges and a hinge, allowing it to close for protection. Head, neck, and limbs are brown or black with varied amounts of yellow and orange. Most have three toes on each hind foot.

SOFTSHELL AQUATIC TURTLES

Both the midland smooth and the northern spiny softshell live mainly in rivers and reservoirs throughout much of the state. These fast swimmers have snorkel-like snouts that allow them to hide beneath the surface of the water or bury themselves with only their heads slightly showing. They also avoid cold weather by burying in mud underwater. Strong jaws help them defend themselves. Softshells are considered game animals in Missouri with a defined season and bag limit.

Midland Smooth Softshell

(*Apalone mutica mutica*)

DISTRIBUTION: Statewide, uncommon in the Ozarks

HABITAT: Large rivers with abundant sand or mud

FOOD: Aquatic animals including fish, crayfish, tadpoles, snails, and insects

DESCRIPTION: For males, smooth upper shell, measuring 4 to 10 inches, is olive-gray or brown with faint markings of dots and dashes, while a female's shell measures 6 to 14 inches and is mottled with blotches of gray, olive, or brown. Lower shells are a plain cream color. Head and limbs are olive or gray above, and light gray or cream-colored below. A light stripe bordered by black is present behind each eye.

Northern Spiny Softshell

(*Apalone spinifera spinifera*)

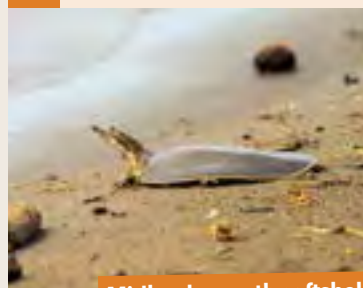
DISTRIBUTION: Statewide

HABITAT: Medium to large rivers, lakes, large ponds, and reservoirs with muddy or sandy bottom

FOOD: Aquatic animals, including fish, crayfish, insects, snails, small mussels, and tadpoles

DESCRIPTION: Male's upper shell, measuring 5 to 12 inches, is olive or grayish tan with distinct, small

black dots, circles, and a black line. Female's upper shell, measuring 7 to 21 inches, is dark olive or tan with brown and gray blotches. The lower shell is cream-colored. The snout is snorkel-like with a small ridge on each side. Head and limbs are normally tan or olive with small brown or black markings. A yellow line, bordered by black, extends from the snout through the eye and along each side of the head.



Midland smooth softshell



Northern spiny softshell

HARD-SHELLED AQUATIC TURTLES

Snapping Turtles

Missouri's two snapping turtle species are the North American snapping turtle, formerly known as the common snapping turtle, and the rare western alligator snapping turtle, the largest freshwater turtle in the world.

"Although the alligator snapping turtle can achieve weights over 200 pounds throughout their range, the heaviest documented individual in Missouri was 128 pounds," Briggler said, adding that few individuals rarely make it to 100 pounds today.

A large riverine turtle, the alligator snapper is most often captured by anglers on hook and line. Due to its large size, land travel can be quite exhausting. An alligator snapping turtle usually sits motionless on the river bottom with its mouth wide open, exposing a wormlike tip on the end of its tongue like fish bait.

"The majority seen on land are females searching for egg-laying sites along river edges," Briggler said. "They look like prehistoric animals walking on tiptoes with extended limbs."

The North American snapping turtle is a common turtle found statewide in a wide variety of wetlands, such as ponds, ditches, swamps, sloughs, and rivers. They also eat a wide variety of animals and even plant material. They are considered a game species with a harvestable season and limit, but it is unlawful to capture or kill the western alligator snapping turtle in Missouri.

Mud and Musk Turtles

Mud and musk turtles are some of the smallest turtle species in the world, three of which make homes in Missouri. These dull-colored turtles have scent glands located between the carapace and plastron that produce a putrid odor when roughly handled. This behavior earned the eastern musk turtle the nickname "stinkpot."

"Mississippi mud turtles, which are found in extreme southeastern Missouri, are one of the more common turtle species in the Bootheel of Missouri," Briggler said. "They are quite often seen crossing roads in the spring while moving among wetlands and searching for egg-laying sites. However, yellow mud turtles live primarily in sandy soils entering wetlands to forage and mate during the spring months. This state endangered turtle occupies small niche corners of the state and is declining."

Basking and Marsh Turtles

With nine species, basking and marsh turtles constitute the greatest number of aquatic hard-shelled turtles. Whether they prefer rivers, ponds, wetlands, sloughs, or swamps, all require easily accessible places to pull out of the water and bask in the sun. According to Briggler, these turtles' sunbathing behavior is for more than just relaxation and thermoregulation.

"Turtles need sun-supplied UV rays to trigger their skin to produce vitamin D that is critical for bone growth and normal shell development," Briggler said. "Basking also promotes overall health of the turtle, by improving digestion, suppressing pathogens and parasites, and reducing the algae growth and rot on the shell."

SNAPPING TURTLES

North American Snapping Turtle

(*Chelydra serpentina*)

DISTRIBUTION: Statewide

HABITAT: Farm ponds, ditches, marshes, swamps, sloughs, rivers, and reservoirs

FOOD: Animal matter and aquatic plants

DESCRIPTION: Upper shell measures 8 to 14 inches, often with mud or algae covering it. Adults weigh 10 to 35 pounds and are normally gray or brown.

Western Alligator Snapping Turtle

(*Macrochelys temminckii*)

SPECIES OF CONSERVATION CONCERN

DISTRIBUTION: Southern, southeastern, and eastern Missouri

HABITAT: Deep, muddy pools of large rivers, deep sloughs, and oxbow lakes

FOOD: Fish, small turtles, snakes, small mammals, crayfish, mollusks, and even nuts and fruits

DESCRIPTIONS: Upper shell, measuring 15 to 20 inches, is dark brown with three prominent rows of ridges. Adults weigh 35 to 150 pounds, with a large head and pronounced hooked beak. Head and limbs are dark brown.

MUD AND MUSK TURTLES

Eastern Musk Turtle

(*Sternotherus odoratus*)

DISTRIBUTION: Nearly statewide, except northern third of the state

HABITAT: Streams, rivers, sloughs, swamps, and large lakes

FOOD: Aquatic insects, earthworms, crayfish, mollusks, small fish, tadpoles, algae, plants and their seed, and dead animals

DESCRIPTION: Nicknamed "stinkpot" and considered the state's smallest turtle species. Domed upper shell, measuring 2 to 4 inches, is dark, gray-brown to black. Its lower shell is yellow, brown, or grayish yellow. It has two yellow stripes on the side of the head and neck.



North American snapping turtle



North American snapping turtle



Western alligator snapping turtle



Western alligator snapping turtle



Eastern musk turtle



Mississippi mud turtle

Mississippi Mud Turtle

(*Kinosternon subrubrum hippocrepis*)

DISTRIBUTION: Southeast Missouri

HABITAT: Swamps, sloughs, oxbow lakes, and canals, most often observed in shallow water

FOOD: Aquatic animals and some plants

DESCRIPTION: Upper shell, measuring 3 to 4 inches, is dark brown or black. Lower shell is yellow with rich brown mottling. Each side of the head and neck have wide, irregular yellow stripes.

