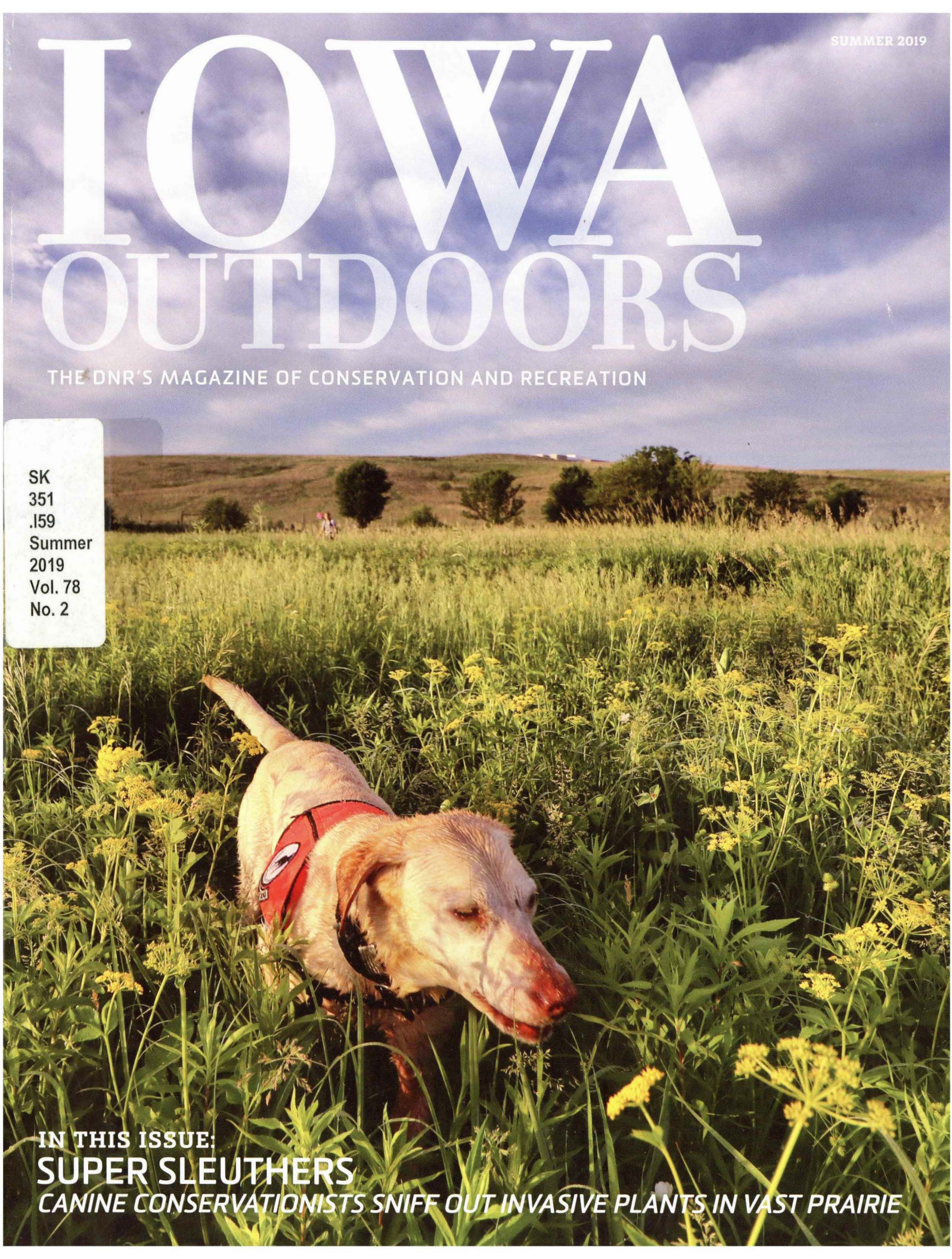
SUMMER 2019

IOWA OUTDOORS

THE DNR'S MAGAZINE OF CONSERVATION AND RECREATION



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SUPER SLEUTHERS

CANINE CONSERVATIONISTS SNIFF OUT INVASIVE PLANTS IN VAST PRAIRIE

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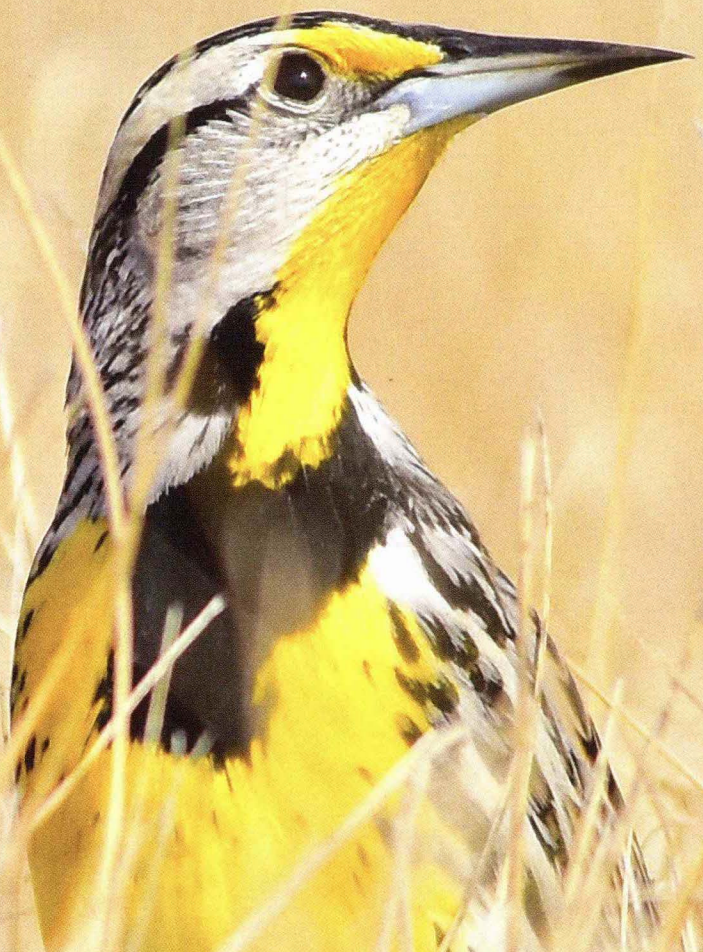

ABOUT THIS PHOTO

In summertime, when driving past or hiking through large prairie or grasslands, you may hear the beautiful song of the eastern meadowlark. Seeing them, however, is more difficult, as they often spend time hidden among prairie plants where they forage on the ground. They rely on about 6 acres to establish a territory. Declining grasslands have harmed the species. Populations plummeted 89 percent between 1966 and 2015, according to the North American Breeding Bird Survey.

PHOTO BY *ERIC BURSON*

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ABOUT THE COVER

Lily the tracking dog hunts for invasive plant species at the Neal Smith National Wildlife Refuge near Prairie City in Jasper County. Lily, along with biologist Melissa Steen and another tracking dog Utah, hunt down *Lespedeza cuneate* to prevent it from taking over important native plant species that help the prairie thrive.

PHOTO BY *KRISTIE BURNS*

ABOUT THIS PHOTO

Biologist Melissa Steen gives her tracking dog Lily a refreshing drink of water to keep her hydrated as the sun rises and the temperatures increase. The dog is trained to smell, locate and identify invasive plant species and may cover 10 to 12 miles daily. Get your own paws wet on page 34.

PHOTO BY *KRISTIE BURNS*

FEATURES

Contributors

Photo-journalist **KRISTIE BURNS** spent three years in Chicago covering presidential elections, then 16 years in The Middle East to capture photos of the culture. Back in the U.S., her focus is wildlife photography. Kristie has exhibited photos on the "Women of Egypt" at the Sony Gallery in Cairo, covered desert treks with nomads, street life in Cairo and tourism in Syria, Jordan and Egypt. Her work, published internationally, includes *Lonely Planet Guides* to Egypt and a Hollywood movie (the original Stargate). Her work has been exhibited at the Des Moines Botanical Center, Neal Smith Wildlife Refuge Gallery, Barnes & Noble, Grandview Gallery, Polk County Heritage Gallery and more. She is president of her company, BEarthIMages and Cameras for Conservancy, a non-profit dedicated to help conservation through photography.
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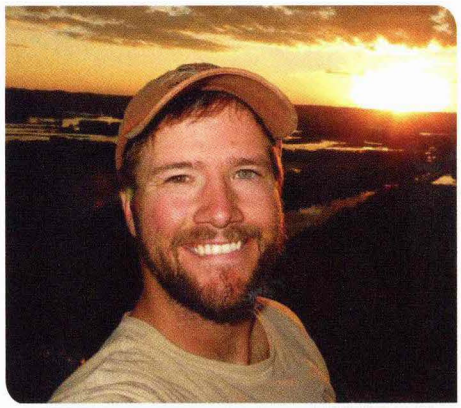

Former Clayton County naturalist **BRIAN GIBBS** has been addicted to wild places ever since his father first took him trout fishing in Yellow River State Forest. His passion for teaching others about enjoying and conserving natural beauty led him to work in such scenic places as Glacier National Park and Effigy Mounds National Monument. He is program director for the University of Wisconsin-Stevens Point Treehaven Field Station. ***briangibbs2671@gmail.com***

IOWA OUTDOORS

SUMMER 2019 • VOLUME 78 • ISSUE 2

Iowa Outdoors (ISSN 1936-2080) is published quarterly by the Department of Natural Resources, 502 E. 9th St., Des Moines, IA 50319. Periodicals postage paid Des Moines, IA. SUBSCRIPTION RATES: **$15** FOR ONE YEAR. PRICES SUBJECT TO CHANGE WITHOUT NOTICE. Include mailing label for renewals and address changes. POSTMASTER: Send changes to *Iowa Outdoors*, P.O. Box 37831, Boone, IA 50037-0831.

DNR MISSION
To conserve and enhance our natural resources in cooperation with individuals and organizations to improve the quality of life in Iowa and ensure a legacy for future generations.

EDITORIAL MISSION
We strive to open the door to the beauty and uniqueness of Iowa's natural resources, inspire people to get outside and experience Iowa and to motivate outdoor-minded citizens to understand and care for our natural resources.

MAKE A DIFFERENCE
DNR volunteer programs help Iowans give back to lands, waters and skies. *515-725-8261* or *iowadnr.gov/volunteer*

HOW TO DONATE
Charitable giving of land, funds, goods and services greatly enhances Iowa's outdoors. Call Kim Rasler at *515-725-8440.*

SHOW YOUR SUPPORT
Support wildlife diversity and REAP. Take your license plates and vehicle registration to your county treasurer's office to buy a pheasant, eagle, goldfinch, deer or trout natural resources plate.

