MISSOURI CONSERVATIONIST

VOLUME 80, ISSUE 7, JULY 2019

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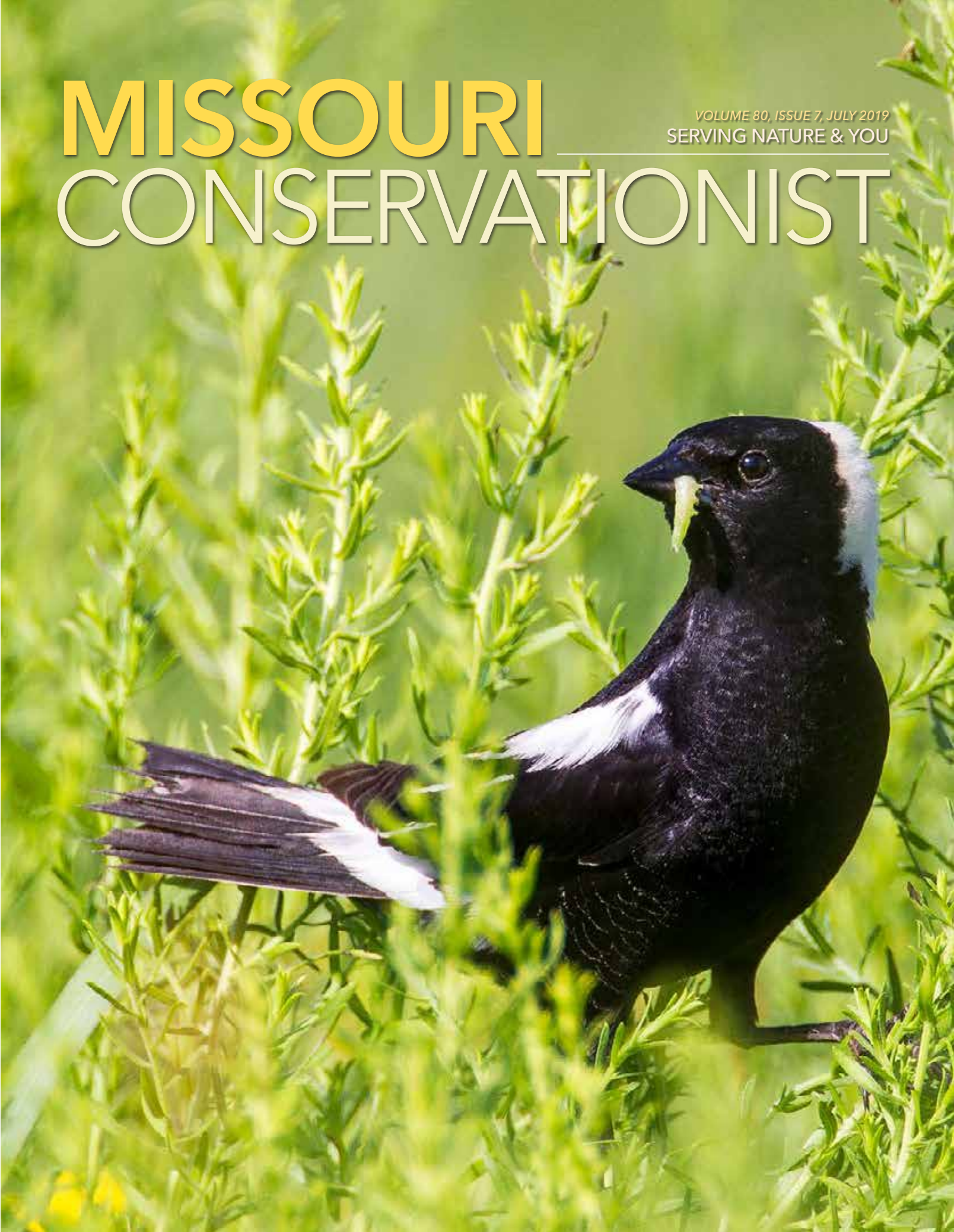

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MISSOURI CONSERVATIONIST

ON THE COVER
A bobolink enjoys a caterpillar

NOPPADOL PAOTHONG
500mm lens +2.0 teleconverter
f/8, 1/320 sec, ISO 200

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Letters to the Editor
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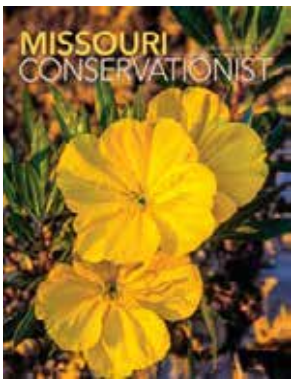

WELCOME TO MO

We absolutely love this publication. As newcomers to Missouri, we learn something new each month.

Ruthann Rackawack Caulfield

URBAN FISHING

I really enjoyed your article on urban fishing [*50 Years of Urban Fishing in St. Louis*, April, Page 10]. My younger brother and I shared fond memories of a little pond in Clifton Park. Although I now live in New Jersey, I still have family and friends in Missouri and enjoy reading the *Missouri Conservationist*.

John Burghardt Mullica Hill, NJ

Your article in the April magazine reminded me of the many wonderful hours my brothers and I spent fishing the ponds in Forest Park during the late 1950s. We would stop by the local grocery store and the butcher would supply us with liver and off we would go with our cane poles in hand. One of the ponds we frequented was located next to the Municipal Opera. Not only were we able to enjoy trying to catch a channel cat or a carp, but we could hear the beautiful music that was being rehearsed only a few yards from us. What an experience for a 10-year-old.

Danny Marshall Steelville

FALCON PRIDE

At Van Horn High School, we love receiving the *Missouri Conservationist* each month because our biology teachers use it to supplement their instruction. You can imagine the excitement when we saw a peregrine falcon on the cover of the April issue. We are the home of the Fighting Falcons and it was great to learn about our mascot and how they are making such a great comeback in our state. Thank you for producing such a great magazine for our students and teachers. Fly to the sky Falcons! Ka-Ka!

Dr. Justin Woods Principal

LOVE FROM ACROSS THE POND

Thanks to our dear friends in Warsaw, we receive the *Conservationist* every month. We love your articles and wonderful photographs. Missouri certainly seems to lead the way in conservation. We always pass on the magazines to a neighbor here in North Yorkshire. His sister lives in America and as a true countryman from a farming family, he loves to read them. We often talk about some of the wonderful times we have spent in your lovely state.

Sue Oswell North Yorkshire, England

UNUSUAL VISITOR

Early one morning, our doorbell rang. My wife answered, but no one was there. This went on several more times. With the help of my walker, I hobbled to the door. I looked through the screen window and hanging onto the bar next to the door was a giant raccoon, staring me in the face as if to say, "Let me in!" I banged on the door a couple times, but it didn't seem to bother him. The doorbell kept ringing. I called the Carthage Police Department and an animal control officer arrived. By this time the raccoon had given up ringing the doorbell and was laying down asleep in front of our door. The officer had no problem getting the raccoon in a cage. I told the officer it was so friendly and not afraid. She agreed.

Norman Knight Carthage

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Have a Question for a Commissioner?
Send a note using our online contact form at mdc.mo.gov/commissioners.

Want to see your photos in the Missouri Conservationist?

Share your photos on Flickr at flickr.com/groups/mdcreaderphotos–2019, email Readerphoto@mdc.mo.gov, or include the hashtag #mdcdiscovernature on your Instagram photos.

1 | Victoria Glades Conservation Area by carrico17, via Instagram

2 | Millstream Gardens Conservation Area by path_less_traveled_19, via Instagram

3 | Longear sunfish in the Black River by Monica Laramie, via email

Up Front

with Sara Parker Pauley

There is such a beauty to community, particularly when in times of need, a community rises to the call. As I think back over the last couple of months with the flooding and storms that have ravaged our state, I've witnessed Missourians rallying to rescue, reinforce, and rebuild.

MDC alone has had more than 180 conservation areas and accesses impacted by recent flooding. While some MDC staff has worked tirelessly to keep floodwaters from impacting hatcheries or other vital infrastructure, conservation agents around the state performed swift water rescues and assisted with other emergency response efforts.

This round of flooding was even more personal for me. Close to the Missouri River, our community came together to fortify our neighbor's levee in an effort to save his fields, but ultimately the river won. Still, it was powerful to see neighbors showing up in a time of need to offer their best efforts.

Also, beautiful is a community that comes together for the longer haul, such as neighbors working together to nurture their land collectively to further the conservation cause. In a state with over 90% of our lands in private ownership, we simply cannot protect and connect with nature on public lands alone. Aldo Leopold comes to mind when he said, "Conservation can accomplish its objectives only when it springs from an impelling conviction on the part of private landowners."

In this issue, you will read of such conviction on Page 10 and witness again the amazing and persevering power of community.

Sara Parker Pauley

SARA PARKER PAULEY, DIRECTOR
SARA.PAULEY@MDC.MO.GOV

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Nature LAB

by Bonnie Chasteen

Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

Silver-haired bat

SPECIES OF CONSERVATION CONCERN

Bats and Wind Energy

As entities consider more wind energy projects in Missouri, the state's bats face the threats of habitat loss and devastating diseases like white-nose syndrome. What level of wind-generated power development can occur without further harming already-stressed bat populations?

Missouri State Bat Ecologist Kathryn Womack-Bulliner has been working with the U.S. Fish and Wildlife Service to estimate the occupancy of bats in areas of likely wind energy development in the Show-Me State.

Their goal is to understand bat species occupancy prior to wind energy development to better advise developers how they can "reduce the impact to Missouri's fish, forest, and wildlife species that we all love," she said. "These include federally listed species, Missouri species of conservation concern, and also to provide siting considerations in relation to MDC conservation areas."

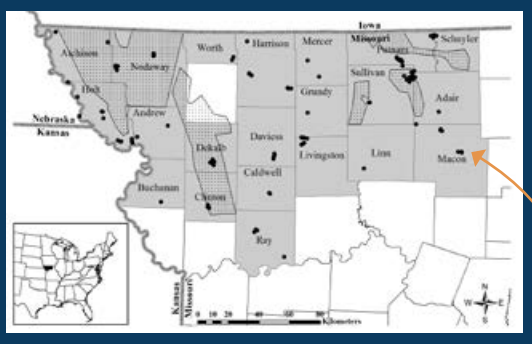
Study suggests need for a process that identifies the potential impacts of wind-energy projects on Missouri's bats

Understanding whether wind turbine-caused bat fatalities in an area could cause bat population declines requires data.

To fill this information gap, study partners conducted 4,269 detector nights of acoustical monitoring at 120 sites in north Missouri.

Overall, the study found that patterns of bat occupancy are species-specific, making it difficult to develop blanket guidance for the placement of wind turbines. "Each wind-development site has different fish, forest, and wildlife concerns," Womack-Bulliner said. "Therefore, it is critical to look at site-specific risks to understand the potential impacts and to focus mitigation efforts."