Yellow Mud Turtle

(*Kinosternon flavescens*)

STATE ENDANGERED/ SPECIES OF CONSERVATION CONCERN

DISTRIBUTION: Southwest and northeast Missouri, and the Kansas City area

HABITAT: Sandy habitat near wetlands, marshes, oxbow lakes, and flooded fields

FOOD: Aquatic animals (snails are considered a favorite) and plants

DESCRIPTION: Upper shell, measuring 4 to 5 inches, is flattened and usually olive brown. Lower shell is yellow with brown along scute seams. The limbs and upper parts of the head and neck are olive, while the chin and throat are normally yellow.

BASKING AND MARSH TURTLES

False Map Turtle

(*Graptemys pseudogeographica*)

DISTRIBUTION: Statewide in large rivers

HABITAT: Rivers, river sloughs, oxbow lakes, or constructed reservoirs

FOOD: Aquatic plants and animals such as snails, insects, crayfish, and dead fish

DESCRIPTION: Upper shell, measuring 3 to 10 inches, is brown or olive with yellow circles or lines and a serrated hind edge. The lower shell is greenish yellow with light brown lines along scute seams. Head and neck are brown or greenish gray with numerous yellow lines bordered by dark brown or black. A thick, yellow line behind each eye forms a backward "L" shape.

Northern Map Turtle

(*Graptemys geographica*)

DISTRIBUTION: Statewide, except northwestern third and southeast

Habitat: Rivers, sloughs, and oxbow lakes

FOOD: Snails, crayfish, and some insects

DESCRIPTION: Upper shell measures 7 to 10 inches and is brown or olive-brown with a netlike pattern of fine yellow lines, giving an appearance of a topographical map. The hind edge is serrated. Lower shell is light yellow with dark brown seams between the scutes. Head and limbs are brown with thin yellow lines, and a yellow spot appears behind each eye.

Ouachita Map Turtle

(*Graptemys ouachitensis*)

DISTRIBUTION: Southern and eastern Missouri

HABITAT: Slow-moving rivers, sloughs, oxbow lakes, and reservoirs

FOOD: Insects, worms, crayfish, snails, dead fish, and aquatic plants

DESCRIPTION: Upper shell, measuring up to 10 inches, is brown or olive with yellow lines and a raised keel down the center. Lower shell is yellow. Head and limbs are olive with numerous thin, yellow lines. Wide yellow or orange-yellow marking behind each eye and a large yellow spot below each eye.

Eastern River Cooter

(*Pseudemys concinna concinna*)

DISTRIBUTION: Southern half of Missouri

HABITAT: Prefers rivers and sloughs, but also inhabits large reservoirs

FOOD: Aquatic plants, some aquatic insects, snails, and crayfish

DESCRIPTION: Upper shell, measuring 9 to 13 inches, is olive-brown with numerous concentric yellow lines. Lower shell is yellow. Head is small and limbs are normally dark brown or black with many yellow lines.

Western Painted Turtle

(*Chrysemys picta bellii*)

DISTRIBUTION: Statewide, except southeast Missouri

HABITAT: Slow-moving rivers, sloughs, oxbow lakes, ponds, and drainage ditches with ample mud bottom

FOOD: Aquatic plants, snails, crayfish, insects, and some fish

DESCRIPTION: Smooth upper shell, measuring 4 to 8 inches, is olive, olive-brown, or nearly black with yellow, irregular lines and a reddish-orange outer edge. Lower shell is red-orange with a prominent pattern of brown markings that follows scute seams toward the outer edge. Head and legs are dark brown or black and strongly patterned with yellow lines.

Southern Painted Turtle

(*Chrysemys dorsalis*)

DISTRIBUTION: Southeast Missouri

HABITAT: Still, quiet water of shallow swamps, streams, sloughs, and oxbow lakes

FOOD: Aquatic invertebrates, such as snails, crayfish, and insects, and some plant materials

DESCRIPTION: Upper shell, measuring 4 to 5 inches, with an orange or orange-red stripe down the center. Lower shell is yellow, often with an orange or orange-red outer edge.

Red-Eared Slider

(*Trachemys scripta elegans*)

DISTRIBUTION: Statewide, except for extreme north-central Missouri

HABITAT: Rivers, sloughs, oxbow lakes, and constructed lakes and ponds

FOOD: Aquatic plants and animals

DESCRIPTION: Upper shell, measuring 5 to 8 inches, is olive-brown with numerous black and yellow lines. Lower shell is yellow with large, dark-brown blotches on each scute. Head and limbs are dark green with narrow black-and-yellow lines. A distinct red or orange stripe occurs on each side of the head, behind the eye.



Yellow mud turtle



False map turtle



Northern map turtle



Ouachita map turtle



Eastern river cooter



Western painted turtles

Western Chicken Turtle

(*Deirochelys reticularia mearnsi*)

**STATE ENDANGERED/
SPECIES OF
CONSERVATION CONCERN**

DISTRIBUTION:

Southeast Missouri

HABITAT: Slow-moving aquatic habitats, including swamps, river sloughs, oxbow lakes, and drainage ditches

FOOD: Dragonfly and damselfly larvae, crayfish, fishing spiders, and other invertebrates

DESCRIPTION: Oval-shaped upper shell, measuring 4 to 6 inches, is brown or olive with faint yellowish-brown lines forming a netlike pattern. Lower shell is yellow with brown along scute seams. Head and limbs are brown or black with numerous yellow or yellowish-green stripes. The head and long neck are yellow underneath.

Blanding's Turtle

(*Emydoidea blandingii*)

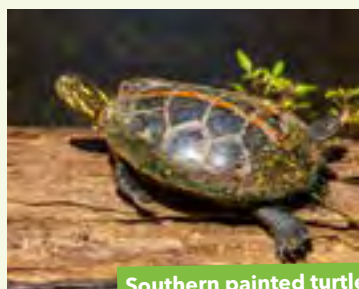
STATE ENDANGERED/ SPECIES OF CONSERVATION CONCERN

DISTRIBUTION: Extreme northeast and northwest Missouri

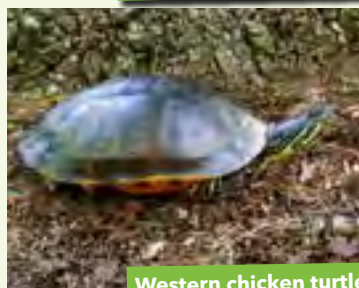
HABITAT: Shallow water along the edge of marshes and river sloughs, also ponds and drainage ditches

FOOD: Crustaceans and a variety of aquatic insects, snails, small fish, and aquatic plants

DESCRIPTION: Oval-shaped and high-domed upper shell, measuring 6 to 9 inches, may be dark brown or black with many yellow spots or bars. Lower shell is yellow with a large, dark-brown blotch on outer portion of each scute, and front third is hinged and movable. Head and limbs are brown and yellow. Chin and underside of long neck are bright yellow.



Southern painted turtle



Western chicken turtle



Blanding's turtle

WESTERN CHICKEN TURTLE: JEFF BRIGGLER; RED-EARED SLIDER: JIM RATHER; SOUTHERN PAINTED TURTLE: NOPPAOOL PAOTIHONG; BLANDING'S TURTLE: JASON D. REYNOLDS; STOCK.ADOBE.COM

Red-eared slider

Life Under the Shell: Not All It's Cracked Up to Be

Turtle species' preferred habitats have declined over the years due to land conversion, draining of wetlands, and river channelization. Add to that poaching, road mortality, and other stressors and you can see that life in the wild isn't easy for turtles.