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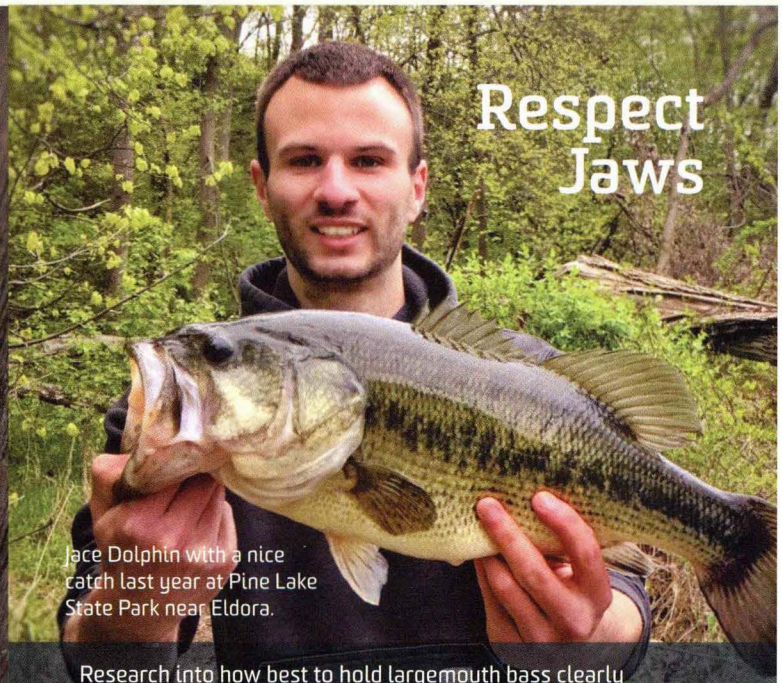
TIPS, TRICKS AND **MUST-KNOWS** TO ENHANCE YOUR OUTDOOR FUN

Repel Gnats and Relieve Sore Neck

Last summer on a photographic outing at Geode State Park, by luck a couple of walkers noticed this writer's swarm of pesky gnats around the face. They turned out to be loyal *Iowa Outdoors* subscribers and offered relief with some Absorbine Jr.—the 100-year-old product used for sore muscles, joints and arthritis pain. After dabbing some of the menthol and herb-based liquid around the neck, arms and face, it instantly repelled that annoying gnat swarm.

Respect Jaws



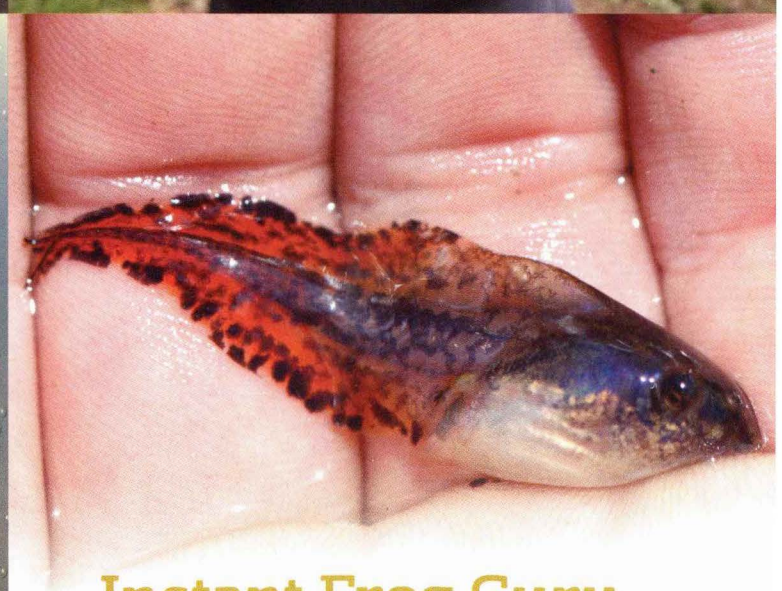
Jace Dolphin with a nice catch last year at Pine Lake State Park near Eldora.

Research into how best to hold largemouth bass clearly shows a two-handed, horizontal hold is safest for the fish. These fish resumed normal swimming and feeding behavior quickest. Most harmful is a one handed, jaw grip of a fish held horizontal, which places excessive force on the jaw. A safer option is to hold the fish vertically by the jaw instead.

Do the Dew Point

DEW POINT	HOW IT FEELS
Less than 50	Very Dry
50-55	Comfortable
56 - 60	Pleasant
61 - 65	Slightly Humid
66 - 70	Humid
71 - 75	Very Humid
76 or Higher	Oppressive

The amount of water vapor in the air affects summertime comfort. High levels of airborne moisture means muggy and uncomfortable. Confusingly, don't pay attention to the relative humidity data in weather forecasts, but instead use the dew point to know outdoor comfort levels. Dew points best reflects how your body will cool by the evaporation of perspiration. If the air is already saturated with moisture—a high dew point—perspiration will not evaporate, making people feel sticky and uncomfortable.



Instant Frog Guru

Unique among all Iowa tadpoles are those with red-tipped tails—that indicates it's a tree frog. (It could be either the eastern gray or Cope's gray tree frog, it's almost impossible to tell the difference even as adults even.) Amaze your angling buddies or anyone else around the water by looking at any tadpole and confidently stating if it's a tree frog or not.

ABSORBINE PHOTO BY BRIAN BUTTON; TADPOLE COURTESY KAREN KINKEAD; BASS COURTESY JACE DOLPHIN

Myth Busters

CORRECTION: The spring issue incorrectly stated lyme disease is caused by a virus. It is caused by a bacterium,treatable with antibiotics.

"THE DNR IS DESTROYING BENEFICIAL TREES IN NATURAL AREAS"

By Bryan Hellyer, Wildlife Management Biologist

Through much of the 1900s, wildlife managers focused on maintaining wetland-grassland areas for game, such as pheasants and ducks. Many game animals can thrive in exotic grasses or tolerate trees or brush that tend to invade grasslands when natural wildfires no longer sweep the land. But the needs of nongame wildlife species often were poorly understood, so managers focused on animals of most familiarity—species that often didn't require prescribed burns or removal of woody plants from grasslands-wetlands.

Since the early 2000s, DNR wildlife managers have removed undesirable woody vegetation across public wetland-grassland areas, such as the Prairie Pothole Region.

Northwest Iowa holds one of the largest, most important wetland-grassland areas left in the state. It provides vital nesting habitat for declining grassland birds, such as northern harrier, bobolink, and sedge wren; for declining wetland species like American bittern, king rail, and black tern; plus nesting and migration stopover habitat for many other species suffering nationwide declines.

Iowa once had 28 million acres of native prairie. Mother Nature burned portions frequently to keep out undesirable woody vegetation and allow abundant, diverse populations of grassland-wetland bird species.

Today, all that remains are mere remnants or reconstructions of native prairie, slightly less than two-tenths of one percent of what once existed. Remnant ridges of fire-resistant bur oak savanna exist on the landscape and some northwest lakes still contain bur oak stands along shorelines, but most were invaded by undesirable tree species, at one time kept in check by wild fires.

With increased knowledge of prairie management, other state agencies, the U.S. Fish and Wildlife Service, and The Nature Conservancy, Iowa Natural Heritage Foundation, Pheasants Forever and Ducks Unlimited are removing invasive trees from wetland/prairie and oak savannah ecosystems. The entire conservation community views this necessary to maintain dwindling prairies and wildlife that depend on prairie for survival.

I understand and respect folks who have lived their entire life and have always seen these stands of invasive trees, but I hope they understand this undesirable woody vegetation is a recent invader, and it is the DNR's responsibility to ensure future generations can see what Northwest Iowa once was and species such as Dickcissel, bobolinks, western meadowlarks and more that depend on grasslands and wetland to exist.

Ask THE Expert

Did I really see a goldfish in a pond?

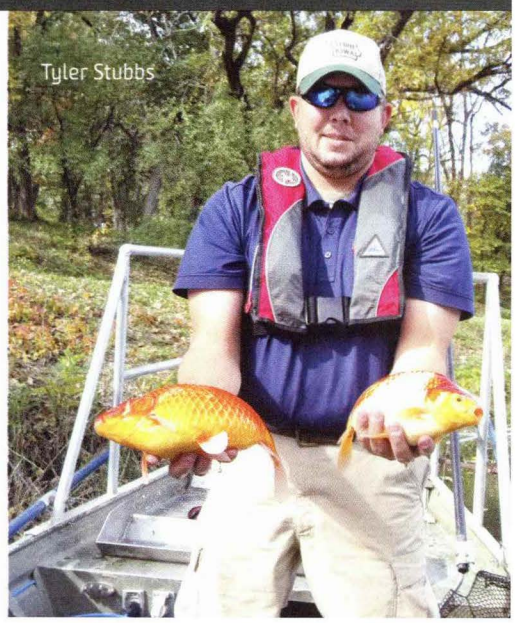
Native to Asia, goldfish came to America via the aquarium trade. It may be the first nonnative fish brought here. Often confused with koi and common carp, goldfish lack barbels (whiskers) on the upper jaw.

These common pet fish cause issues when owners release them into the wild, says community fishing biologist Tyler Stubbs. "It is illegal to stock any fish into public waters in Iowa, but it makes matters worse when it is a non-native species."

Releasing aquarium species into ponds, streams, lakes and storm sewers can harm the environment. Nonnative animals and plants may introduce diseases to native species or become invasive species that outcompete native species for food and space and cause problems for recreation. Several common invasive species were originally sold for aquariums.

Goldfish up to 3 pounds are sometimes seen in ponds. They compete with bluegill and young largemouth bass for food. Like common carp, they stir up sediment and uproot plants to reduce water clarity.

Stubbs recommends finding someone else to care for unwanted fish such as pet shops, private aquarists or checking aquarium enthusiasts on social media.



Tyler Stubbs

Stories From the Depths

A collection of reader-submitted accounts sure to inspire anglers young and old

HIT LITTLE RIVER LAKE FOR RECORD SETTING YELLOW BULLHEADS

Evidently DNR fisheries staff are raising some very high class yellow bullhead at Little River Lake in extreme south central Iowa. Fisheries biologist Andy Fowler, certified a new state record yellow bullhead at 2 pounds, 6.4 ounces and 15.2 inches last year. It beat the old record—also caught last year from Little River Lake—of 2 pounds 1.5 ounces. Angler Troy Dibbern of Wilton caught the new record.