Bats and Wind Energy at a Glance



Study Period
Spring, Summer, and Fall of 2013–2017

120 Study Sites
Dots represent sites.

4,269 Detector Nights of Monitoring
Study partners placed acoustic detectors at sites where wind energy development is suitable, and bats were likely to occur for at least three nights per season. They recorded and identified bat echolocation calls using an automated ID program and expertise to determine occupancy at a site each night.

9 Species Detected

3 Federally Listed
- Indiana bat
- Gray bat
- Northern long-eared bat

4 Missouri Species of Conservation Concern
- Silver-haired bat
- Hoary bat
- Little brown bat
- Tri-colored bat

2 Other Species
- Eastern red bat
- Evening bat

SILVER-HAIRED BAT: NOPPADOL PAOTHONG; RESEARCH: DAVID STONNER

News and updates from MDC

In Brief

A bowhunter takes aim at a deer from a tree stand.

DAVID STONNER

WE WANT YOUR FEEDBACK ON PERMIT CHANGES

The Missouri Conservation Commission gave initial approval of changes to permits and the permit system at its May 23 meeting, and MDC wants public input. The changes include:

- Increasing prices for nonresident hunting and fishing permits
- Offering discounted deer and turkey permits for some nonresident landowners
- Adjusting acreage requirements for free landowner permits and privileges from a minimum of 5 acres to a proposed 20 acres
- Implementing a landowner registry to qualify for free landowner permits
- Increasing the prices of annual trout permits and daily trout tags

To comment on the proposed changes, visit **short.mdc.mo.gov/Z49**.

The next step in the rulemaking process is a public comment period during July and early August. Comments received will be considered, and final proposals will then go to the commission for further action at its Aug. 23 meeting. If enacted, the changes will become effective in February 2020.

For more information on changes to landowner permits, visit **short.mdc.mo.gov/ZxP**.

For more information on changes to nonresident permits, visit **short.mdc.mo.gov/ZxW**.

For more information on increases to trout permits and tags, visit **short.mdc.mo.gov/Zxm**.

SHOOTING RANGE PRICES INCREASE

Starting July 1, fees at MDC's five staffed shooting ranges will increase for the first time in nearly 20 years. The current fee of $3 per hour on the rifle, handgun, patterning, or archery ranges and $3 per round on the trap/skeet ranges will increase to $4 per round or hour.

The price increase will apply to Andy Dalton Shooting Range and Outdoor Education Center in Greene County, August A. Busch Memorial Conservation Area Shooting Range and Outdoor Education Center in Saint Charles County, Jay Henges Shooting Range and Outdoor Education Center in Saint Louis County, Lake City Range in Jackson County, and Parma Woods Range and Training Center in Platte County.

Learn more about our staffed shooting ranges at **short.mdc.mo.gov/ZZF**.

OPEN HOUSES ON BLACK BEARS

MDC invites you to a series of open houses to learn more about black bears in Missouri. The open houses will include information on MDC black bear research projects and management efforts, our draft black bear management plan, potential future hunting opportunities, and how to handle conflicts with nuisance bears. MDC staff will also be taking comments on these and other related topics.

The meetings will be from 6–8 p.m., with a presentation at 6 p.m. No registration is required.

- **July 9 — MDC Springfield Conservation Nature Center**, 4601 S. Nature Center Way in Springfield
- **July 11 — The Landing**, 110 Front St. in Van Buren
- **July 18 — First Baptist Church**, 202 Walnut St. in West Plains
- **July 30 — MDC Powder Valley Conservation Nature Center**, 11715 Cragwold Road in St. Louis

For more information, contact MDC Public Involvement Coordinator Michele Baumer at Michele.Baumer@mdc.mo.gov or 573-522-4115, ext. 3350.

Black bear

Ask **MDC**

Got a Question for Ask MDC?
Send it to AskMDC@mdc.mo.gov
or call 573-522-4115, ext. 3848.

Q. I found this web at Pickle Springs Natural Area. What spider made it?

➔ The spined micrathena (*Micrathena gracilis*) is one of three species of Micrathena spiders found in Missouri that are also known as spiny orbweavers because of the conical-shaped protuberances on their bodies and their ability to spin intricate, circular webs.

Because of their small size, these spiders are frequently overlooked. But if you've ever ran into a spider's eye-level silk dragline while hiking down a trail, you've probably encountered them.

Males and females mature in early summer and females can be found until October. Female spined micrathenas typically are black and white, have five pairs of black conical protuberances encircling their abdomens, and are twice as big as males. Males visit females in their webs, but their courtship can prove fatal, since they are often eaten to provide nourishment to their mates and offspring.

These spiders are commonly found in woodland areas, but they also like suburban settings. They rarely enter homes and are not known to bite people.

Like many spiders, they capture insects in the sticky strands of their webs. Once caught, a dose of venom subdues their prey and starts the digestion process. Although humans tend to fear spiders, they control insects naturally. Additionally, these spiders provide some of the sticky webbing hummingbirds use to build their own nests.

Female spined micrathena

Q. Shortly after sunset, I heard whistles coming from the woods — short, one-syllable sounds that started out loudly and faded quickly. The closer they were, the raspier. What was making these whistles?

➔ You are hearing young barred owls calling to their parents. To beg for food and make their parents aware of their location, these owls emit a one-note call that can vary from a melodic whistle to a raspy hiss. To hear their begging calls, visit **allaboutbirds.org/guide/Barred_Owl/sounds**.

Barred owls don't migrate, or even move far away. According to the Cornell Lab of Ornithology, of

SPINED MICRATHENA WEB: CAROLYN CLAY; SPINED MICRATHENA: STURGIS MCKEEVER, GEORGIA SOUTHERN UNIVERSITY, BUGWOOD.ORG; BARRED OWL: JIM RATHERT

Juvenile barred owl

158 birds banded and rediscovered, none had moved more than 6 miles away. So, the juvenile barred owls you are hearing in your neighborhood may stay nearby.

Barred owls often nest in natural cavities in mature forests but will also use human-made nest boxes. To attract a breeding pair, you might consider putting up a box this fall. To learn more, visit **nestwatch.org/learn/all-about-birdhouses/birds/barred-owl**.

Q. I recently saw a video of a tree squirrel eating a young bird. I have never heard of this. Is this common or a freak phenomenon?

→ While not commonly observed, it is not uncommon.

Squirrels have an extremely varied diet, eating parts of about 100 different species of plants. Squirrels eat the nuts, twigs, buds, flowers, berries, seeds, and wild fruits of hickory, pecan, oak, walnut, elm, and mulberry trees. They may also occasionally eat eggs and young birds. Insects and insect larvae are eaten in small amounts as well, mostly in late spring and summer.

What IS it?

Can you guess this month's natural wonder?

The answer is on Page 9.

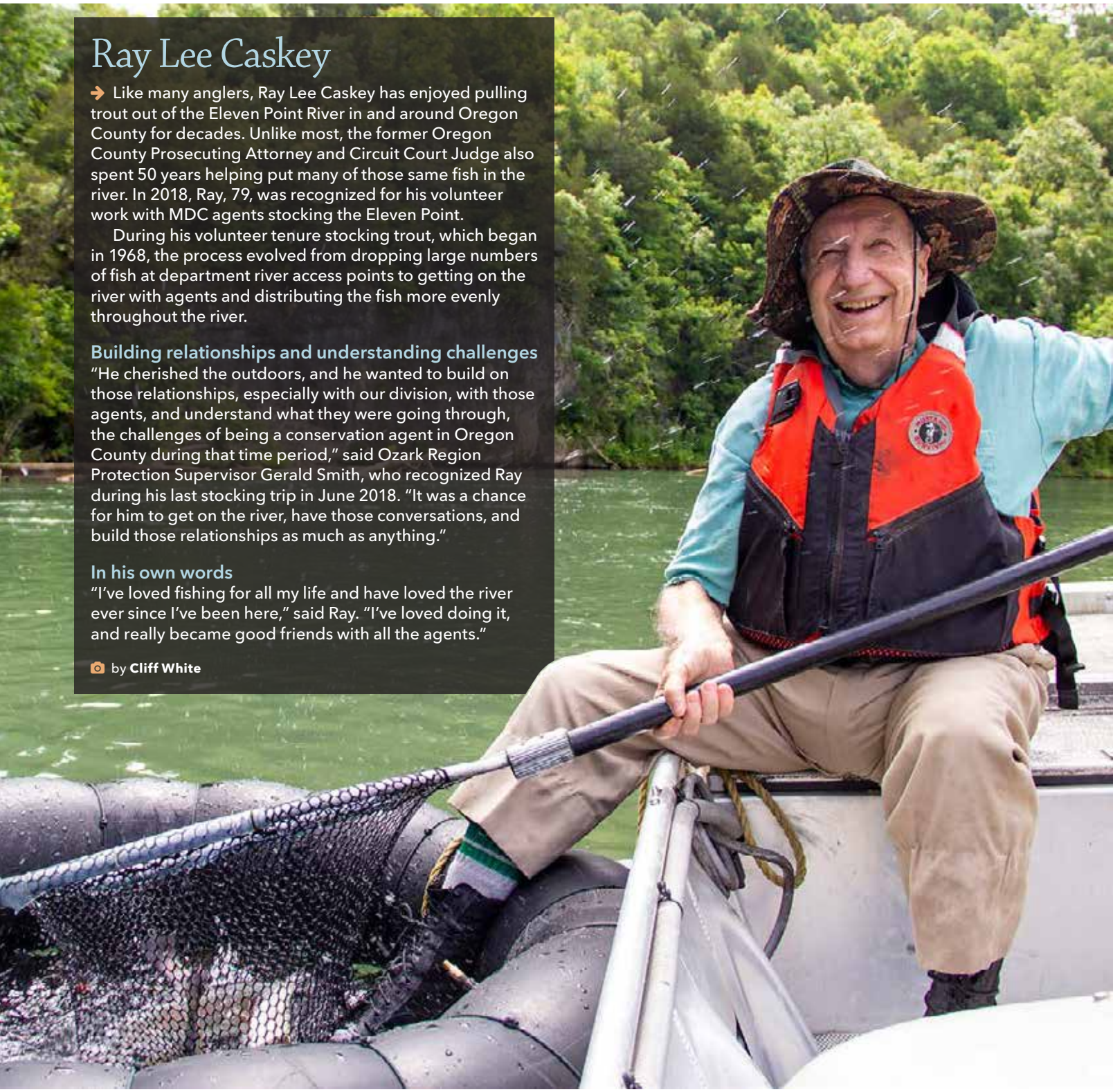
Kyle Clinton
CRAWFORD COUNTY CONSERVATION AGENT
offers this month's

AGENT ADVICE

Looking for summertime fun? Visit one of MDC's conservation areas. With so many outdoor opportunities waiting to be discovered, conservation areas are a great way to connect with nature. Whether you have enjoyed an area before or you are exploring a new area, be sure to download the free MO Outdoors app before you go. The app, available through Google Play for Android devices or the App Store for Apple devices, provides easy access to area information, activities, maps, hours, directions, and a contact number for additional information. As always, plan your trip ahead of time, bring plenty of water, tell someone where you are going and for how long, and have the proper permits if your activities require them.