State Herpetologist Jeff Briggler said it can be difficult to assess wild turtle populations. Through trap-and-release projects, specifically ones focused on endangered or threatened species, Briggler says they can determine how a turtle population is faring.

"We also check environmental DNA," he said. "We can take water samples and have them analyzed for the presence of turtles."

"We're always looking for habitat improvement for turtles. I look at locations to see if we have enough land to support increased populations — enough habitat for them in the long run," Briggler said, adding that MDC partners with other organizations in these efforts, including The Nature Conservancy in the Bootheel and the Ozark Regional Land Trust with easements on some rivers like Bryant Creek and the Gasconade River.

"Missouri's State Parks, the Missouri Department of Natural Resources ... We're all working together," he said.

In cooperation with the Missouri Department of Transportation (MoDOT), MDC is incorporating citizen science into its efforts.

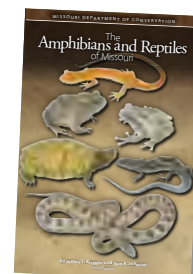
"We've worked with MoDOT to develop an app for people to record dead and live animals on the road, including reptiles and amphibians. If there is a 3-mile section, for instance, where a lot of animals are crossing the road, it helps us with future planning and with informing Missourians about the issue."

The MoDOT app — Roadkill and Observation Data System or ROaDS — is available at short.mdc.mo.gov/oxN.

The tranquil lifestyle of turtles belies the important role they play in sustaining health and balance in their biological communities. They contribute to the control of insects, algae, and aquatic plant and animal populations. Foraging turtles ultimately improve water quality by aerating sediment and recycling nutrients. Their presence serves as a marker for ecosystem health. ▲

Jan Wiese-Fales is a freelance writer who gardens in Howard County and enjoys camping, hiking, floating, and photographing Missouri's wild outdoors.

Want more in-depth information on Missouri turtles? Order *The Amphibians and Reptiles of Missouri*, third edition, for \$29 at www.mdcnatureshop.com. Applicable tax, shipping & handling costs will apply.





Seasons of Wildlife

ON THE FARM

A PHOTOGRAPHER'S VIEW

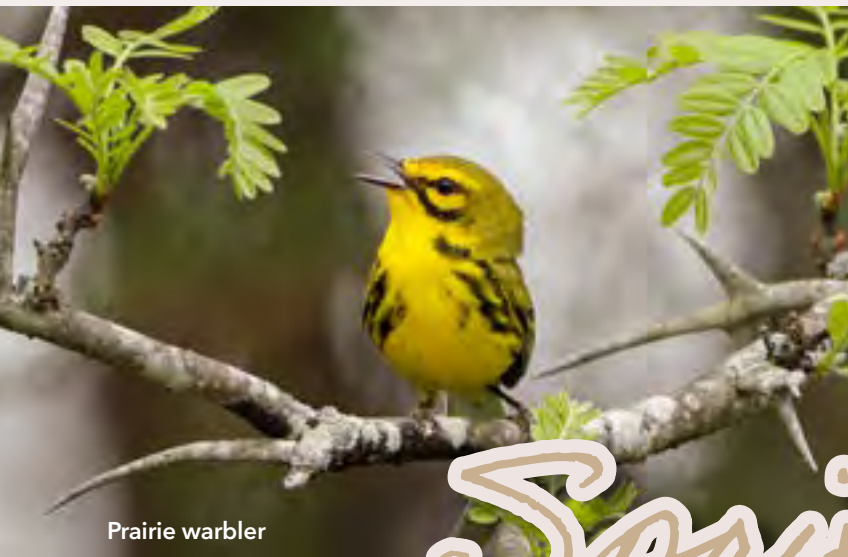
story and photographs by Danny Brown

As a wildlife photographer, I'm often asked, "When is your next big trip?" While I've spent a fair amount of time traveling out west with camera in hand, my focus has always been on Missouri wildlife, especially animals I encounter on the small farm where I live with my wife, Joyce, in Franklin County. Monitoring the behavior of close-to-home wildlife greatly improves my chances of capturing compelling images, but I remain humbled by the ability of critters to sabotage my best laid plans.

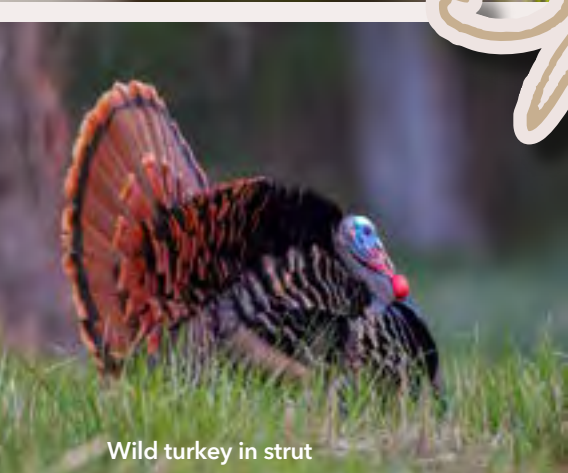
Our farm has been in Joyce's family since her grandparents acquired it in 1939. Joyce's mom, Virginia, who lives next door, recalls helping her father turn the ground for row crops with a walking plow and a team of horses called Dolly and Milly. These days, we still lovingly refer to the property as "The Farm," but it's mostly hayfields, bordered by red cedar, shingle oak, walnut, persimmon, locust, mulberry, and cherry trees. Scattered wild plums, redbuds, and dogwoods add color to the landscape in spring, and by summer the fields are adorned with a variety of colorful forbs. After we built a new house at the site of the original homestead, we converted the adjacent meadow to the east into Indian grass, big bluestem, and native forbs to enhance wildlife diversity.

I approach wildlife photography with the same tactics I've used as a hunter, but with a digital camera and 500 mm lens instead of a shotgun or rifle. I usually shoot from a turkey chair, which is basically a drably colored beach chair that's easy to collapse and carry over my shoulder to my hiding spot. After I'm settled in, I cover my tripod, lens, and camera in camo netting and wait for some action. In cooler weather, I often use a portable pop-up blind for subjects like strutting turkeys in open fields. Most of my shooting is done in the morning and I'm usually set up long before sunrise. I determine my

Raccoon



Prairie warbler



Wild turkey in strut



Drake hooded merganser



Eastern meadowlark



Cedar waxwing eating mulberries

location based on animal behavior patterns, previous observations, wind direction, and most importantly, the direction of the sun's light. After all that, it's simply a matter of patience, perseverance, and luck.

SPRING

Spring is my favorite season, a time of renewal after a long winter. By April, our cedars and wild plums host tiny, colorful warblers in search of insects and caterpillars, fuel for their northward migration. A few species, including prairie warblers, stick around to nest on the farm. Warblers are quite approachable, but a challenge to photograph as they flit nonstop among the branches.

Spring is also the season for wild turkeys — the toms spitting, drumming, and gobbling for aloof hens, their feathers brassy in the morning light. Down at the pond, drake wood ducks show off their dazzling plumage of green, purple, and maroon in contrast to the drab attire of their mates. Occasionally, I'll see a pair of hooded mergansers. The drake's crest, a fan of brilliant white, is a photographer's dream.

Every spring, I look forward to the return of eastern meadowlarks as they court on the hillside behind our house. The males serenade prospective mates from a wooden post I fixed at the highest point in the field. We begin and end every day listening to their melodious whistles. Meadowlarks are quite skittish, so I use a pop-up blind to photograph them in the open field. Sometimes I sit for hours waiting for one to come my way.