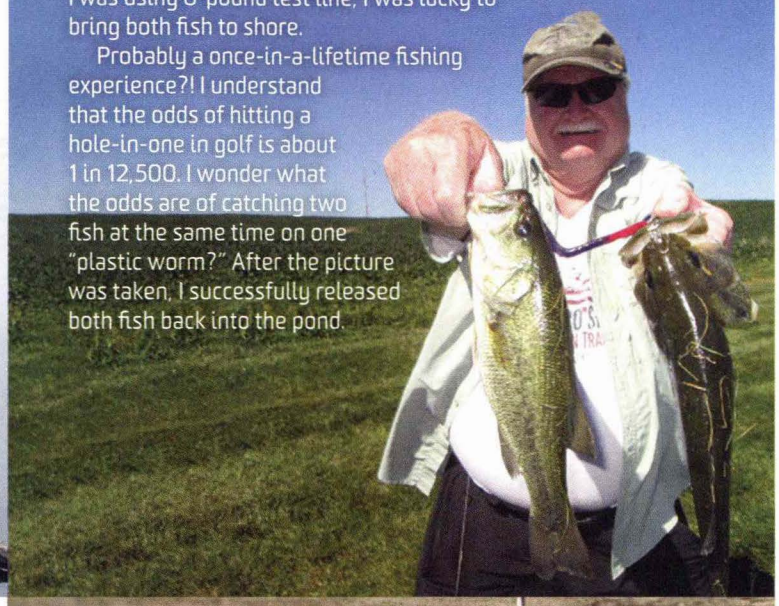
A HOLE-IN-ONE FISHING EXPERIENCE

BY *GEORGE W. VARCHOLA,* DAVENPORT

On July 6, 2018 at 10:15 a.m., at a private pond near Eldridge, I caught two largemouth bass on one lure. I was using The Worm (which is made in Coralville) and it was purple and red. The Worm has three pre-rigged hooks—one at the top, middle and end.

As I was fighting the fish, I noticed really big swirls in the water. To my surprise, a 15.5-inch bass was caught on the top hook and a 13-inch bass was caught on the bottom hook. I am sure the weight of both bass totaled over 4 pounds, and since I was using 6-pound test line, I was lucky to bring both fish to shore.

Probably a once-in-a-lifetime fishing experience?! I understand that the odds of hitting a hole-in-one in golf is about 1 in 12,500. I wonder what the odds are of catching two fish at the same time on one "plastic worm?" After the picture was taken, I successfully released both fish back into the pond.



GUMMY WORM BAIT

BY *CARRIGAN MCCOID,* ANKENY

It was our first time out fishing in 2019. My sister, two friends and I bought our fishing licenses. While at Walmart we decided to pick up a bag of gummy worms, just for fun. Then we set out determined to catch some fish.

Once we got there, one of my friends came up with a challenge.

Whoever catches the first fish with a gummy worm wins. We laughed, because who uses gummy worms as bait?

We took up the challenge anyway and in about 5 minutes, I felt a bite on my line and almost reeled the fish to shore when it got off my hook. I saw it briefly, and it was decent sized.

I cast my orange gummy worm back into the water and after some time went by, I felt my line being tugged at. I reeled in the bass. The gummy worm was a success!

My challenge for you is to go out and try fishing with this fun and sweet bait!

Together *HALF DAY ON $50*

HONEY CREEK LIVE SUMMER CONCERT SERIES

This summer marks the return of a free six-week concert series held every Thursday from July 4 to August 8 at Honey Creek Resort State Park.

The stage, on the resort's Great Lawn, allows for scenic views of the lakeside resort and sprawling Rathbun Lake.

The lineup features Iowa musical acts and boasts nationally-recognized artists in pop-rock, country, folk rock, blues and funk. All shows are family-friendly, with the vast lawn providing ample space for children to play.

Food and drinks, including beer and bottled alcoholic drinks, are for sale to support the concert series and future events.

Acts begin at 6 p.m. and finish around 9 p.m. Attendees should bring a chair or blanket to sit on. Outside food and beverages, smoking and pets are prohibited.

OUTDOOR CONCERT SERIES LINEUP

JULY 4 – CASEY MUESSIGMANN

There aren't many things better than a cold one with country music and this Iowa born-and-raised country crooner will have you dancing all night! He's a Nashville recording artist and a member of #TeamBlake on #TheVoice Season 3!

JULY 11 – STANDING HAMPTON

A premier export of the Des Moines music scene, Standing Hampton performs selections from the '70s, '80s and beyond.

JULY 18 – DECOY

Decoy is a pop/rock band that creates its own unique sound from an eclectic mix of influences.

JULY 25 – DIRTY ROTTEN SCOUNDRELS

Four young gents in suits bring you the best '50s and '60s rock'n'roll hits from artists like Buddy Holly, Elvis, The Beatles, The Kinks and more.

AUG. 1 – B2WINS

B2Wins have a distinctive, signature sound that draws influence from a variety of genres. The music features power-pop melodies, a dynamite hip hop rhythm section, funky dynamic bass lines with some room for improvisation and crafty solos.

AUG. 8 – FINAL MIX

Final Mix serves up the latest in R&B, jazz fusion, blues, hip hop, rock & roll and original material.

Learn more, see full resort amenities and make reservations at ***honeycreekresort.com*** or ***866-797-5308***.

New Collectible Hard License Cards!

A new collectible hard card is available for purchase in two designs—a largemouth bass or a pheasant—created by native Iowa artist Bruce Gordon. The durable hard card costs $5 and includes purchased licenses printed on the back for the year. Cards are available to purchase online or in person and will be mailed out after purchase.

New designs on the hard card will be unveiled each year. With purchase of a hard card, a paper license is provided immediately, so buyers can hunt and fish while the hard card is being mailed to the purchaser.

Access it or learn more at *iowadnr.gov/GoOutdoorsIowa*. Customer may continue to visit any license agent location to purchase their licenses and permits.

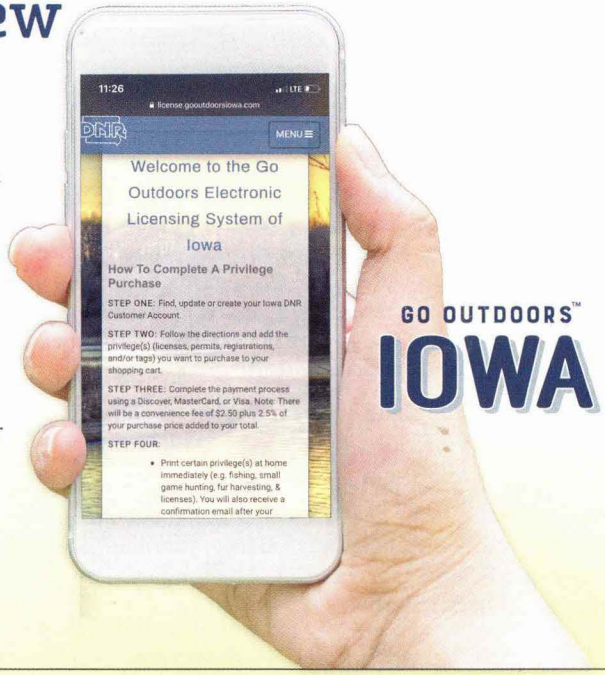
Go Outdoors Iowa with New Licensing App

The latest innovative technology is now right at your fingertips when it comes to your Iowa hunting and fishing licenses! Iowa DNR has recently launched Go Outdoors Iowa, a new licensing system that makes it easier and available for users to:

- Report Harvests
- Apply for Controlled Hunts
- Electronically Manage Your Licenses

New this year:

- Download the GoOutdoorsIowa app via the AppStore or Google Play that allows you to purchase, store and renew your licenses, view hunting regulations, current sunrise/sunset times and report your harvests
- Sign up for Auto Renew
- Purchase a Collectible Hard Card
- Produce a valid license with your phone
- Reprint Your Current Licenses



DNR UNVEILS INNOVATIVE, NEW ONLINE HUNTING AND FISHING LICENSE SYSTEM

The DNR has launched the latest innovative hunting and fishing licenses technology available at your fingertips.

The new system, Go Outdoors Iowa, makes it easier and more convenient for hunters and anglers to not only purchase licenses, but to manage profile information, apply for quota hunts and report harvests.

Users can log-in to their customer profile from anywhere with a cellular/internet connection to edit customer details, purchase new licenses, reprint licenses, set up license auto-renew, report a harvest and submit quota hunt applications.

Best yet, you can sync your licenses to the app, and even if there is no cellular or internet coverage, produce a valid license to conservation officers in the field.

The Go Outdoors Iowa app, downloadable for free through the App Store or Google Play Store, allows users to purchase and access their hunting and fishing licenses from anywhere, anytime via mobile devices, as well as renew licenses, view hunting regulations, report harvests and view current sunrise/sunset times.

Together

BY *BRIAN BUTTON*

Liquid Heartbreak

On average, 33 Iowans drown every year. Many could be prevented. Be water wise and learn how to avoid a watery departure.

Each summer, drownings affect a wide swath of outdoor users, from people swimming in lakes and rivers, falling off docks or wading in rivers to anglers and boaters. As hotter summers push Iowans toward water, drownings increase. Many are preventable.

The main drowning causes are: lack of swimming ability, alcohol use, failure to wear life jackets, lack of barriers to unsupervised swimming areas, lack of close supervision while swimming and seizure disorders. Heed these tips to stay water safe. Some are common sense, but others require skills or action to avoid tragedy.

Become Proficient

Roughly one-third of Americans lack adequate swimming skills or cannot swim. Swimming is not only great exercise, but a life-saving, life-long skill worth knowing, but stronger swimmers have more comfort with greater swimming ease and efficiency. Bolster your abilities or learn to swim by taking formal swimming lessons. Inquire at municipal pools, colleges and YMCA facilities. Classes exist for babies to senior adults.

Life Jackets

Based on U.S. Coast Guard statistics, 76 percent of boating deaths result from drowning. In nearly 85 percent of those deaths, life jackets were not worn. Wear properly sized, U.S. Coast Guard-approved life jackets regardless of the distance traveled, boat size or swimming ability. In 2007, 29 percent of drowning deaths nationwide occurred on boats that were anchored, docked, moored or drifting.

Beer and Booze

Among adolescents and adults, alcohol is involved in up to 70 percent of water recreation deaths, nearly a quarter of emergency visits for near-drowning and about one-in-five boating deaths. Alcohol alters balance, coordination and judgment. Its effects are amplified by sun exposure and heat. Stay sober near waterbodies.

Skills that Save Lives

CPR and rescue breathing are proven to save lives and improve outcomes for near-drownings. The quicker aid begins, the better. In the time needed for paramedics to arrive, your skills could save a life or prevent permanent damage. If already certified, learn the latest techniques and refresh skills by recertifying. Inquire at your local hospital, workplace or doctor's office for classes.

Eagle Eyes Close By

A responsible adult needs to *constantly* watch young children when swimming or playing near water as drowning occurs quickly and quietly. Be close enough to touch the child at all times. Once submerged, people are difficult to find in Iowa's cloudy water.