WE ARE CONSERVATION

Spotlight on people and partners



Ray Lee Caskey

Like many anglers, Ray Lee Caskey has enjoyed pulling trout out of the Eleven Point River in and around Oregon County for decades. Unlike most, the former Oregon County Prosecuting Attorney and Circuit Court Judge also spent 50 years helping put many of those same fish in the river. In 2018, Ray, 79, was recognized for his volunteer work with MDC agents stocking the Eleven Point.

During his volunteer tenure stocking trout, which began in 1968, the process evolved from dropping large numbers of fish at department river access points to getting on the river with agents and distributing the fish more evenly throughout the river.

Building relationships and understanding challenges

"He cherished the outdoors, and he wanted to build on those relationships, especially with our division, with those agents, and understand what they were going through, the challenges of being a conservation agent in Oregon County during that time period," said Ozark Region Protection Supervisor Gerald Smith, who recognized Ray during his last stocking trip in June 2018. "It was a chance for him to get on the river, have those conversations, and build those relationships as much as anything."

In his own words

"I've loved fishing for all my life and have loved the river ever since I've been here," said Ray. "I've loved doing it, and really became good friends with all the agents."

by **Cliff White**

What's your conservation superpower?

Clinton E. Trammel: May 30, 1940–June 21, 2018

TRAMMEL INDUCTED INTO CONSERVATION HALL OF FAME

MDC and the Conservation Commission honored Pioneer Forest's longtime Forest Manager Clint Trammel posthumously by inducting him into the Missouri Conservation Hall of Fame. The award was presented to Trammel's family during a ceremony at Pioneer Forest's annual community barbecue in Salem in April. The privately owned, 143,000-acre Pioneer Forest is in the heart of the Missouri Ozarks.

Trammel died June 21, 2018, at the age of 78, following a lifelong passion for and career in forestry. With the addition of Trammel, the Conservation Hall of Fame honors 44 Missourians posthumously who have made substantial and lasting contributions to forestry, fisheries, and wildlife conservation efforts in the state. Learn more at **short.mdc.mo.gov/Zxn**.

GRANT WOODS RECEIVES MASTER CONSERVATIONIST AWARD

Congratulations to Grant Woods, Ph.D., of Reeds Spring on becoming the 61st recipient of our Master Conservationist award, which was first presented in 1942. Dr. Woods received the award at the May 23 commission meeting at Big Cedar Lodge near Branson.

Dr. Woods is a wildlife biologist who is nationally known and respected as a leading authority on deer management, research, and education. He is also a strong proponent of hunting as a vital tie to wildlife conservation.

"Dr. Woods exemplifies Missouri's Show-Me spirit through his comprehensive wildlife-management philosophy, strong conservation ethic, and love for wildlife," said MDC Director Sara Parker Pauley, who presented the award. "He is so very well deserving of the award because of his decades of dedication to white-tailed deer, habitat management, environmental and conservation education, and the continuation of our rich hunting heritage."

The Master Conservationist Award honors living or deceased citizen conservationists, former MDC commissioners, and employees of conservation-related agencies, universities, or organizations who have made substantial and lasting contributions to the state's fisheries, forestry, or wildlife resources, including conservation law enforcement and conservation education-related activities. Learn more at **short.mdc.mo.gov/Zxh**.

The Missouri Conservation Commission and MDC bestowed their Master Conservationist award in May to Grant Woods, Ph.D., of Reeds Spring. Pictured L-R: Commissioners Barry Orscheln and Marilynn Bradford, Dr. Grant Woods, Commissioner David Murphy, and MDC Director Sara Parker Pauley.

WHAT IS IT?

RUBY-THROATED HUMMINGBIRD

The ruby-throated hummingbird (*Archilochus colubris*) uses its needlelike bill to extract nectar from feeders and flowers. This tiny bird also dines on insects. The ruby-throated hummingbird frequents forests and other wooded places where it builds nests from spider webbing and plant materials. Watch for a peak in hummer numbers in August as they migrate through Missouri.

HUMMINGBIRD: NOPPADOL PAOTHONG

HELPING LANDOWNERS *protect* MISSOURI'S RARE PLACES AND SPECIES

PARTNERSHIPS AND FUNDING KEY TO MEETING UNIQUE ECOLOGICAL CHALLENGES

by Bill Graham

A male prairie-chicken performs a mating dance in early spring. Private landowners in the Grand River Grasslands use MDC expertise and federal RCPP cost-share assistance to help protect this endangered species and diversify or improve cattle forage.

PHOTOGRAPH BY NOPPADOL PAOTHONG

Eastern collared lizards prance atop granite boulders on sunny days in southeastern Missouri glades, while in the state's northwest corner, prairie-chickens peck for bugs and hide from predators beneath grasses and wildflowers growing on deep soil.

While geography separates these unique species, conservation gives them something in common. Prairie-chickens are endangered and eastern collared lizards are a species of conservation concern. But MDC's partnerships with private landowners for habitat improvements have expanded the supportive range for both species. Their success or failure signals the prospects for many other prairie- or glade-dwelling plants and animals, too.

Without projects that keep unique habitats, such as rocky glades, in their natural states, "there are several adapted species that won't thrive," said Julie Norris, MDC private land conservationist in St. Francois and Iron counties. "One species that comes to mind is the collared lizard. It doesn't live anywhere but in these glade communities. There's a lot of sun-loving plants we wouldn't see, and unique species like the glade grasshopper."

MDC, in partnership with the USDA's Natural Resource Conservation Service (NRCS), assists people who own property with the potential to provide important wildlife habitat. The federal agency offers cost-share opportunities to states under the Regional Conservation Partnership Program (RCPP) for land management improvements that can help wildlife, and in some cases farm profitability. MDC provides expertise to help landowners plan and implement improvements. The RCPP program pays for expenses, such as native grass seed purchases, hiring contractors to remove unwanted trees, or conducting prescribed burns. Sometimes a landowner plan includes MDC's Landowner Assistance Program funds or money from other USDA programs that add to habitat benefits.

Under the RCPP grants, landowners receive assistance with habitat improvements that help all wildlife but also specifically benefit species that are endangered, rare, or dwindling. Programs can be tailored to fit a property owner's goals and the specific habitat needs. Owners have two or three years to complete the practices, so work can be done in stages as needed.

Some landowners initially seek better deer and turkey habitat, "but then they discover the value of restoring habitat for the outlying species, too," said Roger Frazier, MDC priority habitat coordinator.

Habitat Improvements for Your Land

MDC's private land conservationists can connect property owners with a variety of state and federal cost-share programs that provide financial assistance for habitat enhancement or restoration for grasslands, woodlands, forests, and streams. For more information, call your local MDC office or visit **mdc.mo.gov/property**.

Restoring Glades Among the Granite

The granite boulders and outcrops topping hills in the St. Francois Knobs region originated as volcanic eruptions almost 1.5 billion years ago. The weathering of rock and accumulated dust and organic matter over millenniums left thin soils in cracks, crevices, and on terraces where unique plants grow on hilltops or hillside glades. Further down the slopes, deeper soils support trees, originally growing in scattered patterns alongside native grasses and wildflowers. Eastern collared lizards prefer life among the stones. Deer and turkeys like the open woodlands. Historically, wildfire kept trees and shrubs from dominating the glades and woodlands, preserving the plant diversity that helps wildlife.

Human settlement in the 1800s changed the ecological pattern by suppressing fire. This allowed red cedar trees to invade the glades in thick groves. Red cedars are native and have their benefits for people and wildlife. But they can be harmfully invasive to glades and prairies by hoarding moisture and blocking sunlight, thus choking out other species.

To restore balance, MDC connects landowners with RCPP financial assistance from NRCS under the Restoring Glade and Woodland Communities for Threatened Species program. Landowners in Carter, Iron, Madison, Reynolds, Ripley, Shannon, Ste. Genevieve, St. Francois, and Wayne counties were eligible for RCPP assistance for habitat improvement projects. The glade and woodland program also addressed karst habitat needs in Perry County.

Eastern collared lizards will repopulate areas with large rocks for them to hide under.

COLLARED LIZARD: JIM RATHERT; O'BRIEN PRESCRIBED BURN: DAVID STONNER

Landowner Terry O'Brien (left) saw wildlife and wildflowers increase at his St. Francois County farm when he used RCPP cost share to restore glade and woodland habitat, including this prescribed burn conducted by contractor Brian Towe.

Putting Grants to Work

Norris studied aerial photos and habitat maps for St. Francois County to find potential glade restoration sites. She left flyers about the RCPP program in mailboxes. Her phone soon began ringing.

Terry O'Brien sought help for about 160 acres, mostly woodland, and 15 acres of glades at his Shanahill Farm near Park Hills. Norris helped him receive RCPP cost-share money to pay contractors to cut cedar trees off the glades, conduct prescribed burns, and thin trees in the woodlands. Plus, he's planning a wildflower plot with financial assistance from a separate program to benefit pollinators, like bees and butterflies. He left several dogwood and redbud trees uncut among the oaks and watches them bloom in spring. Native warm-season prairie grasses, like big bluestem, appear in summer. A native plant seed bank lingering in the soil from before the cedar invasion came to life when trees were cut and leaf litter burned away.

"It looks great, unbelievably great, a remarkable improvement," O'Brien said. "It's remarkable what prescribed burning can do. The wildflowers have come back. There are different flowers that I've never seen before. It's opened up and the view improved immensely."

He never saw eastern collared lizards on his glades before the cedars were removed. The lizards will not move to an overgrown glade. But they will repopulate areas with large rocks for them to hide under and where renewed grasses and wildflowers support insects for them to eat.

"It's remarkable what prescribed burning can do. There are different flowers that I've never seen before."

—Terry O'Brien
landowner

"They're everywhere now," O'Brien said of the foot-long lizards with assorted tan, lime-green, and orange colors. "They're fabulous little guys."

For Wildlife and Wildflowers

Ken Allen of Farmington witnessed a surge in wildlife and wildflowers on his small acreage after getting assistance through the RCPP program. Norris visited the farm, and they laid out a plan for changes to the overcrowded woodland with rocky patches.

"There's a lot of granite out here," Allen said.

Under the program, a contractor built fire lanes. Timber was thinned and cedar trees were removed. A small pond to provide water for wildlife was built. A contractor conducted a prescribed burn. Costs for habitat work vary according to practices, contractor prices, and acreages treated. The percentage of costs covered can vary but can range up to 90 percent paid by RCPP. For Allen, the RCPP program provided $14,000 for improvements on 30 acres, and he paid $2,000. The fire lanes he now maintains also double as hiking trails.

"The wildflowers sprang up, and grasses came up we'd never seen before," Allen said. "Doves have moved in. We've noticed the rabbit population increased."

Deer and wild turkeys also seem more numerous, he said. At night, they sit on their front porch and listen to frogs croaking in the pond. The changes required extensive tree thinning to open the tree canopy. Norris helped them pick what trees to take and which to leave.