Our mulberry trees attract a variety of birds in spring, especially cedar waxwings, often in huge flocks. They are captivating in their dashing black masks and silky plumage of brown and yellow with waxy red wingtips. When the mulberries ripen, I spend most mornings near my favorite tree, waiting for the perfect shot.

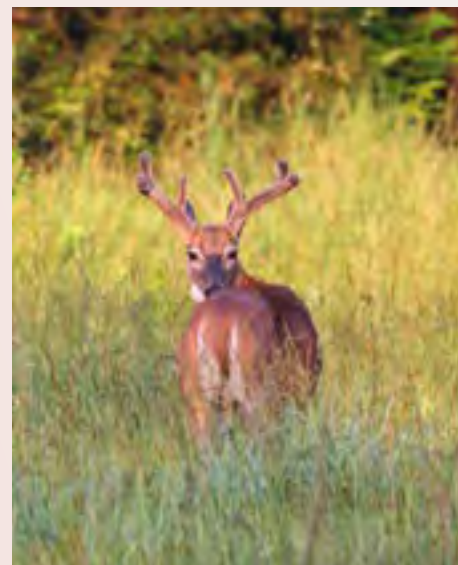
Later in spring, American goldfinches gather each morning in our wildflower garden to gorge on coreopsis seeds. They often perch on spiderwort plants between meals, their vivid yellow plumage exquisite in contrast to the blue flowers. I monitor their activities from my front porch, both camera and coffee at hand.



American goldfinch on spiderwort



Deer fawns watering at the pond



Deer buck in velvet

Other highlights of spring include eastern kingbirds, regal on their sapling thrones out in the fields; blue grosbeaks, easily spotted by their intense blue plumage; eastern towhees, singing *drink your tea* from the tops of cedar trees; and eastern bluebirds, fiercely interacting with rivals as they lay claim to the houses we've provided.

SUMMER

By summer we begin to see white-tailed deer fawns as they chase each other in circles around the fields at sunset. Their mamas keep close watch, occasionally warning them of threats with foot stomps and nostril blows. As fawns mature, they become quite obstinate, requiring firmer direction from their anxious mothers. Summer also brings mature bucks with velvety antlers, often traveling in groups of three or four. Bucks in velvet are spectacular when backlit by the sun at daybreak.

I spend a lot of time at the pond in summer as it attracts a variety of critters. I enjoy watching raccoons as they use their sensitive paws to feel the bottom for invertebrates. On rare occasions I might spot a mink that has wandered up from the Bourbeuse River. Deer often bring their fawns to the pond for a drink in the morning before they stash them in a safe place to spend the rest of their day. Sometimes we get a nesting pair of green herons. I like to photograph them catching tadpoles and salamanders for breakfast. Later in summer, their young squabble over the best floating logs from which to hone their hunting skills.



American mink



Green heron with tadpole



Buddy the barred owl

Fall



Bobcat on the hunt

FALL

Fall is the season for rutting deer bucks with majestic antlers, shed of their velvet cover but often festooned with strips of bark from a favorite rub. They are so focused on breeding, they become less wary, a bonus for photographers. Fall is also a great time to photograph striped skunks as they fatten up for winter. I'll never forget the time a skunk approached me as I sat in my turkey chair along a brushy fencerow. It came all the way in and began sniffing my shoe. I didn't dare budge; I just waited until it lost interest and moved on down the line.

I often see barred owls in fall as they scan the fields for voles. One barred owl, we call Buddy, has hunted from the same cedar trees for years. He also frequents a fence post that marks a drainage pipe in the field behind our house. Buddy doesn't seem to mind when I set up nearby. One time he swept down and caught a vole so close to my pop-up blind that he brushed a wing against the tent.

Fall is a great time to watch young critters as they begin to venture into the fields. One November afternoon I was thrilled to see a pair of bobcat kittens along a tree line next to the field behind our house. They spotted me right away, but I managed to capture a few images from our deck before they faded back into the woods. Bobcats are nocturnal to a fault, at least from a photographer's standpoint, so any sighting is a golden opportunity.

*Capturing
wildlife
images right out
my back door is
an opportunity
I don't take
for granted.*



Deer in a snowfall

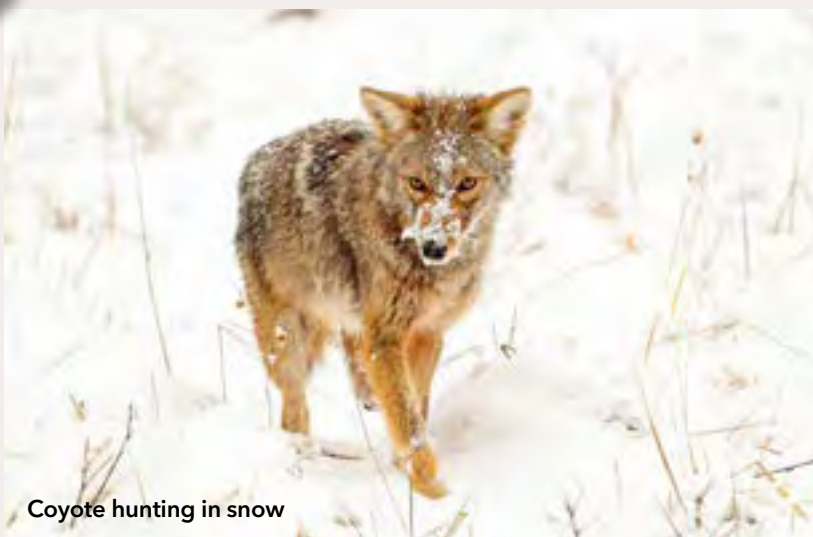
WINTER

Winter is my favorite time to photograph coyotes, imposing in their luxuriant, cold-weather coats. I'm always trying to catch one in mid-pounce before it plunges its muzzle into the snow to extract a fat vole. Deer are also beautiful in winter, especially with fresh snow on their winter coats of gray.

On extremely cold days, Joyce and I enjoy watching bluebirds gather in the heated water dish on our deck, sometimes seven or eight at a time. After a snowfall, I look for cardinals and blue jays, brilliant against the white landscape. Sometimes in winter we get a visit from a flock of American tree sparrows. They come to feed in the Indian grass, riding the tall stems to the ground as they gorge on seed.

I never tire of watching and photographing Missouri wildlife through the changing seasons on the farm. Each day is filled with new possibilities. Capturing wildlife images right out my back door is an opportunity I don't take for granted. Perhaps that's why I'm so compelled to share my experiences. ▲

Danny Brown is a freelance wildlife photographer and writer. He and his wife, Joyce, live on a small farm in Union, Mo.



Coyote hunting in snow



Eastern bluebirds at a heated water dish in winter

What's That Sound?



THE LONG-ABSENT WHISTLES OF QUAIL ARE RETURNING DUE TO NEW MANAGEMENT TECHNIQUES

by Brent Frazee

Brian Gilbert watched as a skid steer ripped through a stand of small trees on the Pony Express Lake Conservation Area (CA) and couldn't help but feel encouraged about the fate of quail in northwest Missouri.

"When I got here in 2014, I looked at maps of all the conservation areas I would manage," said Gilbert, a wildlife biologist for MDC. "From 1975 to 2014, we had lost 1,000 acres of open land to trees.