Expect the Unexpected

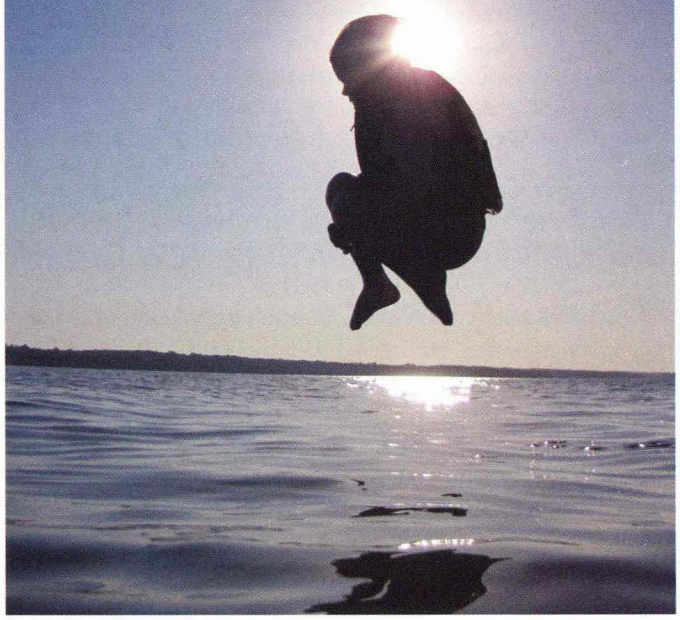
Iowa rivers and lakes can have sudden drop offs, holes, submerged shelves and foot holds. Exercise caution near all waters. Current strength can deceive even strong swimmers.

Avoid Obvious Hazards

On rivers, stay clear of sweepers and strainers—fallen trees and logs that lay across portions of waterways where currents can pin and hold watercraft and occupants underwater. Avoid dropoffs near sand and gravel bars. On large rivers, drop offs can measure more than 5 feet, posing hazards. Re-circulating, powerful currents from even small dams are unforgiving drowning machines. Stay clear above and below *all* dam areas.

DROWNING FACTS

- In Iowa, drowning is the third leading cause of "injury death" for those under age 14. For every child drowning death, another five receive emergency care for non-fatal submersion injury.
- Drowning causes more deaths for children ages 1 to 4 than any other cause except birth defects.
- On average, 33 Iowans drown annually.
- Eighty eight percent of child drownings occur with at least one adult present.
- More than half that survive a near drowning will require hospitalization. Near-drowning injuries can cause severe brain damage that may result in long-term disability such as memory problems, learning disabilities and permanent vegetative state.



ACTIVITIES, TIPS AND EVENTS FOR THE WHOLE FAMILY

THE BROKEN RECORD

The January 2019 issue of *Scientific American* featured a story on how humans "Evolved to Exercise!" One aspect was that apes could sit or lay all day and binge watch 63 hours of *Game of Thrones* and suffer no ill effects. Similar activity for us would reduce our life expectancy by one day.

According to the article by Herman Pontzer, as our human ancestors evolved, we started to be more active in pursuit of food. We hunted and gathered from a wider range than other branches of the extended family. As such, our physiology adapted. Meanwhile, our distant animal cousins had no need for such range—similar adaptions were not needed.

Ample and growing evidence shows such movement also played a role in the "massive expansion of the human brain" and more importantly, still requires activity for normal brain development. The author refers to the work of colleagues David Raichlen and Brian Wood, from the University of Arizona and University of California respectively, and their work focusing on the Hadza tribe of hunters and gatherers in northern Tanzania.

These researchers trace how humans evolved in such a way that developed a "dependency on physical activity." Feet that could no longer grab a branch became adroit for long walks—in turn, providing more food and thus impacted development. A common term for that process is survival of the fittest. Those that were fit survived as were many generations of offspring. That is until recently. Hadza tribe members log 12,000 to 18,000 steps a day. In America, we seem to get that same amount in a week. It appears our ancestors used to run prey to the ground prior to perfecting our use of the bow and arrow. But now driving to the grocery store seems like a chore as more people opt for delivery.

In recent articles, I mentioned research that explores the molecular level and offers similar observations. Advances in studying the chemical processes of metabolites show "exercising muscles release hundreds of signaling molecules into the body and we are only beginning to learn the full extent of their physiological reach." The article, like many others, extolls exercise. "Exercise may blunt the rise in cortisol, the stress hormone. It is known to reduce insulin insensitivity, the immediate mechanism behind type 2 diabetes, and helps shuttle glucose into muscle glycogen stores instead of fat. Regular exercise improves the effectiveness of our immune system to stave off infection, especially as we age. Even light activity, such as standing instead of sitting, causes muscles to produce enzymes that help to clear fat from circulating blood."

The negative aspect of the article was that Tanzanians burn the same calories each day we do—a result of their activity creating more efficient bodies. Thus, more activity for them doesn't burn more calories. That requires a look at diet in addition to activity.

Once again, the message is clear—gather friends and hunt for great outdoor adventures. Or perhaps sign up for those bowhunter classes offered by the Iowa DNR. Get outdoors and get active.

TIM LANE is a nationally-recognized authority on public health and physical activity. He is past president of the Iowa Association for Health, Physical Education, Recreation and Dance.

But Why?

Helping adults answer children's nature questions

DECLAN, 4, IN WATERLOO, ASKS:

Why do animals have different feet?

The next time you and a child see a track or animal, take time to examine and explain the details to young children. Here are some basics.

Wildlife use their feet just like humans—for walking, running and standing, plus also grooming and grabbing food. Each are different, designed specifically for that animal species.

White-tailed deer have a specialized thick nail, or hoof, for running from prey and pawing for food. Small mammals' feet are adapted for walking and gathering food. These soft-footed animals have pads to reduce friction and cushion limbs when running. Paws also contain claws for digging, such as the badger, or sharp, curved claws for climbing, like the squirrel.

Aquatic animals often have webbed feet to aide propulsion, save energy on long swims, catch prey and escape predators. Webbed feet also provide support in muddy environments. A beaver's webbed hind feet have split toes used to comb oil through fur for waterproofing.

Birds have different feet, too. Raptors' talons are designed for perching and grabbing a meal, but limits walking. Songbirds, however, can perch, walk or hop on their feet, which aids in food gathering and roosting in many settings.

Most birds have three forward-facing toes and one pointing back. Climbing birds, such as woodpeckers, have two toes forward and two back to better cling to tree bark. Wading birds, such as the great blue heron, have long toes to provide support in muddy areas.

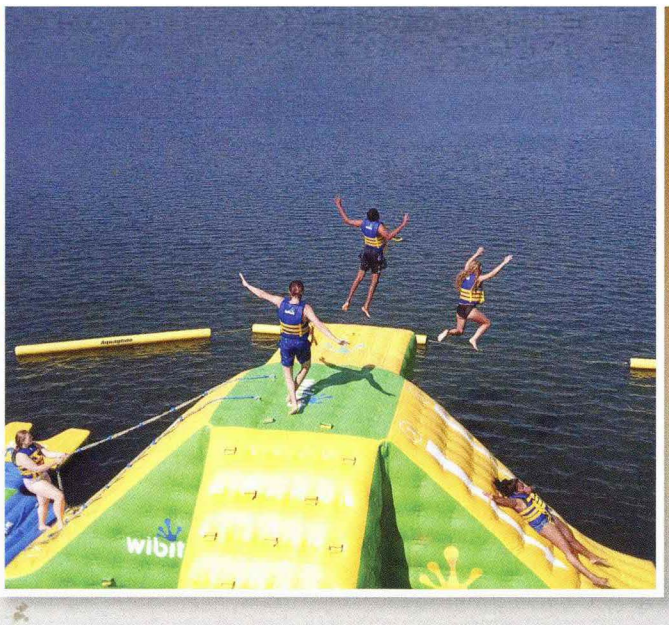
Make a SPLASH at Iowa's First AQUAPARK

Beat the heat at Honey Creek Resort's Rathbun Lake Aquapark. The 3,900-square-foot water sport attraction is the first of its kind in Iowa. Installed last year, the new outdoor water park is open all summer through Labor Day, Monday, September 2.

Kids and adults can enjoy exploring and playing on 16 different inflatable Aquapark components, which can accommodate up to 40 users at once.

Admission is included with an overnight stay at Honey Creek, or visitors may purchase a day pass for $15. Day passes include admission to the Aquapark, indoor waterpark, water trampoline, kayaks, bikes, stand up paddleboards and more.

The floating waterpark requires life jacket use. Jackets are provided by the resort.



AQUAPARK HIGHLIGHTS

Action Tower XXL: Test your endurance through climbing, jumping, crawling and sliding.

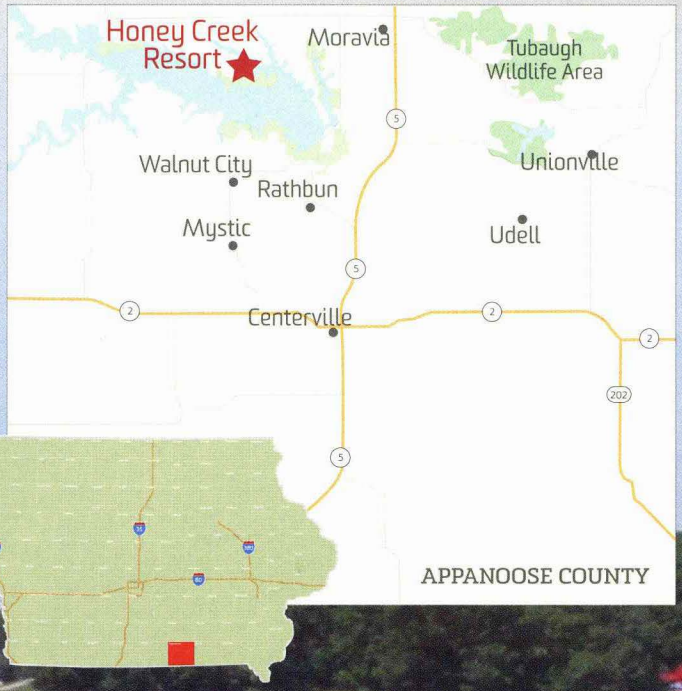
Cliff: A mountain of a challenge. You'll need speed, strength and agility to get past this obstacle.