"My wife was not totally on board," Allen said. "She was upset that we were taking her forest and she was afraid the wildlife might not come back. But she's really happy with the outcome now."

Their project, however, is contributing to a far broader wildlife boost in the St. Francois Knobs. The Allen farm is near six other properties where landowners have signed up for RCPP or MDC's Landowner Assistance program to restore open glades and woodlands. One neighbor completed cedar removal from 7 acres of glades and hosted a 40-acre prescribed burn. Eastern collared lizards soon increased in the newly opened habitat.

"This is a neat representation of how smaller acreage landowners are able to do work that can potentially get big results over time by working on farms that are in close proximity," Norris said.

Helping Prairie-Chickens Make a Stand

The Wisconsin glacier pushing south and then receding 20,000 to 14,000 years ago, along with wind-blown silt from glacial melt, created a loess soil base that lush prairies and woodlands eventually covered in loamy, nutrient-rich topsoil in northwest Missouri. That soil now produces cattle and crops that help feed the world. But in the rolling hills of Harrison and neighboring counties, remnant or restored native grasslands are also a last stronghold for endangered prairie-chickens in Missouri.

MDC connects ranchers in the area with RCPP projects, a key component in helping one of the state's last prairie-chicken flocks survive. Statewide, funds from the NRCS Regional Grassland Bird and Grazing Land Enhancement Initiative are authorized for parts of 40 counties in Missouri's cattle country. But that program is especially important in helping property owners improve prairie-chicken habitat in MDC's Grand River Grasslands priority geography.

Less than one-tenth of one percent of Missouri's original prairie remains in scattered remnants, and prairie-chickens have dwindled to less than 50 birds in two widely separate flocks. This spring, 33 of those birds were counted in Harrison County. Most were on The Nature Conservancy's Dunn Ranch Prairie, their established haven in the heart of the Grand River Grasslands.

But Kendall Coleman, MDC private lands conservationist, also found prairie-chickens this spring using a lek, or mating ground, on a private farm. The RCPP program has paid for tree cutting and native grass establishment in that area. In the past, biologists have tracked nesting and broods being raised on a cooperator's land.

"Smaller acreage landowners are able to do work that can potentially get big results over time."

—Julie Norris
MDC private land conservationist

"It makes me feel a little better about prairie-chickens, that this might actually work for them," Coleman said.

He's currently working with 26 landowners who are planning or have implemented improvements. Coleman developed an innovative RCPP program for his area that increases the percentage of cost-share assistance when landowners add conservation practices to their project. They can receive up to 90 percent cost-share match if they take a holistic approach that incorporates all four practices of tree or brush removal, planting native warm-season grasses, protecting streams, and resting pastures. Not all practices fit each farm. But for example, cost share provides $358 per acre for native grass establishment, or $680 when all four practices are used. Conservation practices must meet NRCS standards. But the program has flexibility to be an affordable way to meet a landowner's goals and help wildlife. That flexibility includes a few years to complete the changes.

Mingling Prairie-Chickens With Cattle

Rancher Robin Frank of Eagleville is happy to help wildlife on his pastures near Dunn Ranch. But his business is raising and grazing cattle, and he likes that enhancing grasslands has helped his ranch's profitability. The conception rate for his cows producing calves went up when he began letting them graze in late summer on native warm-season grasses. RCPP financial assistance helped him with the cost of replacing fescue with native grasses in those pastures.

JULIE NORRIS: DAVID STONNER; PRAIRIE CHICKEN, FRANK FARM: NOPPADOL PAOTHONG

Rancher Robin Frank used RCPP funds to remove unwanted trees from pastures, such as this pile of cedar trees, improving his forage for cattle.

"The conception rates are 10, 15, or even 20 percent better on native grass," Frank said. "They just do better on that warm-season grass."

The Frank family has also used the RCPP or related programs to clear unwanted trees. Those trees inhibit prairie-chicken movement across the landscape, but they also shade out grass. One example is a program that helped pay a contractor to clear one hillside acreage that was totally brush covered.

"The net result for me was we have more open land for grazing cattle, which is what we do," Frank said. "The net cost to me was $100."

Coleman has helped Frank install two gravel stream crossings and fence cattle away from an upland creek. Protecting aquatic species, such as endangered Topeka shiners reintroduced to the Grand River Grasslands, is among the objectives. The Franks plan to convert more nonnative fescue to native warm-season prairie grasses. Biologists studying grassland bird populations have noticed good numbers of songbirds, such as bobolinks, meadowlarks, and grasshopper sparrows, on the Frank farm. Those birds are in a decline in many regions. What helps the prairie-chicken helps other birds, too.

The ranch currently doesn't host a spring lek, Frank said, "but we see prairie-chickens on our place all the time."

Other landowners in the area are utilizing similar programs to restore grassland ecological functions, which is what prairie-chickens and other prairie species need — several thousand acres with supportive grasslands that are interconnected across the landscape.

MDC expertise and programs like RCPP are making habitat work affordable and effective.

"The incentives interest landowners in doing things that have been overlooked in the past," Coleman said. "Our ultimate hope is that they like it, that it's profitable. We're wanting this to be a partnership that's mutually beneficial for landowners and wildlife." ▲

Bill Graham is an MDC media specialist for Kansas City and Northwest regions. He's a lifelong hunter, angler, and camper. He also enjoys hiking and photographing Missouri's best wild places.

Tom and Cathy Aley share a laugh inside Tumbling Creek Cave's natural entrance.

Tom and Cathy Aley have spent their lives advancing karst studies and securing the future of Tumbling Creek Cave

A Force for Nature

by Bonnie Chasteen • photographs by David Stonner

"Do you think it could have been a short-faced bear?"

In the light of our headlamps, we saw two sets of deep claw marks on the cave wall, maybe 2 yards apart.

Tom Aley considered his answer.

Eleven thousand years ago, the short-faced bear was the most common ursid in North America. It was also enormous, possibly the largest meat-eating land mammal that ever lived. A big one weighed nearly a ton and stood 6 feet high at the shoulder, able to look a tall man like Tom right in the eye. It's not hard to imagine the big bears holing up here in Tumbling Creek Cave, formerly known as Bear Cave.

"It could have been a short-faced bear," Tom says. "But I think it was a black bear."

Tom's wife, Cathy, a tall person herself, shot him a look. For nearly 50 years, they've led field trips through this cave, which they own, and they've no doubt had a version of this conversation more times than either of them can remember.

"Oh," she says, "I didn't know you'd decided that." They laugh.

The Aleys are both scientists. He's a longtime cave enthusiast and a forester-turned-hydrologist. She's a limnologist, someone who studies the ecological systems of freshwater lakes and other inland waterways. As fellow scientists and business partners, they are collaborative and mutually supportive. And, like most long-married couples, they keep each other honest.

Each is a force of nature, and together they're a force for nature, especially the part most people don't often see — a mostly hidden landform known as karst.

Characterized by underground drainage systems with caves and sinkholes, karst develops in limestone and other soluble bedrock. It occurs on every continent on Earth except Antarctica, and it receives, stores, and releases vital groundwater. It also serves as essential habitat for some of Earth's rarest and most endangered lifeforms, like the federally endangered Tumbling Creek cavesnail. Studying karst systems, figuring out how to trace them, educating people about them, and protecting them has been the Aleys' vocation and avocation since Cathy joined Tom at his Ozark Underground Lab (OUL) in 1974.

A lot has been written, in the *Conservationist* and elsewhere, about Tumbling Creek Cave, the most biologically diverse cave west of the Mississippi, and efforts to save its endemic cavesnail from extinction. But this story is about the Aleys, their influence on karst conservation efforts worldwide, and what they're doing to ensure their legacy endures long after they've hung up their headlamps for the last time.

A Global Village

Famous for his sense of humor, Tom likes to quip that Cathy does all the work, and he gets all the credit. But he's serious about recognizing the many people who have helped them develop their campus and groundwater-tracing business and conduct field trips over the years.

Family, professors, teachers, scientists, and caving enthusiasts — even the real estate agent who sold Tom the cave in 1966 — became part of the Aleys' extended clan. Cavers produced a detailed map of the cave, and many taxonomists identified the cave's species, describing and naming three new ones. Cavers and MDC staff volunteered to build the massive bat gate at the cave's natural entrance.

"It has taken a village, and we greatly appreciate all the villagers who have joined with us," Tom said. "Great conservation efforts require a lot of people and a lot of effort."

To run their underground lab, they employ nine people. Using Tumbling Creek Cave to test their groundwater-tracing methods, the Aleys developed strategies for dealing with large volumes of water and "doing it with very small amounts of dye," Tom said. "This led to a lot of consulting and tracing work, which we do all over the world."

MDC Stream Program Coordinator Paul Blanchard contracted services from OUL, and he recognizes the Aleys' role in advancing dye-tracing techniques.

"One of the most fundamental aspects of hydrology is understanding how the system is connected both above and below the ground," he said. "Hydrologists add dye as a tracer to determine if two points are, in fact, connected. Tom worked hard at improving this method and instituted many procedures that have become standard practice now.

"The U.S. Forest Service, National Park Service, and MDC have all contracted with the Aleys for conducting dye traces

The Big Room of Tumbling Creek Cave is 60 feet high, and the floor lies 170 feet below the surface.

DYE TRACING COURTESY TOM ALEY

Tom Aley uses a special dye to trace the flow of creek water through the porous karst landscape.

Ozark Underground Lab technicians chart the test results of water samples sent from karst regions around the world.

related to critically important springs, caves, streams, and their dependent biota," Blanchard said.

The Aleys see their business and their outreach efforts as mutually supportive. "All the company's income over the years has gone into supporting the cave's conservation needs," Tom said.

A New View of Endangered Species

One of the many villagers the Aleys attracted to their operation is Dr. David Ashley. He was teaching biology at Missouri Western State University in the early 1990s when he took his first cave biology class down to Protem for an OUL field trip.

"The trip was such an incredible success," Ashley said. "Everything Tom talked about related to our cave biology class, but it was all new to me. It was such a major learning experience."

Ashley became a regular visitor, bringing student groups to the cave on an annual basis. When the Aleys noticed a sharp dip in their cavesnail numbers in the mid-1990s, the U.S. Fish and Wildlife Service (USFWS) asked Ashley to collect data to determine what was happening. His monitoring confirmed their observations.

"In the mid-1970s, we knew we had a population of about 15,000," Tom said. "By 2000, the population had dropped to 150."

In 2002, USFWS listed the Tumbling Creek cavesnail as endangered. Although the Aleys were distressed about the cavesnail's downturn, they viewed the listing as a blessing. With it came funding and support to help find and fix the problems that were driving the snail's decline: erosion from overgrazing, sewage from a local school, and the invading native ringed crayfish from Bull Shoals Lake.

Tom said they've done very well by managing the cavesnail and its listing as an asset, not a liability. "The community has done well," he said. With a new sewer system, "the school is still there serving the neighborhood."