"We're removing those trees to reclaim those grasslands. When we do, the quail and many other species definitely benefit."

Gilbert has seen proof. At Pony Express Lake CA and other public hunting areas, the long-absent whistles of quail are being heard again.



AERIAL: DAVID STONNER; TREE CLEARING: NOPPADOL PAOTONG

A detailed photograph of a Northern bobwhite quail. The bird is perched on a single strand of barbed wire, facing left with its head tilted upwards and its beak wide open in a call. Its plumage is intricately patterned with brown, black, and white. The background is a soft, out-of-focus yellow-green. The text is positioned in the upper right area of the image.

At Pony Express Lake
CA and other public
hunting areas, the
long-absent whistles
of quail are being
heard again.

Northern bobwhite

PHOTOGRAPH BY
NOPPADOL PAOTHONG

Quail managers are taking a new approach to bring back the birds — from restoring grasslands to conducting controlled burns to providing habitat quail desire. And it's working.

It's not an overnight thing. It's a long, drawn-out battle, and wildlife managers must celebrate small victories.

On a landscape where the news about quail has been mostly discouraging for the last 25 years, new management techniques on private and public land offer hope.

"We've had lots of success stories," said Beth Emmerich, quail biologist for MDC. "It's just not on a large scale. But at least we're seeing that quail can still do well if they have the right type of habitat."

Quail: A Blast from the Past

When it comes to quail, Missouri will never again see an era like the 1950s through the 1970s.

The state's landscape was dominated by small family farms, brushy fencerows, weeds that attracted insects, and prime habitat everywhere you looked.

Quail hunters enjoyed boom times. They routinely shot more than 3 million birds per season and Missouri became a "go-to" state.

"Quail opener was a big deal," Emmerich said. "Little motels were full, just about every truck going down roads had a dog box in it, and some towns got a pretty big economic boost from quail hunting."



But that changed as modern agricultural practices advanced. The quail's world shrank significantly.

Small family farms gave way to larger agricultural operations and cleaner farming. Instead of small fields bordered by good quail habitat, farmers went to large fields with, in many cases, crops in production from fencerow to fencerow. Chemicals were applied to keep the weeds out of fields, so the insects the quail chicks depended on were no longer abundant.

That set off a steady decline in quail numbers that accelerated in the 2000s. Now quail populations are so low in some areas that hunters no longer pursue them.

"It's disheartening to see as a biologist, but you can't blame the farmers,"

Gilbert said. "They're trying to make a living.

"It's our job to show them how they can farm and still set aside good habitat for quail. It can be done."

Rebuilding the Quail's World

As quail have struggled, more research has been devoted to determining what the birds need to thrive.

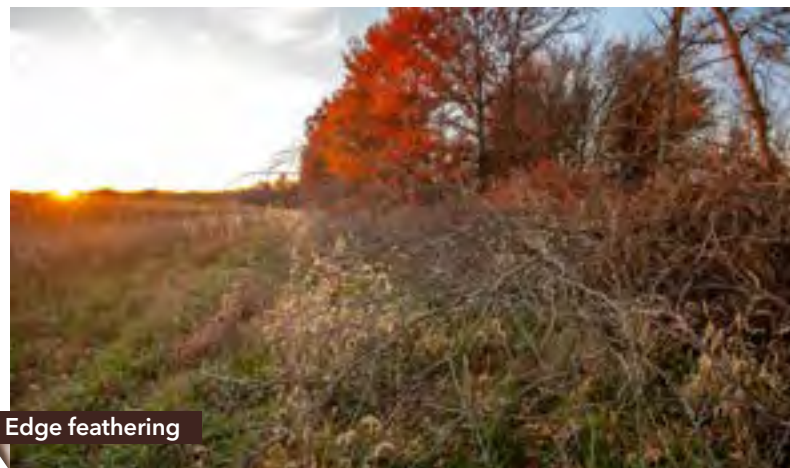
"Years ago, we were planting lots of grass and a few forbs," Gilbert said. "Now, it's just the opposite. We've found that a diversity of forbs and just a little grass is better."

Wildflowers are the key, Gilbert said.





Disking



Edge feathering



Shrubby thickets



Plant diversity

“The more diversity you have in a field, the more insects it attracts and the more the quail chicks have to forage on when they are hatched,” he said.

Those forbs are easier for the quail chicks to negotiate than thick, matted grass. For the first nine weeks of their lives, the quail feed up to 90 percent on small insects, Emmerich said.

The chicks need bare dirt interspersed with forbs so that they can walk around. The forbs provide overhead cover to protect from aerial predators, so it’s a win-win.

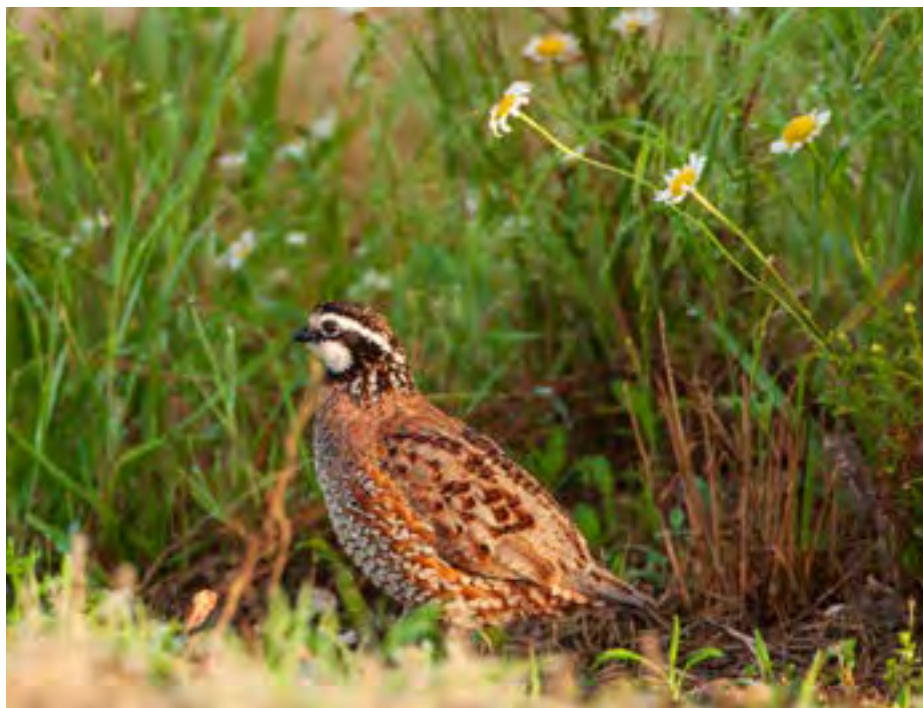
“That ideal brood cover is what we lack the most in Missouri,” Emmerich said.

Through federal programs, such as the Conservation Reserve Program (CRP), farmers are compensated for idling, or temporarily setting aside, marginal crop land to provide wildlife habitat. There are other key factors that play a major role in land management for quail.

- Conduct prescribed burns every two to three years to remove the dead thatch layer from the ground and encourage species diversity. Land disturbance, like light disking, is also beneficial.
- Remove undesirable trees from the landscape, which limits predator perches and provides additional escape cover when loosely stacked.
- Give quail a place to escape winter’s snow, ice, and bitter temperatures by providing shrubby shelterbelts and thickets.
- Plant a diverse native mix of grasses and wildflower species.