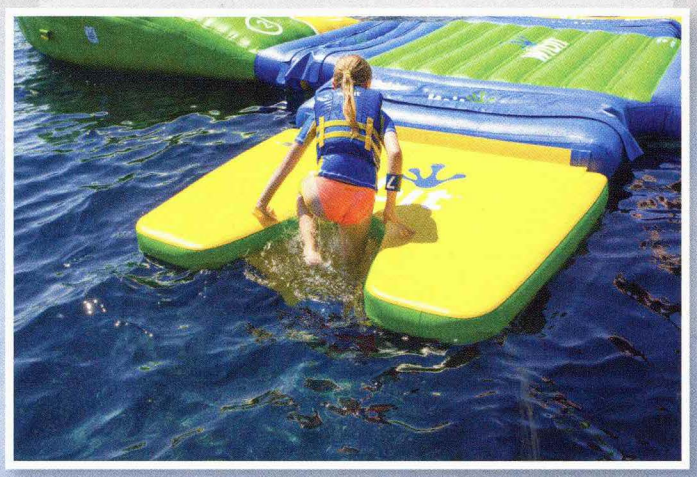
Flip: Jump on one end and blast your friends off the other.

Slide: Whizz down the nearly four-foot slide.

Foxtrot: A challenging balance beam great for head-to-head competitions.

Zulu: Zulu combines a five-foot-high climbing wall with an exhilarating zero-entry slide.





Learn more, see full resort amenities and make reservations at *honeycreekresort.com* or *866-797-5308.*

From the Archives

From the August 15, 1946 *Iowa Conservationist* (forerunner of *Iowa Outdoors Magazine*)

Obviously times have changed dramatically, as proven with this account of a chewing tobacco and deer routine from the 1930s at the state fair. While the old animal exhibits stopped decades ago, today's fair goers can still see fish in the original 1921 aquarium and waterfowl outdoors—all at the DNR building.

Fair Visitors to Miss Mac and Sammy

George B. Coon, or Mac, as he was familiarly called by thousands, and one of the most colorful features of the Fish and Game Exhibit, will not be there this year. Mac, father of the State Fair Fish and Game Exhibits, keeper of the animals, early day game warden, father of modern conservation officers, spinner of tall tales, lover of life, and showman extraordinary, is dead at age 80.

During the last prewar fair, while holding an armful of deodorized skunks and entertaining a group of wide-eyed youngsters with a running commentary of harmless yarns and wisecracks, Mac was interrupted by a helper with information that wolves were fighting. Leisurely replacing the skunks, Mac separated the snarling wolves and, turning to his helper, said, "I just live for the state fair. If they ever quit the fair exhibit I think I'll call it quits, too."

On December 7, 1941 the Japanese attacked Pearl Harbor and the army took over the state fairgrounds. In 1942 the fair was cancelled and when fair time rolled around in '43 with no fair coming up, Mac Coon called it quits for good.

Once Mac arranged for a special showing of "his animals" to a group including school teachers, one night after the building was closed to the public for clean up. It was his mistake to let other employees know of his plans in advance, and, in place of his harmless skunk, the staff substituted a skunk with a full compliment of artillery (not de-scented). All went well until the final demonstration, when Mac handled the skunk.

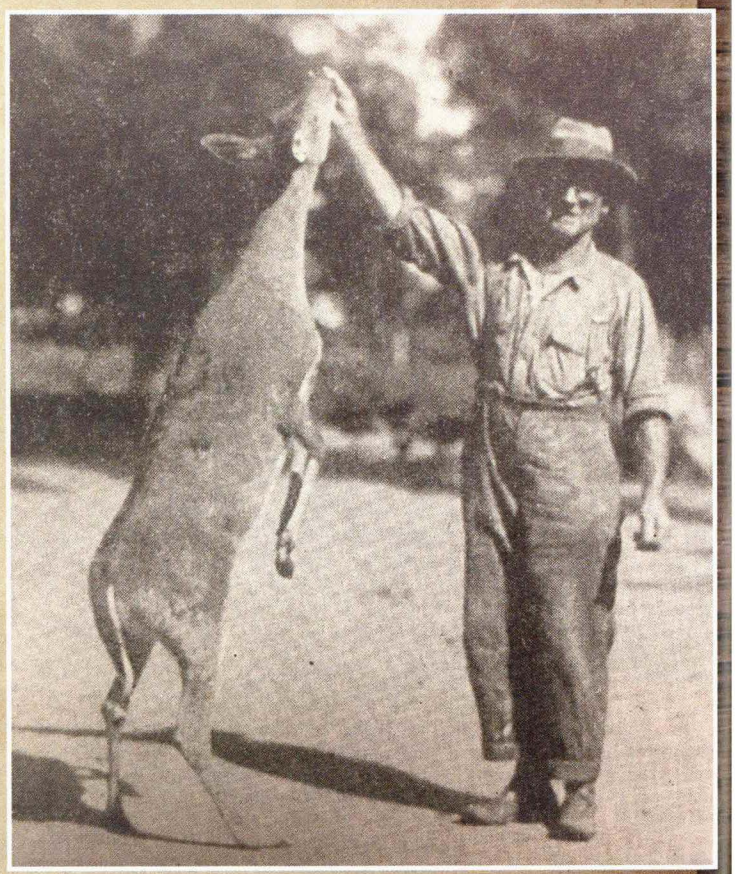
Sammy called it quits, too, shortly after Mac's death. Sammy was the magnificent, buck white-tailed deer that ruled the outdoor deer pen at the fairgrounds for almost ten years. Sammy, an orphan, was started on a bottle by Mac when the fawn's spindly little legs were still too weak to support his emaciated body.

Sammy, like Mac, was a showman extraordinary, and the two seemed to have a gentleman's agreement, for when Mac was putting on his act, Sammy remained inconspicuous. When Sammy had the floor, Mac would pout a little but never try to steal the show.

It was when the two were playing a duet that keeper, deer and visitors were most happy. Possibly the best remembered of their acts was the tobacco chewing skit.

At feeding time Mac would enter the deer yard, place mash in the feed trough, and busily engage in cleaning up the pen. Sammy, meanwhile, would daintily dispose of his supper. When finished, the deer would approach the working man and nudge him several times none too gently in the back with the curve of his well-formed antlers. Apparently perplexed, Mac would turn around, remove his hat and scratch his head with one hand, with the other reach in his pocket for a plug of tobacco and take a bite. With the amazing speed of wild things, Sammy would bite off a sizeable chunk of the plug still in his keeper's hand. When Mac scolded the animal for his theft, Sammy would look up into his face with sober, big-eyed attention and solemnly chew his stolen tobacco in perfect imitation of the old man.

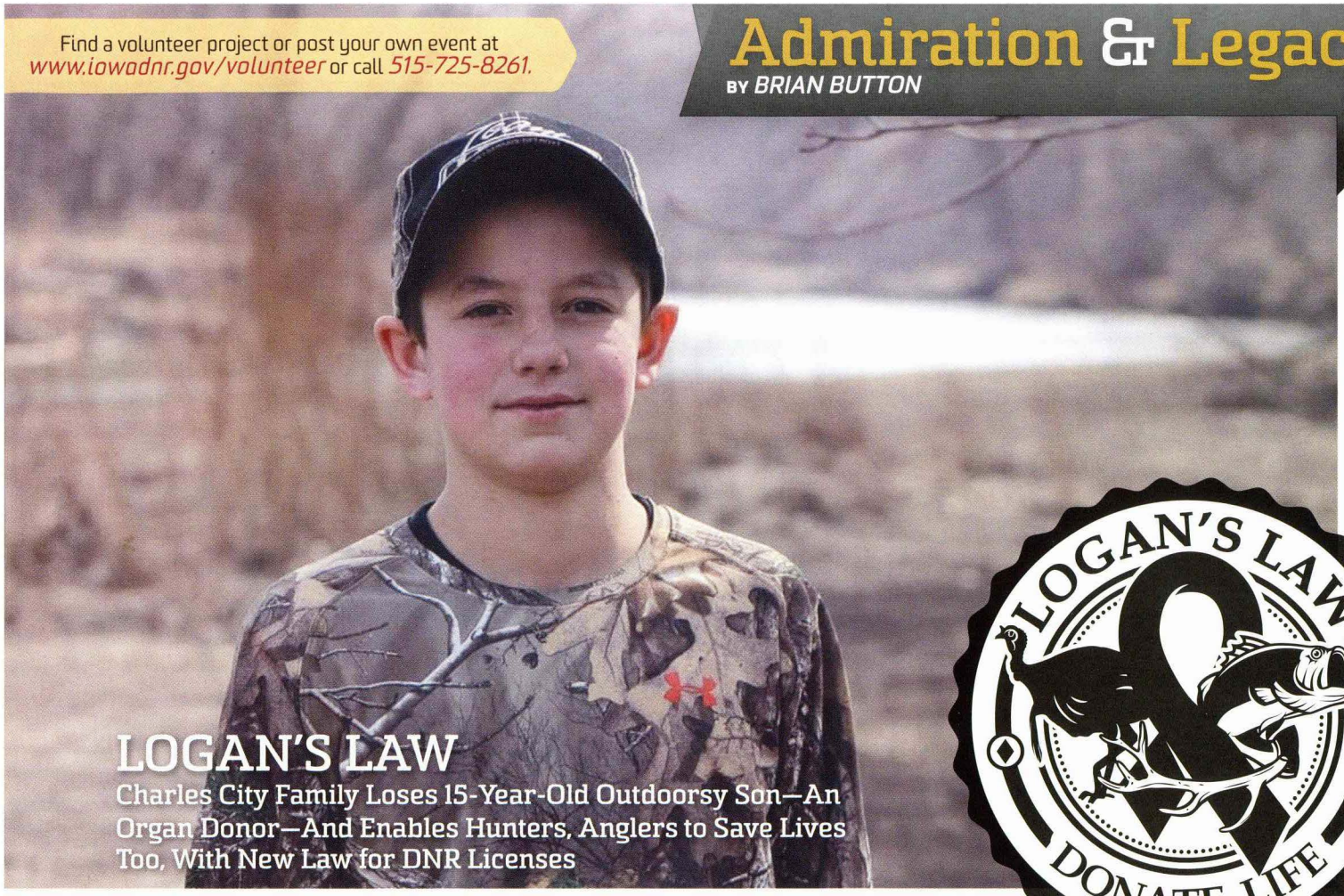
The pantomime closed when Mac would wink at the crowd, open the deer yard gate and step out. Sammy always had the last word. Looking straight at Mac, he would pucker up his lips and blow "Phut-t-t-t" to spit out the tobacco.



Find a volunteer project or post your own event at *www.iowadnr.gov/volunteer* or call *515-725-8261.*

Admiration & Legacy

BY *BRIAN BUTTON*



LOGAN'S LAW

Charles City Family Loses 15-Year-Old Outdoorsy Son—An Organ Donor—And Enables Hunters, Anglers to Save Lives Too, With New Law for DNR Licenses

Sometimes tragic events trigger impactful results. Logan Luft, 15, was fatally injured in a Fourth of July ATV accident in 2017. The youth had chosen to be an organ donor, as shown on his minor's driver's license. Upon his death, his organs saved five lives and his tissue and bones helped another 21.