Studying the Surface

The Aleys lead field trippers into the cave to reveal what happens when land is mismanaged.

"We've taken about 40,000 people on our daylong trips to help them better understand interactions between the surface and subsurface in cave country," Tom said, "Most have been college students."

Field trips begin on land known as the recharge area that lies over the cave. According to OUL's flow records, about 50 percent of all the runoff water from this 9-square-mile area sinks into the ground and ultimately flows through Tumbling Creek Cave.

When Tom first bought the cave, he didn't own much of the recharge area's 5,800 acres. But after the cavesnail's decline pointed to problems like sedimentation from overgrazed land, he and Cathy started buying up recharge-area acres.

To date, the Aleys have bought and restored more than 3,500 acres of land. Restoration activities included stabilizing stream banks, repairing erosion gullies, and planting 75,000 trees.

The Aleys' Conservation Timeline

1966 Tom buys Tumbling Creek Cave to establish the Ozark Underground Laboratory (OUL) and research field station

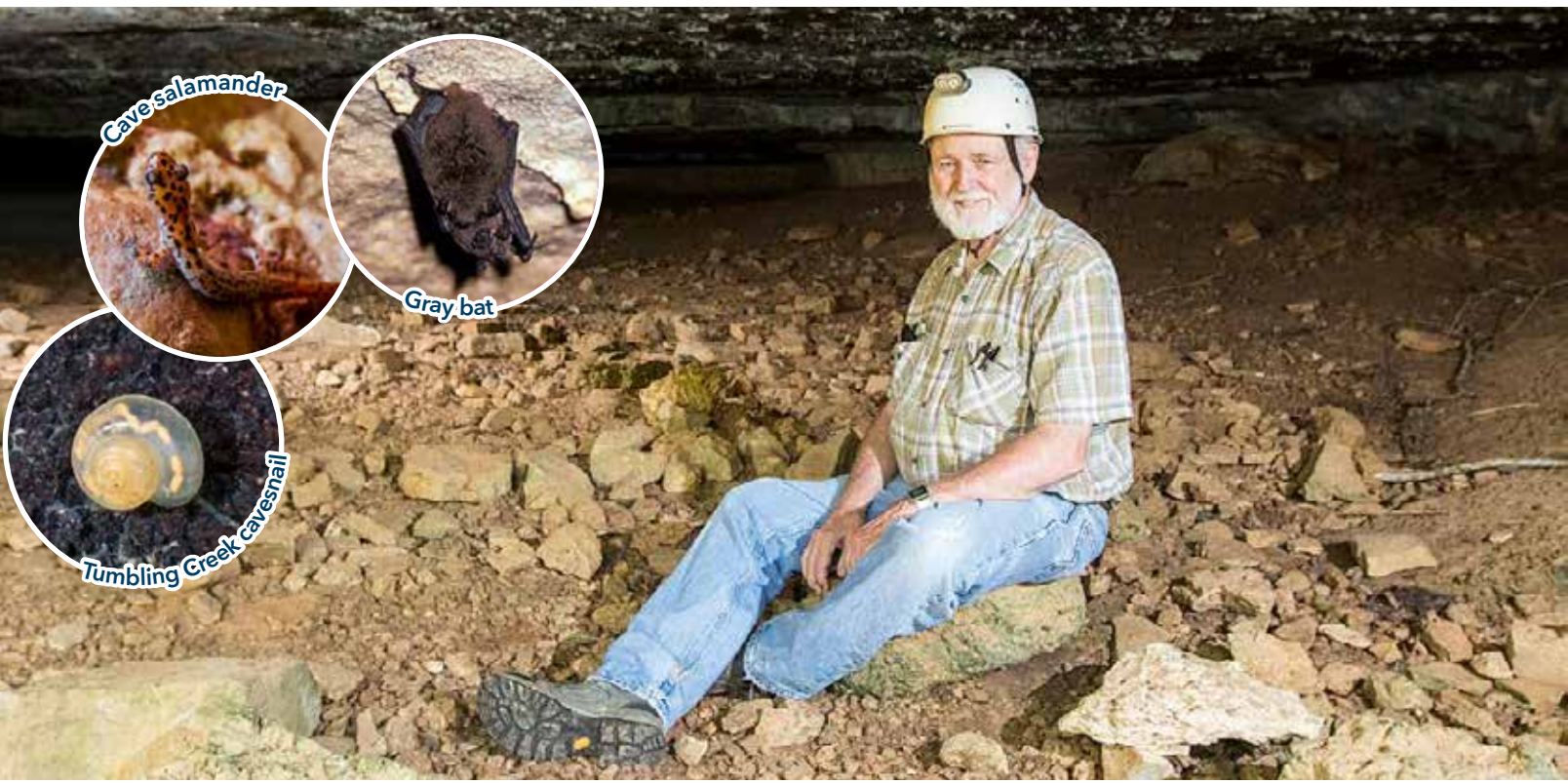
1967 Local real estate agent, Deb Walley, discovers the cavesnail while helping build the cave trail

1973 Cavesnail population estimated at 15,000

1974 Cathy accepts field biologist job with OUL

Cathy and Tom Aley enjoy identifying plants, like this *Palafoxia callosa*, that have reappeared on their restored prairie.

Tom Aley awaits the evening flight of gray bats. More than 40,000 gray bats, a federally endangered species, spend the summer in Tumbling Creek Cave.



1975
Tom and Cathy marry

1981
With 115 identified cave species, Tumbling Creek Cave becomes a National Natural Landmark

1996
Missouri Western State University biology professor Dr. David Ashley starts monitoring the cavesnail

2001
The Tumbling Creek Cavesnail Working Group forms

2002
Monitoring finds no snails in survey area; USFWS adds cavesnail to endangered species list

When I visited the Aleys' prairie and pastureland last September, Cathy told of degraded pastures and erosion gullies with cattle bones. But with their careful restoration, the late summer prairie was abloom with tall grasses and wildflowers, and it buzzed with bees, butterflies, and countless other species of pollinators.

Cathy and Tom credit renowned malacologist Ron Oesch, who died in 2012, with helping restore their prairie. Although an expert on snails, Oesch's prairie work focused on sowing the seeds of recovery.

"Ron would scatter native plant seeds on the bare spots where he had removed invasive thistles and other weeds," Tom said.

"And he identified so many land snails," Cathy said, "that we were afraid to walk out the front door for fear of crushing some of the beautiful things."

Past field trippers said they were impressed with the Aleys' restoration work. Leah Swindler is a graduate of MWSU, one of Ashley's former students. She recalled her first visit to the Aleys' prairie.

"Tom explained the arduous process that they had to go through with overgrazing impacting the watershed," she said. "I really loved what they were doing there, and I would love to do something like that."

Cathy points out that they now permit rest-rotation grazing on 1,300 acres of their prairie and pastureland. This benefits a local cattle owner and helps maintain the prairie's natural community.

With rest-rotation grazing, cattle are allowed only on small areas of the land for short periods of time, then they are moved so the native grasses and wildflowers can recover, she said.

Exploring the Cave

Most field trippers enter Tumbling Creek Cave through an entrance that is enclosed — almost armored — and locked.

"It keeps out vandals and wildlife, but it provides relatively easy access to field trippers," Tom said.

We ducked our heads to descend narrow, twisting stairs. Once on the cave floor, we followed the cemented pathway. Our headlamps revealed speleothems, "cave decorations," as Cathy calls them, eternally dripping from the ceiling, rising up from the floor, or appearing to bubble up from various surfaces.

We passed through large chambers, some flowing with water. When we got to the chamber where Ashley and his students have laid ceramic tiles to help with cavesnail monitoring, Tom reached into the water and picked one up.

"Nope," he said. "I don't see any today."

One of the students Ashley trained to help with monitoring was MWSU invertebrate zoology student Shannon Brewer. She's now Dr. Brewer, an assistant professor at Oklahoma State University in the Department of Natural Resources Ecology and Management. Her experience with monitoring and learning from the Aleys left a big impression.

"Tom has always been receptive to helping students," she said. "He's been like that in my career at OSU, too. I called him and said we need some recharge mapping. He said, 'I'm pretty busy right now, but I'll teach you.' Not many people are like that. I think his sense of person, in addition to his expertise and ability to tell a good story, make him pretty influential to students."

A Life With Purpose

"The Aleys live life with a purpose," said MDC Fisheries Biologist Dave Woods. "They have dedicated their lives and livelihoods to educate people about karst and to safeguard one of Missouri's most amazing natural features. To me, that is the ultimate example of living life with a purpose. They have had a bigger influence on my life than they will ever know."

A Lasting Legacy

Tom is 80 and Cathy is 70. Clearly, they have become conservation giants in the minds of their clients, peers, students, and friends. And while they're both still involved in daily operations, they're also keenly aware of the biggest threat to Tumbling Creek Cave — time.

To ensure that the cave, its recharge area, and its natural community have dedicated caretakers long after they're gone, the Aleys have established Tumbling Creek Cave Foundation. "Every thought and all our energy go into taking care of the cave and the animals in it," Cathy said. "The foundation will receive all our assets."

Ashley serves on the foundation's board of directors. "We intend to keep the focus on education activities that relate to karst resources," he said.

Board members, including retired USFWS ecologist Paul McKenzie, who wrote the rule for the cavesnail's emergency listing as well as its federal recovery plan, have expertise in geology, biology, and financial management.

"There's a lot that can be done in the future to help visiting groups experience a pristine glade habitat or a restored savanna, as well as the cave itself," Ashley said. ▲

Staff writer Bonnie Chasteen enjoys writing about nature and the people who protect it.