“We have people who will call us all the time wondering what has happened to the quail,” Emmerich said. “They tell us their farms haven’t changed since they had a lot of birds, but they’re gone now.

“Well, in reality, their land has changed quite a bit over time. Habitat changes slowly and people don’t notice it. Cleaner farming, fescue, which creates a monoculture that isn’t good for quail, more tree growth ... it all adds up.”



Private Land Success

Bob Borman, 77, has spent more than 50 years hunting quail.

"The first time I stepped into a covey of quail, it was a thrill," said Borman, who owns and leases land northeast of Kingston. "It still is. That feeling just never goes away."

Once, he almost took for granted the excitement of watching his bird dogs flush a covey of quail. Now that the populations have declined, he treasures those moments even more.

Some quail hunters gave up as the bird populations plummeted. Not Borman. He dedicated himself to following recommendations from MDC and other agencies on how to improve quail habitat and went to work.

He even opened a small business focusing on habitat management, and bought some small farm equipment to plant food plots and other habitat.

"I can get into corners where some big machinery can't go and put down habitat, and it's really helped," said Borman, a life member of Quail Forever and Pheasants Forever. "Same thing for some of this CRP land. If you put down a diversified mix of forbs, you can see how it helps."

"I've definitely seen quail numbers rise on some of the land where I've done habitat work."

Jim Denny of Fayette has seen the same thing. A retired ear, nose, and throat doctor, he had been away from his family farm in central Missouri for years. When he inherited the piece of land that had been in his family since 1818, he was disappointed to see that much of the wildlife was gone.

"I decided to try to restore things to the way they used to be when I would be up there to spend summers on my grandparents' farm," he said.

He went to MDC's Community and Private Land Conservation Branch and followed an aggressive habitat plan to make the CRP on his property more appealing to wildlife. Today, there are deer, turkeys, and at least five coveys of quail.

Denny will long remember a moment last fall when he was in a tree stand hunting deer.

"I saw 50 to 75 quail marching across a cornfield," he said. "I knew then that the habitat work I was doing was paying off."

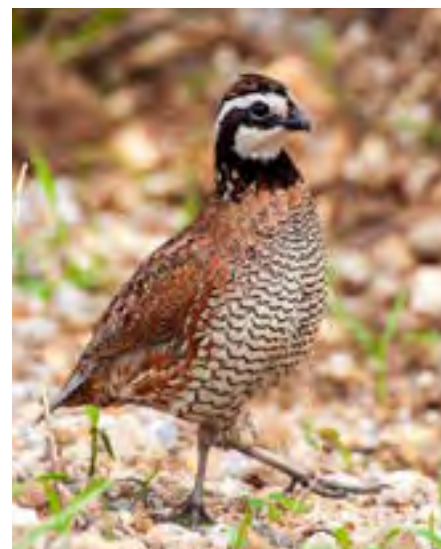
But Denny doesn't plan to hunt those birds. He is just happy to provide them with a place to live.

"None of the quail here are hunted, except by coyotes," he said. "We're just happy to see and hear them again."

Cautious Optimism

Terry Rouse, 65, is another quail hunter who would like to relive the good old days.

He worked for Natural Resources Conservation Service, a division of the U.S. Department of Agriculture, for 40 years. He helped agricultural producers with crop plans that included habitat management.





Research indicates open landscapes provide higher nesting success.



GETTING STARTED

Contact your regional office (see Page 29) and ask for your private land conservationist. He or she will assess your property and issue a report on what is needed and offer assistance through state or federal cost-share programs. If you prefer to hunt public land, find a list of quail restoration landscapes, where MDC biologists have emphasized quail management and habitat improvement, at short.mdc.mo.gov/occ.



He also remembers good days in the field, following one of his German shorthair bird dogs through the brushy cover.

Now, the birds are fewer and far between. But Rouse continues to hunt hard. He chased quail or pheasants in Minnesota, Wisconsin, South Dakota, and Iowa, in addition to Missouri last season.

He isn't encountering large numbers of quail like he once did. But he sees encouraging signs.

"If you don't burn, if you don't disturb the soil, the quail aren't going to come back on their own," he said. "I think this aggressive management we're seeing is helping.

"If I can take a dog out and find a covey or two, I'm happy. And we're doing that." ▲

Brent Frazee is an award-winning writer and photographer who was the outdoors editor of The Kansas City Star for 36 years before retiring in 2016. He continues to freelance for magazines, newspapers, and websites. He lives in Parkville with his wife, Jana, and two yellow labs, Millie and Maggie.

Get Outside in OCTOBER

Ways to connect
with nature

October's Fall Color Forecast

In last month's issue, we brought you September's fall color forecast. But the show was just getting started. Missouri is blessed with such a large variety of trees, shrubs, and woody vines, that fall's color change can last up to eight weeks.

The forecast for October is calling for peak fall color. This month, look for maples, ashes, hickories, and oaks, which will be at the height of their fall color display.

Plan to get out early because by late October, the colors are fading and the leaves are beginning to drop. Fall color is usually finished by mid-November.



White oak leaf



Northern red oak leaf



Maple leaf

Bears in the Woods

There are bears in the woods this fall, but not the kind you might think. **Woolly bears** are commonly seen crossing roads in the autumn as they search for sheltered places in which to overwinter. These are juveniles of the Isabella tiger moth. Folklore has long maintained that the varying widths of the caterpillar's bands are useful for predicting the harshness of the upcoming winter. If the rusty-red band is wide, the winter will be mild, but if it is narrow, the winter will be severe.



Feed Your Neighbors

The Share the Harvest program allows hunters to donate venison to feed the hungry. The Missouri Conservation Heritage Foundation — in collaboration with MDC and the Conservation Federation of Missouri — is raising much-needed funds for this inspiring community driven program.

For every doe you donate from Oct. 9–11 — or \$125 you give to cover the processing of one deer, which provides 160 meals — you will receive one hunting knife with the Share the Harvest logo. Limited to the first 100 deer donors and 100 financial donors. For more information, visit short.mdc.mo.gov/oGF.



**SHARE THE
HARVEST**



Natural Events to See This Month

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



Dark-eyed
juncos
arrive.



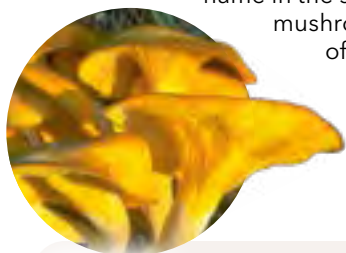
Green-
winged
teal
migration
is at its
peak.



Beavers
are active
during
the day.

Jack-O'-Lanterns in the Woods

Did you know you might find some jack-o'-lanterns in the woods, just in time for Halloween? But they aren't the jack-o'-lanterns you carve and put out on your porch to greet trick-or-treaters. These are **jack-o'-lantern mushrooms**. They form in showy orange clusters at the bases of trees. They are quite poisonous, so just enjoy them for their looks and their name in the spirit of the season. If you are looking for mushrooms of the edible variety, look for hen of the woods, which are a choice edible.



Always be certain of your mushroom identification before consuming. For more information, consult *A Guide to Missouri's Edible and Poisonous Mushrooms* at short.mdc.mo.gov/ZNf.

VIRTUAL

Stream Team Orientation and Onboarding

Saturday • Oct. 24 • 1-2 p.m.

Online only

Registration required by Oct. 24. For more information, call 888-283-0364 or visit short.mdc.mo.gov/oGj.