"He chose to be an organ donor—a discussed choice with us," says Logan's mother, Wendy. "Then a year later he died." A 15-year-old Minnesota girl received his liver. A 7-year-old Kentucky girl his heart. A 3-year-old girl a kidney. A 39-year old man another kidney and a 52 year-old woman from North Dakota the pancreas.

Wendy and Lenny Luft have met them all.

Logan didn't need the organs anymore, says Wendy. "If we buried them that day they'd be gone forever. Now we get to see these kids grow up and embrace their future. Life doesn't end at death," she says, noting the families that received Logan's organs have embraced the Lufts.

The mother of the girl who received Logan's liver said, "From here on out this little girl is as much yours as ours now."

For me "It gave me a sense that Logan is still with me," says Wendy. "It's a feeling of never having to say goodbye to Logan. When you lose a child you want something to live on. More importantly, he is in five people and 21 tissue and bone donations in 21 different people from New York to Georgia in seven states. If that is not an impact, I don't know what is."

Logan's father, Lenny, says, "It has gotten us through to this point and day. It helped us get through. We have purpose and hope. For us it's everything. I can't hammer that enough. When someone loses someone to have the same sense of hope we have now" from giving life to others. "If others can have that too, it helps them through the grieving process. Without it they would still be locked into the past. We've gotten a little past it. Hope and purpose has come full circle."

It was Lenny, a Charles City police officer, who heard on the radio while cruising the city that Minnesota had passed an organ donor law for anglers and hunters. The Lufts got to work. It was a perfect fit since Logan was such an avid hunter and angler. They got in touch with their legislators.

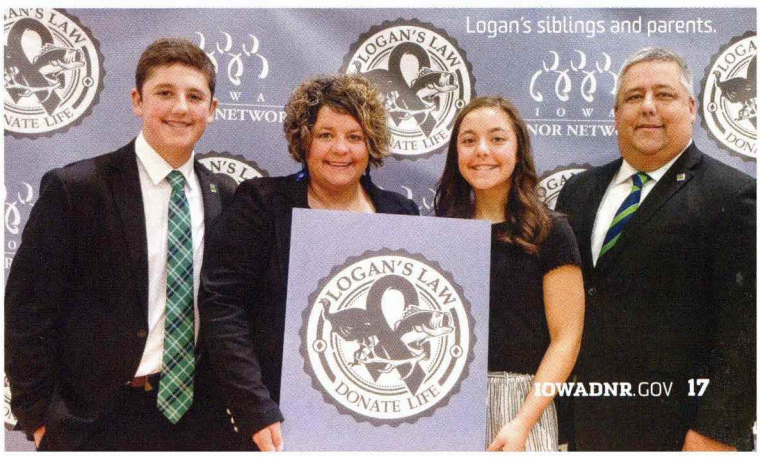
Logan started hunting young and shot his first buck at age 10. Two years later, father and son both shot their first turkeys on the same day together. He loved fishing and started a fishing club at school. Wendy says Logan's life goal was to work for the Iowa DNR.

And now with Logan's Law, he will be in a way. Iowans will be asked when they purchase a hunting or fishing license if they would like to be an organ donor. The Lufts say that will save lives through increased awareness as DNR licenses are renewed annually versus 8 years for driver's licenses. The law also will add organ donation education into the hunter's safety education course. Currently, nearly 600 Iowans are awaiting organ donation, including a DNR employee.

"Iowans are the most giving and compassionate people I know," says Wendy. "This law is just one more way we can show what it's like to be a giving person in the state of Iowa. It leaves a legacy."

The law becomes effective later this summer. But there is no need to wait. Save a life and give your grieving loved ones hope and purpose too.

Visit *iowadonornetwork.org* to register or learn more.



Logan's siblings and parents.

PHOTOS COURTESY LUFT FAMILY

STORY AND PHOTOS BY *BRIAN GIBBS*

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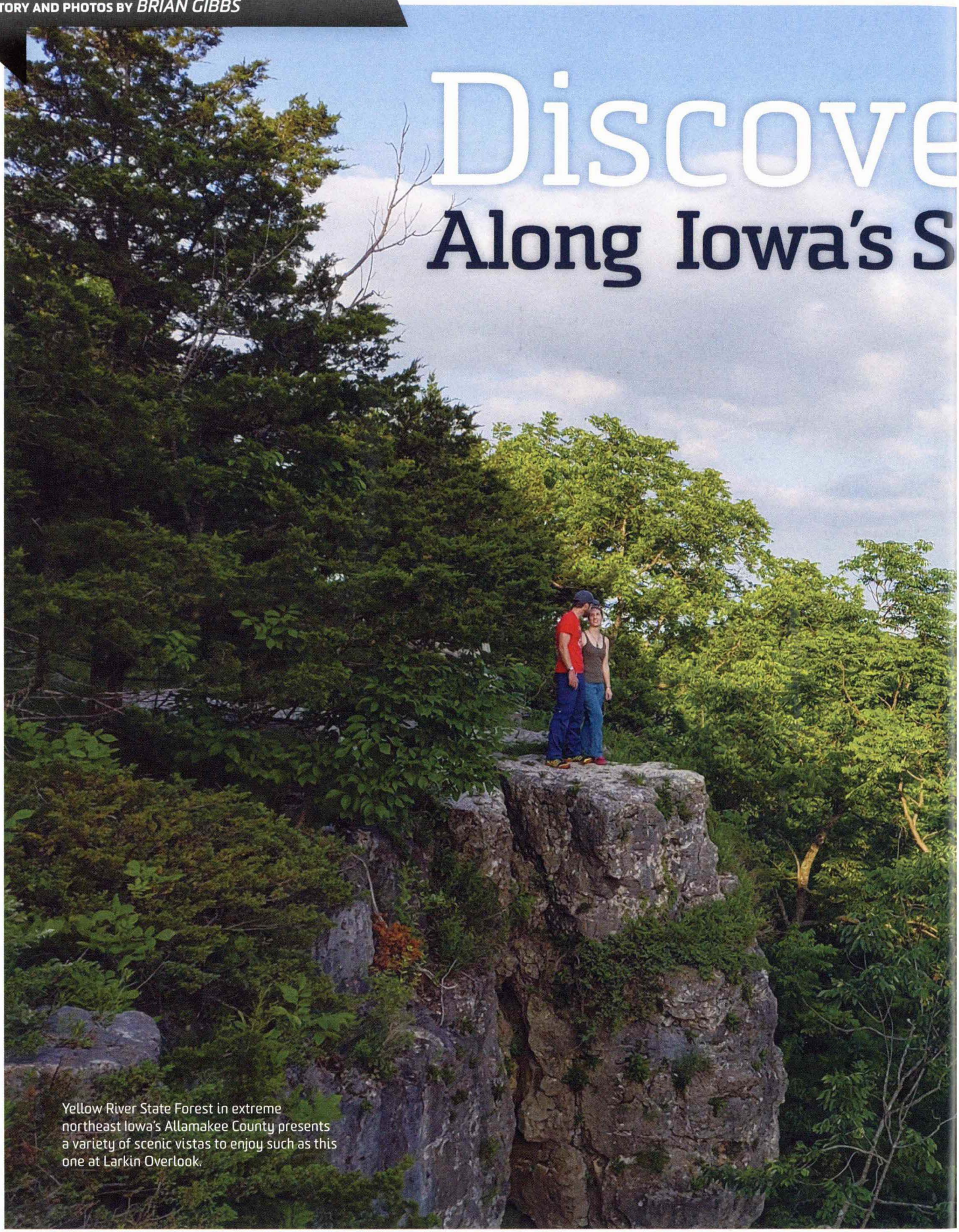
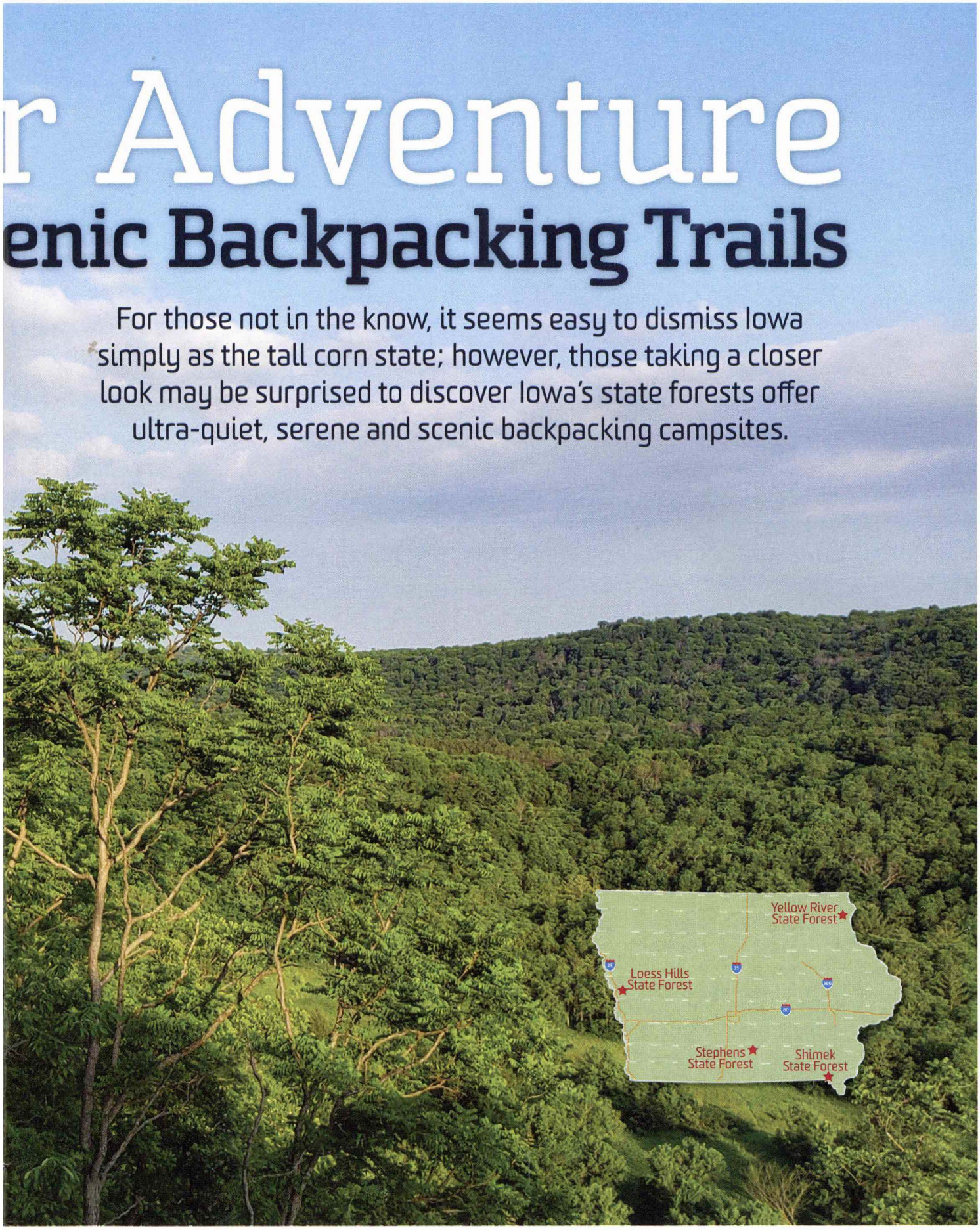


Yellow River State Forest in extreme northeast Iowa's Allamakee County presents a variety of scenic vistas to enjoy such as this one at Larkin Overlook.