MONARCH, COLLARED LIZARD, SCISSOR-TAILED FLYCATCHER, CAVESNAIL: NOPPADOL PAOTHONG; GRAY BAT: JIM RATHERT

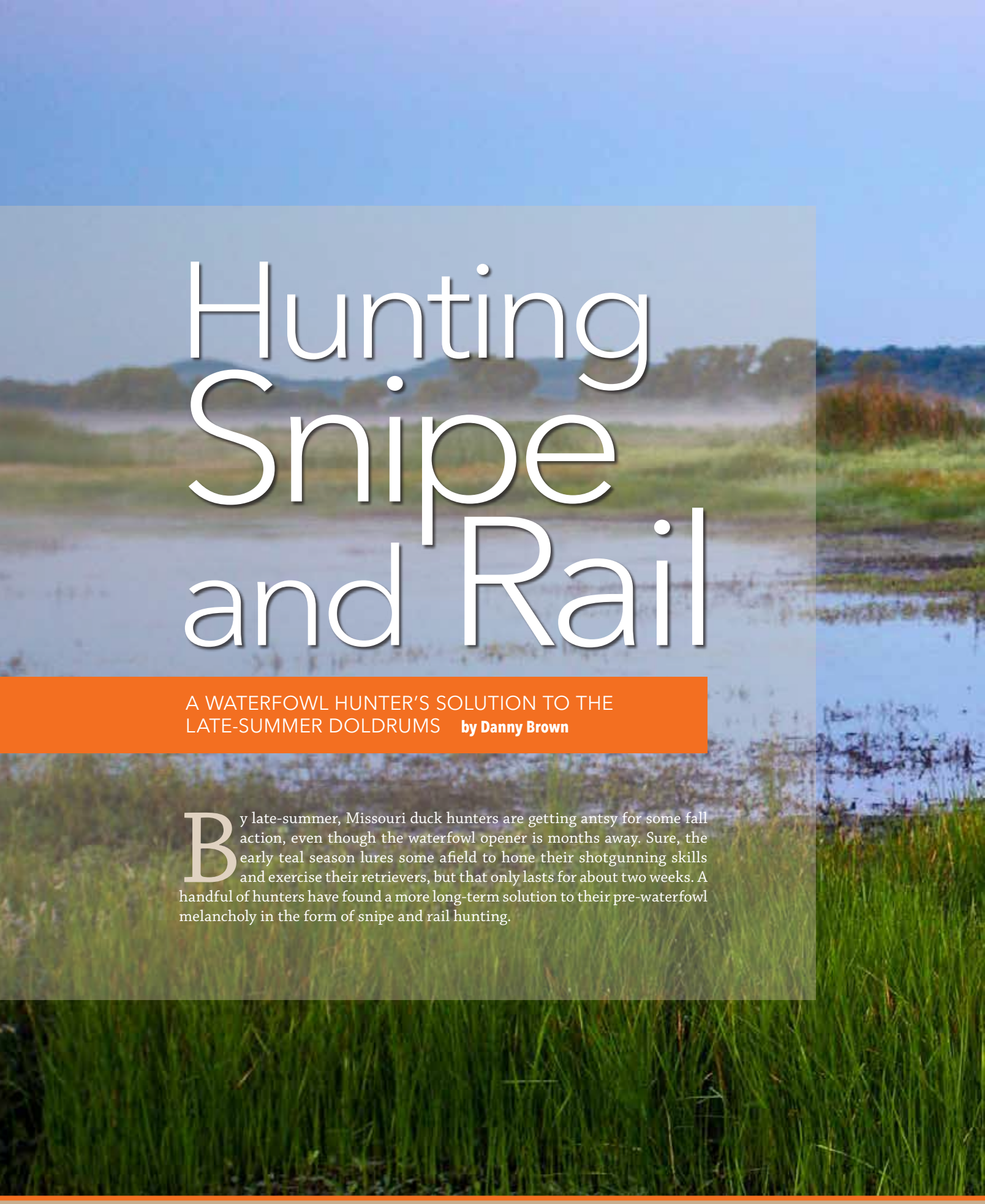
2003 USFWS approves cavesnail recovery plan

2004 Tumbling Creek Cave Foundation (TCCF) is established

2005–present TCCF and partners acquire and restore recharge area land and keep invasive ringed crayfish out of the cave

2017 May monitoring estimates 900 cavesnails in the survey area

2019 TCCF acquires 640 acres of prime forestland adjoining OUL property



Hunting Snipe and Rail

A WATERFOWL HUNTER'S SOLUTION TO THE LATE-SUMMER DOLDRUMS

by Danny Brown

By late-summer, Missouri duck hunters are getting antsy for some fall action, even though the waterfowl opener is months away. Sure, the early teal season lures some afield to hone their shotgunning skills and exercise their retrievers, but that only lasts for about two weeks. A handful of hunters have found a more long-term solution to their pre-waterfowl melancholy in the form of snipe and rail hunting.

Dave Mayers and his dog, Java, start the day early hunting snipe and rail.

Wilson's snipe

Sora

Virginia rail

Yes, the snipe, more specifically the Wilson's snipe, is an actual game bird, even though many think it's a mythical creature, hunted with a flashlight and a bag by gullible summer campers.

Many Missourians, including myself, have fallen victim to this practical joke, which goes all the way back to the mid-1800s. Sometimes, the make-believe snipe to be pursued isn't even a bird, but instead a furry critter from the imagination of the tormentor-in-charge.

This story is about a hunt for real snipe, those sneaky little marshland game birds that use superb camouflage and erratic flight patterns to elude the most experienced hunter. Any discussion of hunting snipe usually includes two other marsh birds, both rails — the sora and the Virginia rail.

Scoping the Quarry

Snipe

Wilson's snipe (*Gallinago delicata*), one of North America's most widespread shorebirds, is about the size of a killdeer but stouter, and with a very long bill. Although snipe are somewhat similar to other sandpipers, especially the dowitchers, they are easily identified by the stripes along their backs, striped heads, and barred flanks. Their distinct appearance, along with the scraip sound they make when flushed, is important to hunters because they are often found near other nongame shorebirds.

Snipe are most common in Missouri during their spring and fall migrations. They are found statewide during their migration. Hunters look for snipe in moist grassy areas, swamps, shallow marshes, or in drainage ditches. Many hunters seek snipe on the same MDC wetland areas where they hunt waterfowl.

Snipe forage mostly for larval aquatic insects like flies and beetles, but they will also take other invertebrates like earthworms, freshwater shrimp, and small crayfish if they encounter them.

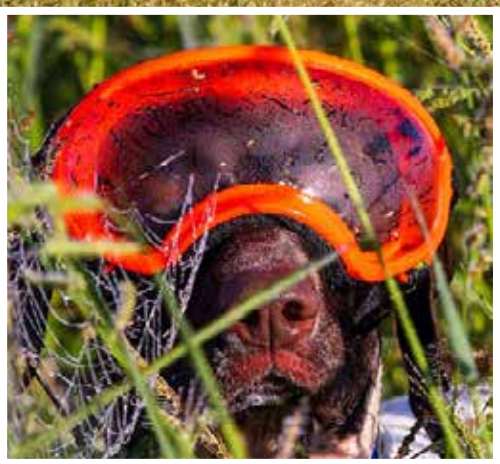
As they poke their bills repeatedly into the mud, probing for invertebrates, their bobbing heads look something like a sewing machine. Their bills have a sensitive, flexible tip that can open to grip food while the rest of the bill remains closed.

Snipe are often confused with American woodcock, a closely related species that has a similar shape and bill but different coloration and markings. Also, woodcock are typically found in wooded areas.

Snipe have a zig-zagging flight pattern when flushed, and this makes them a challenge to harvest. Worse, snipe often flush at a great distance because the position of their eyes allows them to detect predators from all directions. This includes hunting dogs, which can't get close enough to detect the birds by scent.

Sora and Rail

Sora (*Porzana carolina*) and the Virginia rail (*Rallus limicola*) typically visit Missouri during their spring and fall migrations. Both have statewide distribution, but the sora is more commonly found.



Lynn Schrader and Dave Mayers trudge through a dense stand of millet in search of secretive sora. Java wears canine goggles to protect her eyes from irritating millet seeds.

Adult sora have a stubby, yellow bill and black face. They are quite small, a few inches shorter than snipe. The cheeks and breast are gray, and the belly is barred black and white. The back is dark brown mixed with reddish tan and streaked with white. Immature birds are brown and lack the black face and chest.

Sora live in marshes, swamps, wet pastures, and flooded fields. Preferred habitats have dense vegetation flooded with shallow water. The sora's strong legs and long toes help it walk on floating vegetation and mud. Its body is compressed side-to-side, making it "thin as a rail," allowing it to slip easily among emergent marsh vegetation such as cattails.

Sora forage on seeds, snails, and aquatic invertebrates. Although seldom seen until they flush, sora are often heard. When entering a marsh, you're more likely to detect sora by listening for a variety of calls, including ker-wee or sor-ee, wheep, and quink-quink-quink.

The Virginia rail is less common than snipe and sora. Virginia rails have blackish backs with rusty wing patches and a gray face. The long, reddish bill is slightly curved, much different from the sora's short, yellow bill.

Rounding up the Hunters

When I asked my friend, Lynn Schrader, if he would take me on a snipe hunt, he paused for a few seconds to make sure I wasn't trying to be funny. Once he realized I was on the level, he gladly accepted. After I explained that I would be carrying a camera instead of a shotgun, Lynn suggested we ask our friend Dave Mayers to join us. Later that day, Mayers, an avid woodcock hunter who had never hunted snipe or rail, replied to my offer as expected: "Sounds fun — I'm in!"

Preparing for the Hunt

We made plans to hunt B.K. Leach Memorial Conservation Area (CA) in Lincoln County soon after the start of the season in early September. Lynn explained that the first hunt might

Don't Shoot King and Yellow Rails!

Hunters occasionally run across two other rails that are quite uncommon and protected from harvest in Missouri. These are the king rail (*Rallus elegans*), which is state endangered and much larger than other rails, and the tiny yellow rail (*Coturnicops noveboracensis*), which shows distinctive white wing patches when flushed.

King rail

KING RAIL: JIM RATHERT

Java retrieves her first sora of the day.

end up as a scouting trip because both snipe and rail are migratory, and their numbers would depend not only on weather conditions at the time of the hunt but moisture on the area as well.

Dave and I had a ton of questions about the hunt, but first and foremost for Dave was whether he should bring his pointing dog, Java. Lynn said that Java would be very helpful, at least for rail hunting, because it is extremely difficult to find a downed sora in dense, flooded vegetation without a dog. But there was a catch involving the preferred vegetation of rails at Leach CA — millet seeds!

Millet, an annual native at Leach, provides excellent cover and food for sora. Unfortunately, the same millet seeds that sora consume often become lodged under the eyelids of hunting dogs. After making two expensive visits to the veterinarian to extract pesky millet seeds from pups, Lynn was reluctant to invite Java along for the hunt.

Dave was initially crestfallen, but his mind quickly went to work, as usual. He would fit Java with goggles customized for canine use and get her used to wearing them a few weeks before the hunt.

Hunting Snipe and Rail

The morning of the hunt finally arrived, and Lynn and Dave began trudging through a field of flooded millet and smartweed at sunrise. Java was in the lead, buried somewhere in the thick vegetation.

It wasn't long before Java made her first point. A few seconds later, a bird flushed, and Dave bagged his first sora with his 20-gauge over-and-under. We took a moment for high-fives all around and continued our march.

It had been unseasonably warm and dry before the hunt, and we only saw one or two snipe all morning, both flushing at a great distance. At Leach, snipe are often found probing freshly disked, moist-soil areas for invertebrates. We covered all of the disked areas that we could find to no avail. Finally, Lynn and I began making plans to return after the next cold front with a good rain. The rest of the morning would be devoted to sora hunting.

By midmorning, the duo had harvested several sora, but we never saw a Virginia rail. Finally, steaming in the summerlike humidity, we decided to call it quits. Even Java's goggles fogged up at one point, but, otherwise, they had worked like a charm. We headed back to the truck, happy to have bagged some birds.

A few weeks later, a cold front with rain came during the night, so Lynn and I headed back out the next morning. Our plan was to walk a disked patch of cattails, about 5 acres in size and flooded with sheet water.