All ages

This live and interactive program introduces the Stream Team Program to prospective and new volunteers. During the session, we will cover:

- What is Stream Team and how can you get involved?
- How can you register and create or join a team?
- How can you report your service activities?
- Where can you find nearby events and opportunities?

VIRTUAL

DEER HUNTING: After Your Harvest

Thursday • Oct. 15 • 5:30 p.m.-6:30 p.m.

Online only

Registration required by Oct. 15. For more information, call 888-283-0364 or visit short.mdc.mo.gov/oGC.

All ages

In this beginner's class, find out how to skin and quarter your harvested deer. We will use videos to demonstrate techniques. We will also show examples of equipment and tools used and provide answers to any questions you may have about do-it-yourself processing.



North American bullfrogs burrow to overwinter.



Muskies become active.

→ CONSERVATION NEAR YOU

Craving more local conservation connections? Find events near you at mdc.mo.gov/events, or catch the latest on social media. Reach out to your closest regional office and learn about events from MDC staff. Outdoor fun awaits. Get out there!



Get Social

Join the conversation and connect with us on social media. Search "MO Conservation" to follow us on Twitter (X), Facebook, YouTube, Instagram, Pinterest, and Flickr.



Conservation Headquarters

573-751-4115

PO Box 180, Jefferson City, MO 65102-0180

Regional Offices

Central

573-815-7900

3500 E Gans Rd
Columbia, MO 65201

Kansas City

816-622-0900

12405 SE Ranson Rd
Lees Summit, MO 64082

Northeast

660-785-2420

3500 S Baltimore
Kirksville, MO 63501

Northwest

816-271-3100

701 James McCarthy Dr
St. Joseph, MO 64507

Ozark

417-256-7161

551 Joe Jones Blvd
West Plains, MO 65775



Southeast

573-290-5730

2302 County Park Dr
Cape Girardeau, MO 63701

Southwest

417-895-6880

2630 N Mayfair
Springfield, MO 65803

St. Louis

636-441-4554

2360 Hwy D
St. Charles, MO 63304

Places to Go

CENTRAL REGION

Prairie Fork Conservation Area

A story of transitions

by Larry Archer

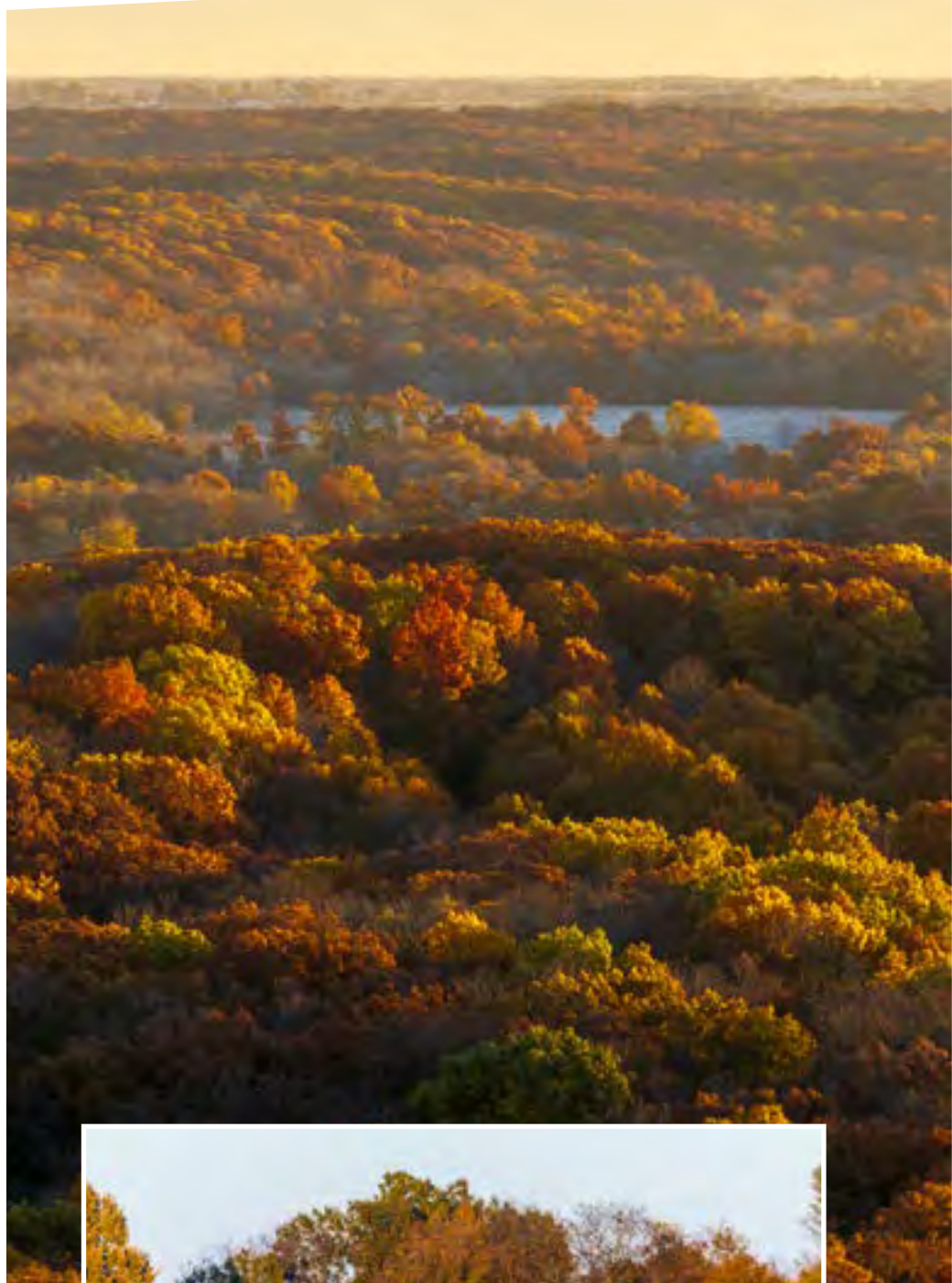
✱ The story of Prairie Fork Conservation Area (CA) is a story of transitions: from traditional prairie on the north end to the Missouri River woodland hills on the south; from a working cattle ranch to a showcase prairie; and from a private homestead to a public use area whose mission is restoration, education, and research.

Located on 920 acres in Callaway County, the Prairie Fork CA property was donated in 1997 by Pat Jones, who, with her husband, Ted, is known for their contributions to conservation and outdoor recreation. Once the couple's home, the area now hosts educational groups, research projects, and individual outdoor activities like hiking, nature viewing, photography, and more, said MDC Wildlife Biologist Jeff Demand.

With additional resources from Jones' Prairie Fork Trust, MDC has restored the prairies that originally dominated the area, Demand said.

"If I had to highlight one thing on Prairie Fork that's probably the best, we have some of the highest quality reconstructed prairies in the Midwest," he said. "We have over 300 species of plants in our prairies."

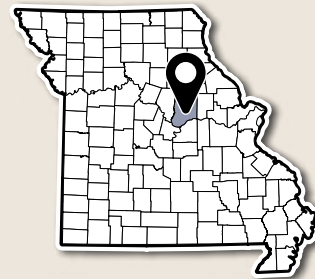
Unlike most other conservation areas, Prairie Fork CA is closed to hunting, fishing, or collecting. A daily use permit is required for entrance and is available online at prairiefork.org.