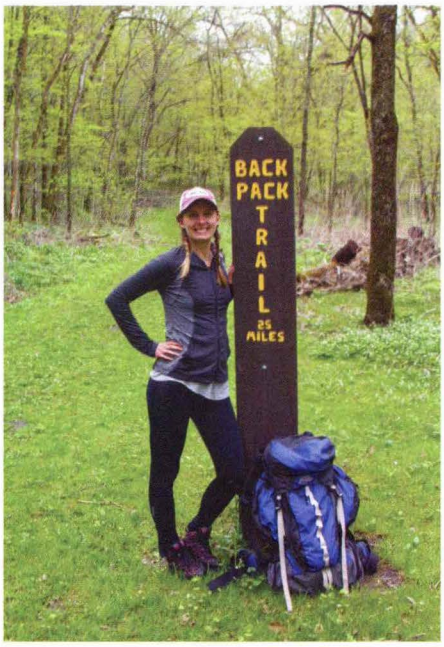
r Adventure

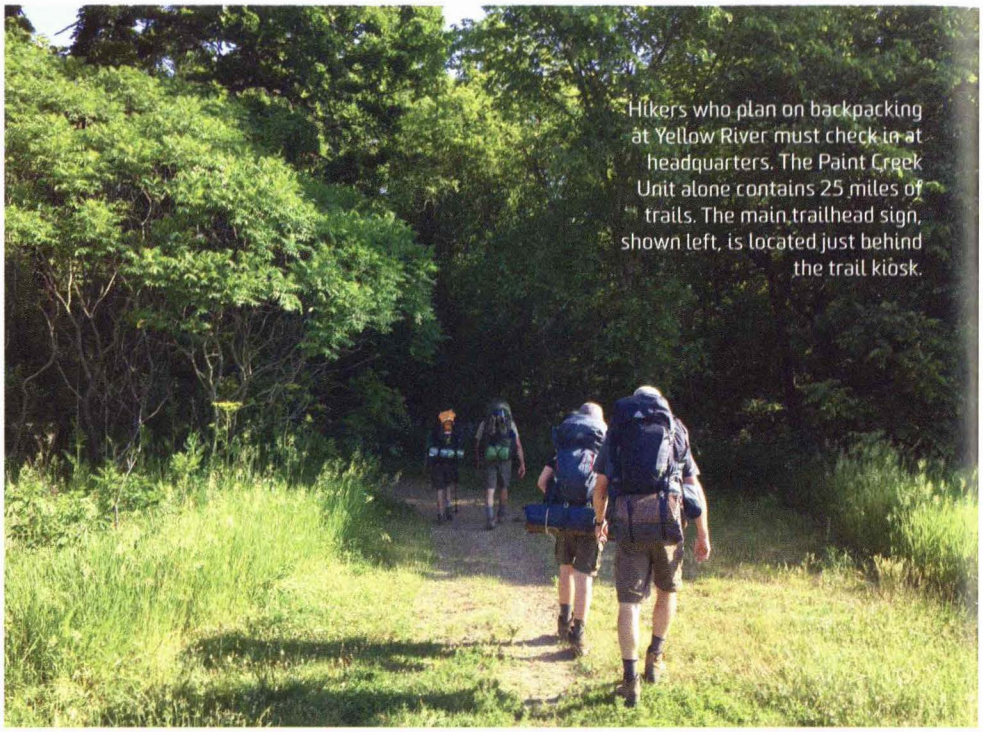
enic Backpacking Trails

For those not in the know, it seems easy to dismiss Iowa simply as the tall corn state; however, those taking a closer look may be surprised to discover Iowa's state forests offer ultra-quiet, serene and scenic backpacking campsites.



Lost In Iowa





Hikers who plan on backpacking at Yellow River must check in at headquarters. The Paint Creek Unit alone contains 25 miles of trails. The main trailhead sign, shown left, is located just behind the trail kiosk.

Experience Iowa's Most Treasured Backpacking Hikes

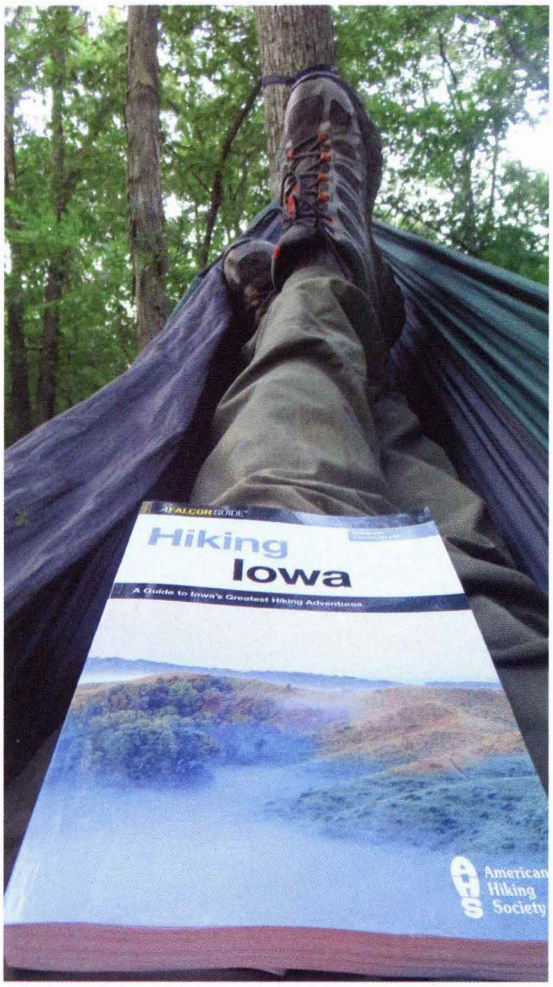
Summer and fall are great times to explore Iowa's backpacking trails, but hikers who camp in the spring will be delighted to discover hundreds of wildflowers lining the trails. Fresh from a recent rain, the earth smells like spring and the forest is radiating green. Pine trees coat the chalk-colored bluffs. Bird song serenades with each step. A gentle stream flows by the trail and clear water tumbles over colorful stones. The ethereal song of a Louisiana waterthrush echoes from the stream. Eagles are soaring above the giant red oaks. This is Yellow River State Forest, a rugged landscape and globally important bird area in the heart of Northeast Iowa's scenic driftless area.

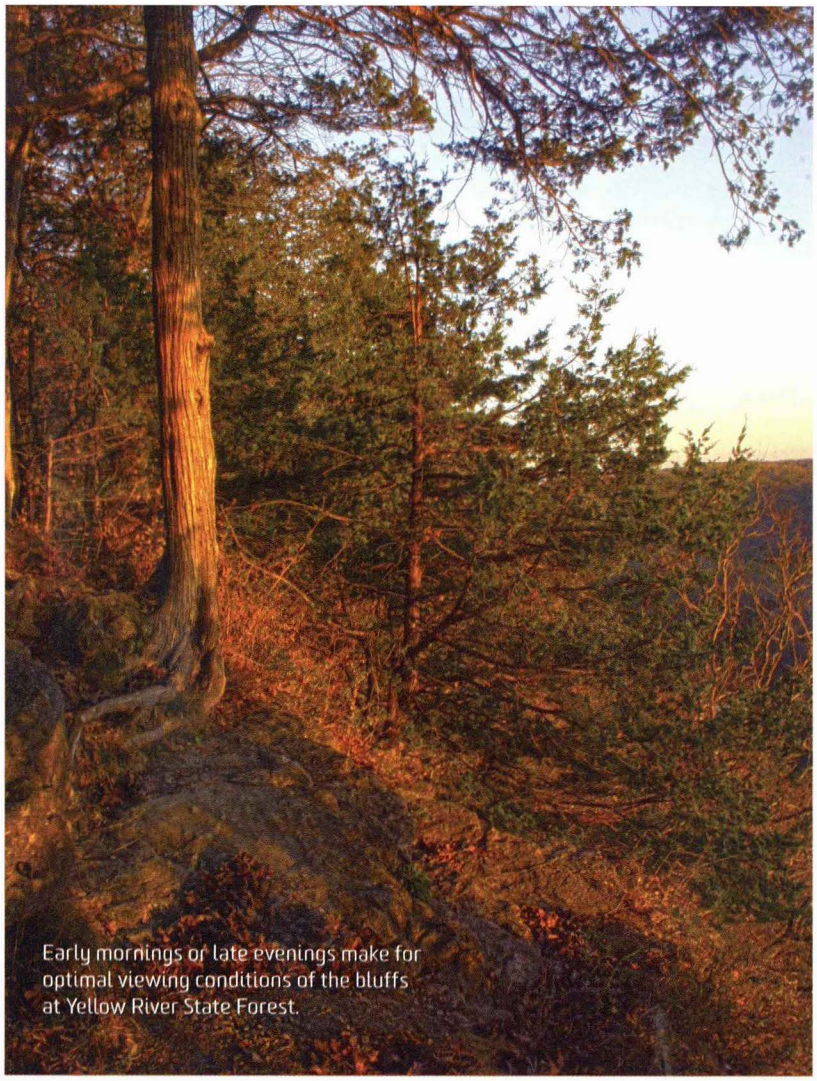
Characterized by its rocky topography, majestic trees, scenic overlooks, cold-water trout streams and 25 miles of trails, the 8,500-acre Yellow River State Forest is a hiker's paradise that has been featured in Backpacker Magazine.

Before hitting the trail, hikers should register at the park headquarters kiosk. Four hike-in sites, furnished with a picnic table and a firepit, are available on a first-come basis in the Paint Creek Unit of the forest.