We began a few minutes after sunrise and immediately saw a group of six snipe flushing 100 yards out. It was as if they had materialized with the cold rain. We marked some of the singles and headed their way. Lynn missed the first bird, which flushed with the classic, erratic trajectory, apparently zigging just as Lynn's barrel zagged. The next two birds weren't as lucky.

Know the Seasons and Regulations

Missouri's snipe season typically runs more than three months. In 2019, opening day is Sept. 1, and the season closes Dec. 16. Hunters can pursue sora and Virginia rail from Sept. 1 through Nov. 9.

Remember, on conservation areas that have managed waterfowl hunts (such as B.K. Leach CA), hunting of wildlife other than waterfowl is prohibited, except in designated areas, from Oct. 15 through the prescribed waterfowl season.

Always consult the *Migratory Bird and Waterfowl Hunting Digest* for seasons, bag limits, and area requirements for nontoxic shot. Find it at **short.mdc.mo.gov/ZpP** or wherever hunting permits are sold.

By hunting a field of disked cattails and an adjacent stand of millet, Schrader harvests both snipe and sora.

Later, Lynn killed several sora as we skirted the millet and smartweed through which we had bushwhacked a few weeks earlier. After a couple more hours, we started back to the truck, happy to have both snipe and sora in the bag.

Managing Snipe and Rail in Missouri

Gary Calvert, wildlife management biologist and Leach CA manager, said he starts early when managing for snipe and rail, well before the teal season. Crews disturb about a third of the area by disking and mowing, and then flood those areas with sheet water for snipe, other shorebirds, and rail.

Typically, they disk areas in moist soil covered with perennial vegetation such as cattails, nut sedge, and bulrush. Disturbing those areas results in the production of native millet, smartweed, and other annuals that provide exceptional food and cover, especially for rails. Snipe frequent the freshly disked areas where they find plenty of moist mud to probe for invertebrates.

Each year brings its own set of challenges regarding weather and moisture, Calvert said. Timing is everything, and some years are better than others for snipe and rail hunting.

Getting Started

It's always wise to scout your wetland conservation area of choice before the season. Don't hesitate to contact the area manager for suggestions. Schrader recommends the shotgun gauge of your choice, loaded with No. 7 to No. 8 nontoxic shot.

When hunting rail, you'll need at least a pair of hip boots, but Schrader prefers chest waders to fend off the millet and smartweed seeds that find their way into anything shorter. If you are just hunting snipe, a pair of hip boots or even knee boots will suffice.

Cooking Your Harvest

Snipe have been described as tender and rich in flavor, best prepared medium-rare. I'm sure there are dozens of recipes for snipe, but as with most gamebirds, I prefer to just cook them on the grill over charcoal. Most hunters don't feel the need to marinate snipe beforehand as they often do with waterfowl. Finding interesting ways to prepare the snipe and rail you harvest will be a bonus to a satisfying outdoor experience.

Hunting snipe requires stamina and shooting skill, but the rewards are satisfying, in the field and at the table. ▲

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

Get Outside in JULY

Ways to connect with nature

Berry Picking

Blackberries are ripening. Gather your family and friends and plan a trip to the nearest blackberry patch. Better hurry! Birds and wildlife also enjoy these juicy, sweet wild fruits.

What's That? Up in the Trees!

Fall webworm caterpillars (*Hyphantria cunea*) begin building webs in trees. Walnut, hickory, pecan, persimmon, sweetgum, ash, maple, oak, poplar, redbud, and willow are most common targets. Though unsightly, these webs do not damage trees. Fall webworms have dozens of natural enemies to reduce populations. To assist these natural enemies, rip open easily accessible webs with a long stick to expose the caterpillars inside.

SOUTHWEST REGION

FISHING SKILLS: River Fishing—Bass

Saturday, July 13 • 9 a.m.–2 p.m.
Shoal Creek Conservation Education Center
201 W. Riviera Drive, Joplin, MO 64804
Registration required. Call 888-283-0364 by July 12.
All ages

Southwest Missouri offers lots of opportunities to fish and enjoy the outdoors. This river fishing clinic will focus on fishing for bass species in our local waterways. We will talk about locations to fish, strategies, equipment, rules and regulations, and how to catch different species of bass. We will meet at Shoal Creek Conservation Center and after the classroom portion, go down to Shoal Creek and fish. All students 16 and older must have a valid fishing license. All equipment will be provided, but you may bring your own.

DRAGONFLY LAYING EGGS: DONNA BRUNET; LARGEMOUTH BASS, CRAPPIE: LANCE MERRY

Natural Events to See This Month

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

Black-eyed Susans bloom

Young hummingbirds visit feeders

Young raccoons leave dens

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

OZARK REGION

Nature at Night

Thursday, July 25 • 8–9:30 p.m.
Twin Pines Conservation Education Center
Rt. 1, Box 1998, Winona, MO 65588
Registration required. Call 888-283-0364 or visit mdc.mo.gov/twinpines by July 20.
For more information, call 573-325-1381.
All ages

This program starts just before dark at Twin Pines, which is the best time to explore nature's "night shift." What is the "night shift?" It is more than owls and bats. Many animals are active only at night. Learn what you can expect to see and hear, then we will head out on the trail to enjoy the Missouri Ozarks after dark. Suitable shoes are recommended.

Fungus Among Us

Look for chanterelle mushrooms now through August. Though maybe not quite as well-known as morels, chanterelles are growing in popularity. Chanterelles are bright orange or yellow, although one, the black trumpet chanterelle, is blackish-brown. They are funnel- or trumpet-shaped, with wavy cap edges, and are found in the same places as morels. For more on Missouri's edible mushrooms, visit **short.mdc.mo.gov/ZNf**.

Fishing in the Dark

Beat the summer heat. Try night fishing for crappie. All you need is a flashlight, a pole, some bait, and a good fishing hole. Browse places to fish at **mdc.mo.gov/atlas**.

Dragonflies lay eggs in ponds, streams, and wetlands

Rattlesnakes hunt mostly at night

Conservation Nature Centers

Discover nature with us.

Cape Girardeau
2289 County Park Drive
Cape Girardeau, MO 63701
573-290-5218
mdc.mo.gov/capecnc

Runge
330 Commerce Drive
Jefferson City, MO 65109
573-526-5544
mdc.mo.gov/runge

Springfield
4601 S. Nature Center Way
Springfield, MO 65804
417-888-4237
mdc.mo.gov/springfieldcnc

Powder Valley
11715 Cragwold Road
Kirkwood, MO 63122
314-301-1500
mdc.mo.gov/powdervalley

Burr Oak Woods
1401 NW Park Road
Blue Springs, MO 64015
816-228-3766
mdc.mo.gov/burroakwoods

Twin Pines
Route 1, Box 1998
Winona, MO 65588
573-325-1381
mdc.mo.gov/twinpines

Discovery Center
4750 Troost Ave.
Kansas City, MO 64110
816-759-7300
mdc.mo.gov/discoverycenter

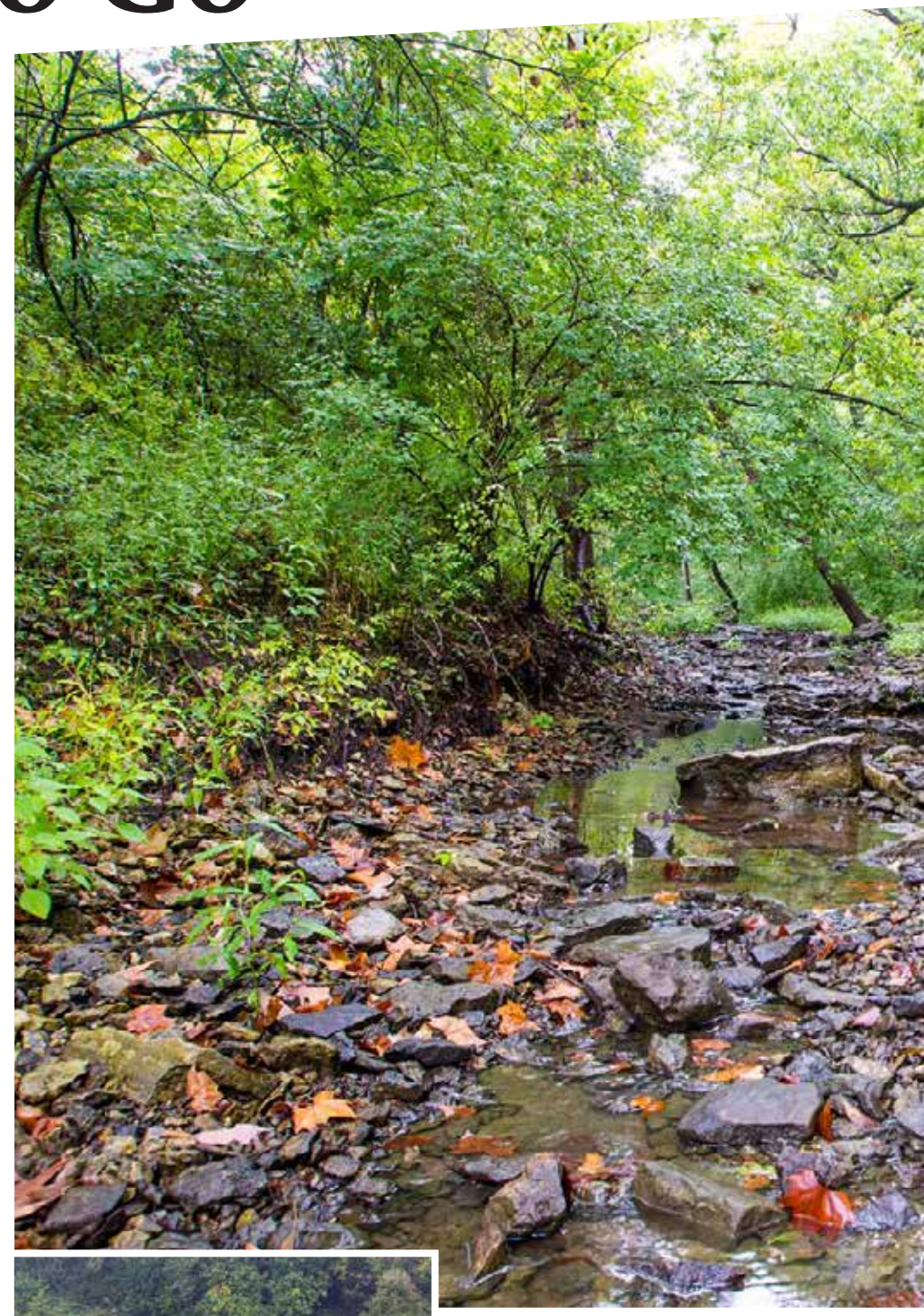
Places to Go

KANSAS CITY REGION

James A. Reed Memorial Wildlife Area

Fishing, hiking, biking, and more in suburban Kansas City

by Larry Archer



Residents of metropolitan areas tend to expect a wide range of options in dining, shopping, entertainment, and recreation. Fortunately for Kansas City area residents, James A. Reed Memorial Wildlife Area (WA) offers that diversity for those wishing to get outdoors.