DAVID STONNER



The setting sun highlights the autumn color that blankets the landscape of mature oak and hickory forest at the 920-acre Prairie Fork Conservation Area in Callaway County. A system of more than 6 miles of mowed or gravel trails allows visitors to see the area's forest, prairie, and savanna habitats (inset).



PRAIRIE FORK CONSERVATION AREA

consists of 920.1 acres in Callaway County. From Williamsburg I-70 Exit #161, take Route D north to stop sign, then west 2 miles, then south crossing I-70 and continuing 2 miles to the area.

38.8924, -91.7406

short.mdc.mo.gov/oSM prairiefork.org

573-815-7900

WHAT TO DO WHEN YOU VISIT



Birdwatching

The eBird list of birds recorded at Prairie Fork CA is available at **short.mdc.mo.gov/oSg**.



Hiking

Six designated trails between ½ to 1½ miles long, totaling 6½ miles of mowed or gravel surfaces.



Nature Viewing

The area has high-quality prairies, woodlands, and streams.



Short-eared owl

WHAT TO LOOK FOR WHEN YOU VISIT



Bobcat



American beaver



Red fox



Dickcissel



Trashline Orbweavers

Cyclosa conica and *Cyclosa turbinata*

Status
Common

Size
Length (not counting legs):
females 1/8–1/4 inch; males about 1/8 inch

Distribution
Statewide

The webs of trashline orbweavers are more conspicuous than the spiders themselves. The webs are small, circular orbs that the spider “decorates” with a line of debris — the dried husks of insects it has eaten plus other bits of debris, wrapped loosely with silk into a straight line. The tiny, well-camouflaged spider typically rests in the center of her “trash line,” almost always at the hub of the web. Two species of trashline orbweavers occur in Missouri — conical trashline orbweaver (*Cyclosa conica*) and humped trashline orbweaver (*Cyclosa turbinata*). The conical is the larger of the two, while the humped trashline orbweaver has two humps on the top of the abdomen that resemble shoulders.



LIFE CYCLE

Females hide their egg cases amongst the debris-filled trashline. During the first freeze, adult trashline orbweavers die, leaving young spiderlings to fend for themselves when they emerge from their egg sacs in the spring. To disperse, the young spiders climb to the top of an object, wait for a breeze, let out a loop of silk, and jump, letting the breeze carry them away. This is called “ballooning.”



ECOSYSTEM CONNECTIONS

Trashline orbweavers serve a dual role in the ecosystem. As predators, they eat a variety of small flying insects, including mosquitoes, midges, moths, small beetles and bugs, and houseflies. As prey, they employ an unusual camouflage to fend off potential predators. Their trashlines look like bird droppings that have run down the web and dried, making it look derelict and old. This would put these spiders into the same category as several types of butterflies and moths, whose caterpillars also resemble bird droppings. In each case, this camouflage sends a message to would-be predators — “Move along. Nothing to see here.”

Outdoor Calendar

MISSOURI DEPARTMENT OF CONSERVATION

FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:

- ▶ Catch-and-Keep:
May 23, 2026–Feb. 28, 2027

Bullfrog, Green Frog

June 30 at sunset–Oct. 31, 2026

Nongame Fish Giggling

Streams and impounded waters,
sunrise to midnight:
Sept. 15, 2026–Feb. 15, 2027

Paddlefish

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

Trout Parks

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

Catch-and-Keep:
March 1–Oct. 31, 2026

Catch-and-Release:
Nov. 13, 2026–Feb. 8, 2027

TRAPPING

Opossum, Raccoon, Striped Skunk

Only foot-enclosing traps and
cage-type traps may be used.

Aug. 1–Oct. 15, 2026

HUNTING

Black Bear*

Oct. 17–30, 2026

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

Crows

Nov. 1, 2026–March 3, 2027

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

Doves

Sept. 1–Nov. 29, 2026

Elk*

Archery:

Oct. 17–25, 2026

Firearms:

Dec. 12–20, 2026

Groundhog (Woodchuck)

May 11–Dec. 15, 2026

Opossum, Raccoon, Striped Skunk

Aug. 1–Oct. 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

Sora, Virginia Rail

Sept. 1–Nov. 9, 2026

Squirrels

May 23, 2026–Feb. 15, 2027

Turkey

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.

Wilson's (Common) Snipe

Sept. 1–Dec. 16, 2026

Woodcock

Oct. 18–Dec. 1, 2026

*Only hunters selected through a random drawing
may participate in these hunting seasons.

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.

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EXPAND THE PROGRAM'S REACH TO
MANAGE DEER AND FEED FAMILIES.

\$5



Serving nature and you®

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.

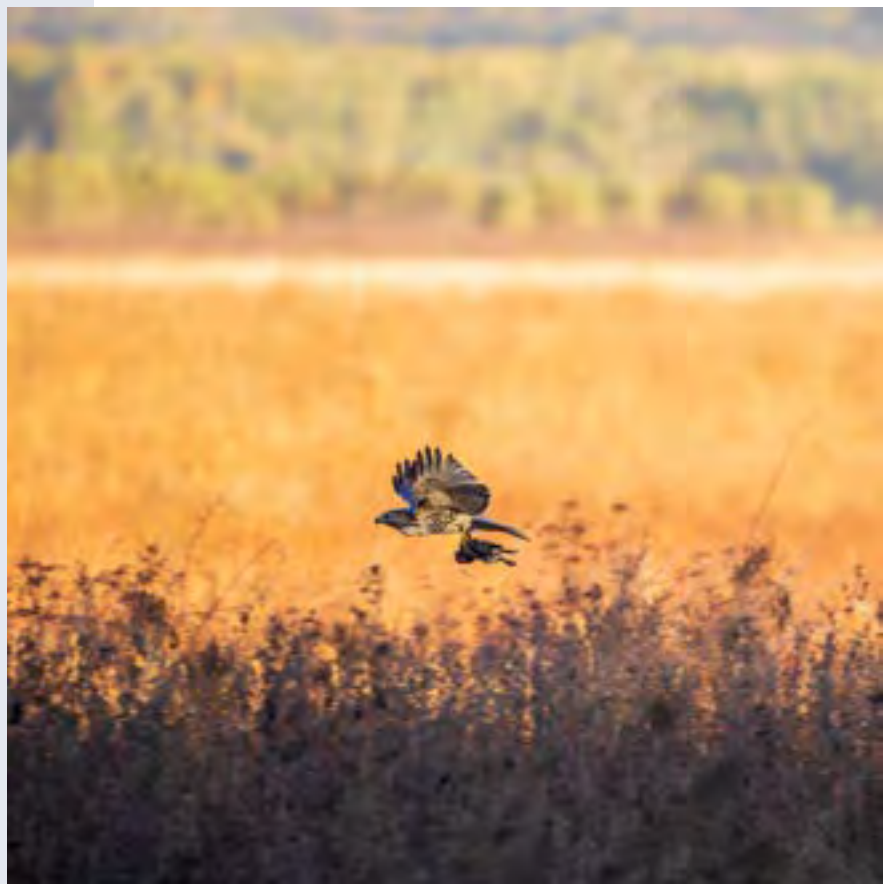
Free to Missouri households

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@moconservation



A red-tailed hawk is captured mid-flight carrying its prey, a muskrat, at Loess Bluffs National Wildlife Refuge.

📷 by **David Stonner**