Located on 3,084 acres south of Lee's Summit in Jackson County, Reed Memorial WA offers variety that should meet the needs of those looking for the outdoor experience.

Included in the landscape are 12 lakes, ranging from 1 to 42 acres, making the area a popular summer spot for casting a line, said Rick Bredesen, wildlife management biologist and Reed Memorial WA manager.

"Fishing is probably the number one activity for the area during this time period," Bredesen said.

With a trail network totaling nearly 20 miles, hikers, bicyclists, and equestrians can all find an opportunity to get outdoors, he said.

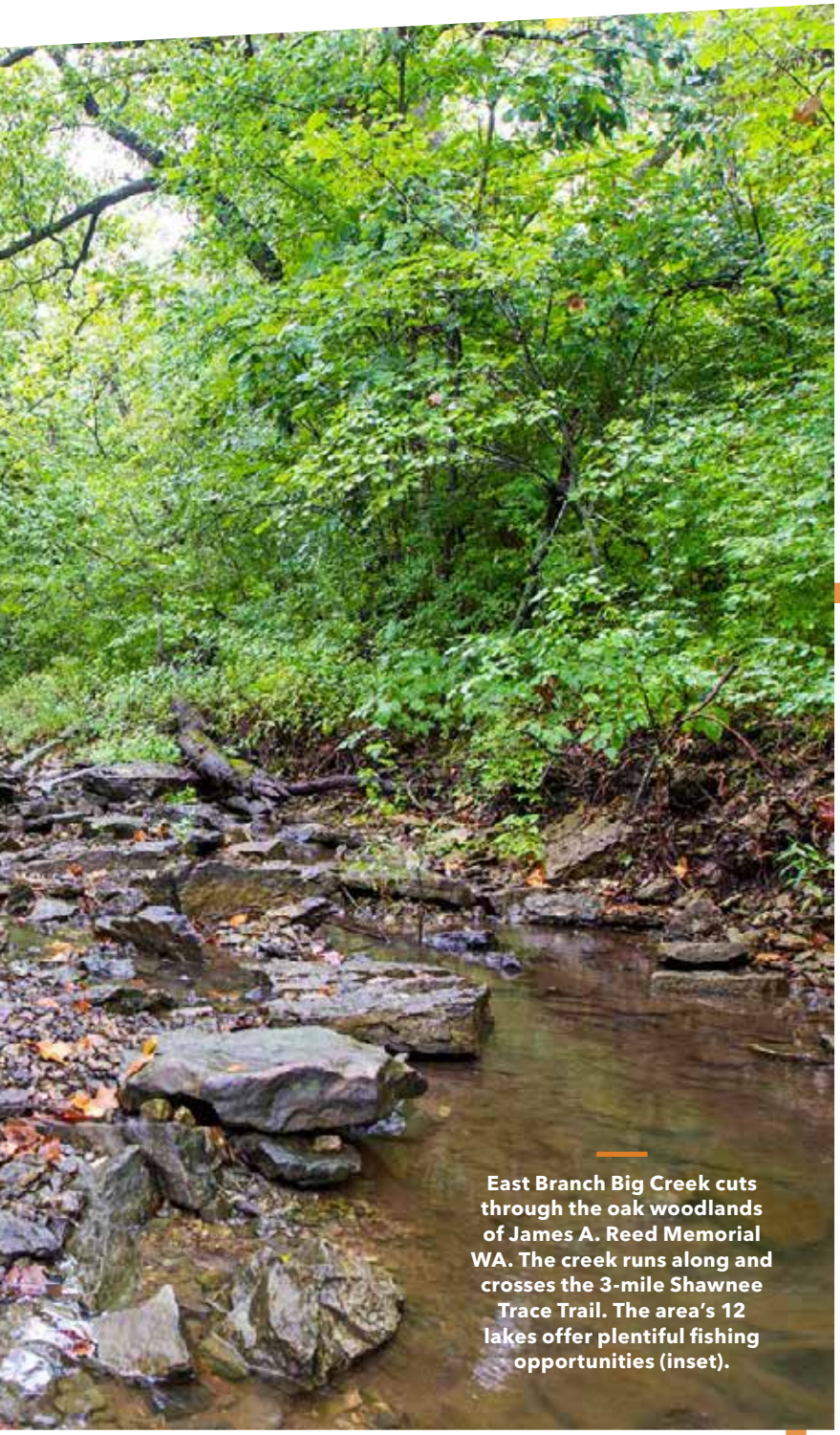
The majority of the fishing lakes are located in the northern two-thirds of the area, while the lower third is more reminiscent of the prairie grasslands that once covered much of the state, including many grassland bird species and a wildflower presence.

"Flowers are blooming in July," Bredesen said. "People come out to take pictures of them along with birds and butterflies that utilize those grassland areas."

DAVID STONNER

WHAT TO LOOK FOR WHEN YOU VISIT

Red-tailed hawk



East Branch Big Creek cuts through the oak woodlands of James A. Reed Memorial WA. The creek runs along and crosses the 3-mile Shawnee Trace Trail. The area's 12 lakes offer plentiful fishing opportunities (inset).

JAMES A. REED MEMORIAL WILDLIFE AREA

consists of 3,084 acres in Jackson County. From Lee's Summit, take Highway 50 east 1 mile, then SE Ranson Road (Route RA) south 0.75 mile to the area entrance.

N38° 53′ 26.16″ | W94° 20′ 25.44″

short.mdc.mo.gov/ZxU 816-622-0900

WHAT TO DO WHEN YOU VISIT

- **Bird-Watching** Included in the Great Missouri Birding Trail (**short.mdc.mo.gov/Zxw**). The eBird list of birds recorded at James A. Reed Memorial WA is available at **short.mdc.mo.gov/Zxi**.
- **Boat Rentals** Rentals available on Gopher Lake. Privately owned boats or other floating aids (belly boats, tubes, etc.) are not allowed.
- **Camping** Youth group only; special-use permit required.
- **Dog Training and Field Trials** Special-use permit required for field trials.
- **Fishing** Black bass, catfish, crappie, sunfish, and trout
- **Hunting** **Deer** by managed hunt
  Regulations are subject to annual changes. Please refer to the *Fall Deer and Turkey* booklet for current regulations.

  Also **dove**, **rabbit**, and **squirrel**
- **Shooting Range** 28-point walking archery course; six static targets.
- **Trails** 15 miles of multi-use trails (hiking, biking, and horseback); 3 miles of hiking only.
- **Trapping** Special-use permit required.

Prairie kingsnake

Grasshopper sparrow

Upland sandpiper

White-tailed deer

Wild Guide

Did You Know?
A cicada killer wasp's tunneling tendencies are beneficial to lawns. This behavior aerates the soil and helps rainwater soak in.

Cicada Killer Wasp

Sphecius speciosus

Status	Size	Distribution
Common	Length: can exceed 1½ inches	Statewide

The cicada killer wasp is an exceptionally large species, with rusty clear wings and black-and-yellow markings. Males often defend territories around the nests of one of more females. Females also cruise around, looking for good places to dig tunnels and searching around trees and shrubs for cicadas. Males, however, are incapable of stinging, and females (unless bothered) reserve their stinging for the cicadas they hunt.

LIFE CYCLE

Males establish territories about the same time dog-day cicadas emerge and start singing. Then females emerge and begin digging nest tunnels of nine or 10 cells in open areas, such as lawns and pastures. Females hunt, sting, and paralyze cicadas, transporting them into the nest. Females lay an egg on the cicadas, and the larvae hatch in a few days and start eating the cicadas. Within a month, the larvae finish growing, form a protective cocoon, and overwinter. In spring, they pupate for about a month, then emerge as adults.

FOODS

Adult cicada killer wasps feed on nectar and other sweet plant juices. To provide food for the young, female cicada killers hunt dog-day cicadas, using their stings to paralyze them, then stock their nests with one or two cicadas per cell. Cicada killer larvae feed on the cicadas.

ECOSYSTEM CONNECTIONS

Although they prey on cicadas, cicada killer wasps are preyed upon by a wasp called the velvet ant. A female velvet ant sneaks into a cicada killer wasp's tunnel and lays an egg in a nest cell. When a cicada killer wasp pupates, the velvet ant larva eats the pupa.

Outdoor Calendar

MISSOURI DEPARTMENT OF CONSERVATION

Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to buy permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you buy 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:
May 25, 2019–Feb. 29, 2020

Bullfrogs, Green Frogs
June 30 at sunset–Oct. 31, 2019

Nongame Fish Gigging
Impounded Waters, sunrise to sunset:
Feb. 1–Sept. 14, 2019

Streams and Impounded Waters, sunrise to midnight:
Sept. 15, 2019–Jan. 31, 2020

Paddlefish
On the Mississippi River:
Sept. 15–Dec. 15, 2019

Trout Parks
Catch-and-Keep:
March 1–Oct. 31, 2019

Catch-and-Release:
Nov. 8, 2019–Feb. 10, 2020

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

Bullfrogs, Green Frogs
June 30 at sunset–Oct. 31, 2019

Coyote
Restrictions apply during April, spring turkey season, and firearms deer season.
Open all year

Crow
Nov. 1, 2019–March 3, 2020

Deer
Archery:
Sept. 15–Nov. 15, 2019
Nov. 27, 2019–Jan 15, 2020

Firearms:
- Early Youth Portion (ages 6–15): Nov. 2–3, 2019
- November Portion: Nov. 16–26, 2019
- Late Youth Portion (ages 6–15): Nov. 29–Dec. 1, 2019
- Antlerless Portion (open areas only): Dec. 6–8, 2019
- Alternative Methods Portion: Dec. 28, 2019–Jan. 7, 2020

Dove
Sept. 1–Nov. 29, 2019

Groundhog (woodchuck)
May 6–Dec. 15, 2019

Pheasant
Youth (ages 6–15):
Oct. 26–27, 2019

Regular:
Nov. 1, 2019–Jan. 15, 2020

Quail
Youth (ages 6–15):
Oct. 26–27, 2019

Regular:
Nov. 1, 2019–Jan. 15, 2020

Rabbit
Oct. 1, 2019–Feb. 15, 2020

Sora, Virginia Rails
Sept. 1–Nov. 9, 2019

Squirrel
May 25, 2019–Feb. 15, 2020

Teal
Sept. 7–22, 2019

Turkey
Archery:
Sept. 15–Nov. 15, 2019
Nov. 27, 2019–Jan. 15, 2020

Firearms:
- Fall: Oct. 1–31, 2019

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

Wilson's (Common) Snipe
Sept. 1–Dec. 16, 2019

Woodcock
Oct. 15–Nov. 28, 2019

ILLUSTRATION: MARK RAITHEL

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Discover the natural wonders awaiting you at a Missouri conservation area. At Union Ridge Conservation Area, located in Adair, Putnam, and Sullivan counties, explore rare native savanna habitat. The area also offers fishing, camping, bird-watching, wildflowers, and hunting. For more information or to find an area near you, visit **short.mdc.mo.gov/Z4V**.

by **David Stonner**