From the trail kiosk, take the Forester Trail to hike amongst a canopy of large oak and maple trees. At half a mile, the trail forks and hikers can stay right to Camp Glenn Wendel, which rests by a small pond overlooking the forest, or go left on a strenuous but beautiful hike to Camp John Schultz. Make sure to pack a hammock if you decide to stay at Camp John Schultz, as the campsite is nestled in a scenic grove of towering white pines.

Beginning backpackers or hikers looking for easy family hike-in campsites should check out the Brown's Hollow campsite located off either Donahue Road or Firetower Road. This one-mile hike features a level walk into a gorgeous campsite surrounded by mature walnut trees and a clearwater stream.





Early mornings or late evenings make for optimal viewing conditions of the bluffs at Yellow River State Forest.

Larkin Overlook at Yellow River State Forest.

SUNSET TREE PHOTO BY BRIAN BUTTON

Lost In Iowa

Spring Wildlflowers such as Virgina bluebells are a common sight along the trails in Yellow River State Forest and Stephens State Forest.

Backpack Iowa's Largest State Forest

Just an hour outside of Des Moines, the remote 15,500-acre Stephens State Forest offers backpackers a memorable opportunity to explore the wild side of southern Iowa. The rolling topography of the Woodburn Unit feels like an undulating wooded hike through a real-life Grant Wood landscape painting. The trail system here features two lightly traveled loops, offering the backpacker six miles of trails and five different campsites to experience. Each of these primitive sites only has a picnic table and fire ring; water is available from the red spigot at the trailhead. There are no fees for the hike-in sites and they are first-come, first-serve. Late spring (after turkey season) and early fall (before deer season) are the preferred times to do this trip. Summer hikers should wear long pants and bring plenty of bug spray.

East Loop—Grey Squirrels, Turkeys and Wondrous White Oaks

Across the road from the parking lot is the Turkey Foot Trail, named after a wild turkey recovery effort in the 1960s when the Iowa Conservation Commission stocked wild turkeys from Missouri into Stephens State Forest. The birds quickly reproduced and were later relocated throughout southern Iowa. Highlights along the trail include a bottomland forest, grey squirrels and white-tailed deer dashing through the trees and several intermittent streams that cross the trail. The streams can be difficult to ford after a good rainfall, so visitors should plan their trip accordingly. This three-mile loop can be strenuous at times, but hikers will be rewarded with the opportunity to sleep beneath beautiful white oak trees at all three backpacking sites along the trail.

West Loop—Bountiful Berries and Whip-poor-wills

The West Loop features similar picturesque scenery, sentinel white oak trees and lots of birdsong. Following the Shagbark Trail west out of the parking lot leads hikers to an open field where, in the summer months, raspberry and blackberry bushes provide the weary hiker with a tasty food source. A majestic 100-foot cottonwood tree marks the stream crossing at the other end of the field. Visitors who desire to hear the wind blowing in the pine trees or whip-poor-wills at night should camp at the Buckstop Campsite. From there, the

The Woodburn Unit of Stephens State Forest features a rugged backpacking loop that traverses a forest of majestic white oaks. Six miles of trails and five primitive pack-in campsites are found here in south-central Iowa.

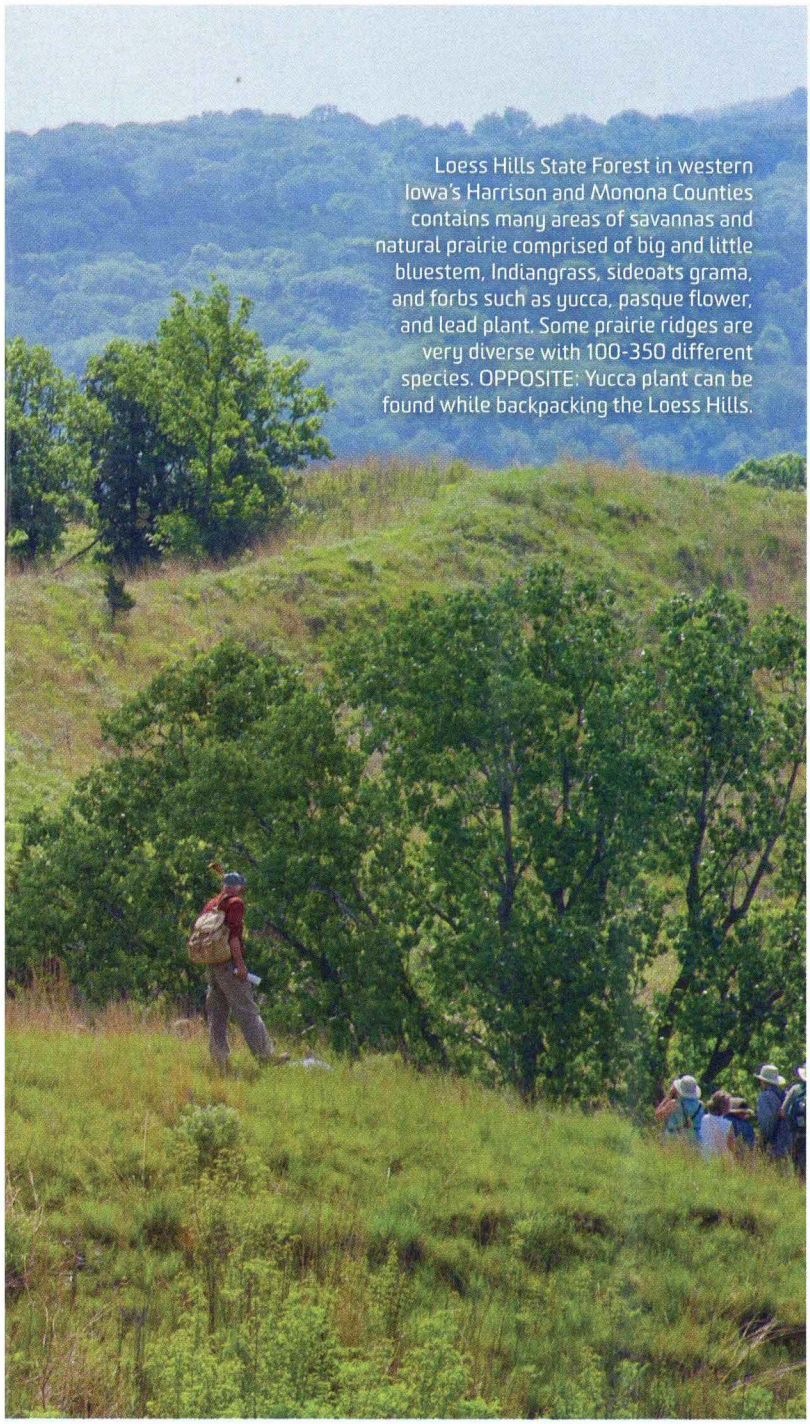
path winds down to an idyllic spot aptly named "rock crossing," which is perfect for hikers to rest their feet and look for fascinating rocks and fossils.

Camp in Iowa's Most Unique Natural Treasure

Outdoor enthusiasts looking for a truly Iowan backpacking experience should head west to Preparation Canyon State Park adjoining the Loess Hills State Forest. With five miles of well-kept, moderately strenuous trails, 10 backpacking campsites and no roads, Preparation Canyon is truly one of our wildest places to explore.

Located off the Loess Hills National Scenic Byway near Pisgah, this 344-acre park was once a gathering site for Morman settlers in the 1850s. Today, the lightly visited park features wide open views of the surrounding windblown knolls known collectively as the Loess Hills.

Rising more than 200 feet above the Missouri River floodplain and measuring 15 miles wide by 220 miles long, the Loess Hills are a globally significant landform. Hiking along these hills allows visitors to reconnect to the tallgrass prairie ecosystem that once covered nearly 85 percent of the state before European settlement. From May through September, backpackers can walk among expansive fields



Loess Hills State Forest in western Iowa's Harrison and Monona Counties contains many areas of savannas and natural prairie comprised of big and little bluestem, Indiangrass, sideoats grama, and forbs such as yucca, pasque flower, and lead plant. Some prairie ridges are very diverse with 100-350 different species. OPPOSITE: Yucca plant can be found while backpacking the Loess Hills.

of prairie strewn with beautiful splashes of gold and purple wildflowers such as hoary puccoon, compassplant, coneflowers and blazing stars.

To register for a backpacking trip at Preparation Canyon, stop by the east parking area off of Peach Avenue. From the east trailhead, hikers can reach eight different primitive campsites within an hour's hike. Visitors looking for a more strenuous expedition can journey through the heart of the park to reach two primitive campsites on the west side. No matter where you choose to adventure in the Loess Hills, remember spring and summer days can heat up quickly, so hit the trail early and bring plenty of water and sunscreen.

Find Your Trail

Staying at a backpacking campsite is a rewarding way to experience the natural beauty of Iowa. The chance to camp in these unique, quiet spaces may not be for everyone, but the memories made will leave one thinking, who knew traveling Iowa on foot could be so beautiful?

For more information on backpacking sites found in Iowa's state forests, or to download trail brochures, visit iowadnr.gov. A phone call to the local state forester can also provide visitors with current trail conditions: Yellow River State Forest *563-586-2254*; Stephens State Forest *641-774-4559*; Loess Hills State Forest/ Preparation Canyon State Park *712-456-2924*.

Backpacking Essentials

- dress for the weather, don't forget to pack rain gear!
- stay on trail
- pack plenty of water
- remember insect repellant, sunscreen and to pretreat clothing against ticks with permethrin.
- bring a map
- pack matches or lighter in a waterproof container
- first aid kit
- wear blaze orange if hiking during hunting season
- knife, whistle and headlamp
- take only photographs and leave only footprints. Pack out what you pack in.
- leave an itinerary and contacts at forest office and your plans with loved ones.

Camping at Yellow River State Forest offers the chance to camp under a grove of eastern white pine trees. The species is the only pine native to Iowa and when settlers arrived, the trees were mainly confined to northeastern Iowa, but are widely planted statewide today.


IOWA
HAWKEYES
IOWA
HAWKEYE
STAN'S BAIT
OKOBOJI
LIVE BAIT & TACK

Hunting with Hawkeyes

STORY AND PHOTOS BY LIZ JACAVINO

An unexpected friendship with a retired elementary school principal helped players from the University of Iowa women's basketball team find interest and empowerment through hunting and fishing.

Makenzie Meyer will always remember her first time hunting doves. It was fall 2017. She and Carly Mohns hid, tucked away silently in a pop-up blind. They waited patiently for the first of the flock to take off. Meyer spent the early part of the season practicing on clay pigeons every opportunity she could. The first dove took off.

"I just went for it," says Meyer. "I didn't think I would hit it."

The sound from the shotgun vibrated in the air. The dove fell, lifeless. Meyer jumped up and screamed with excitement.

Building a friendship

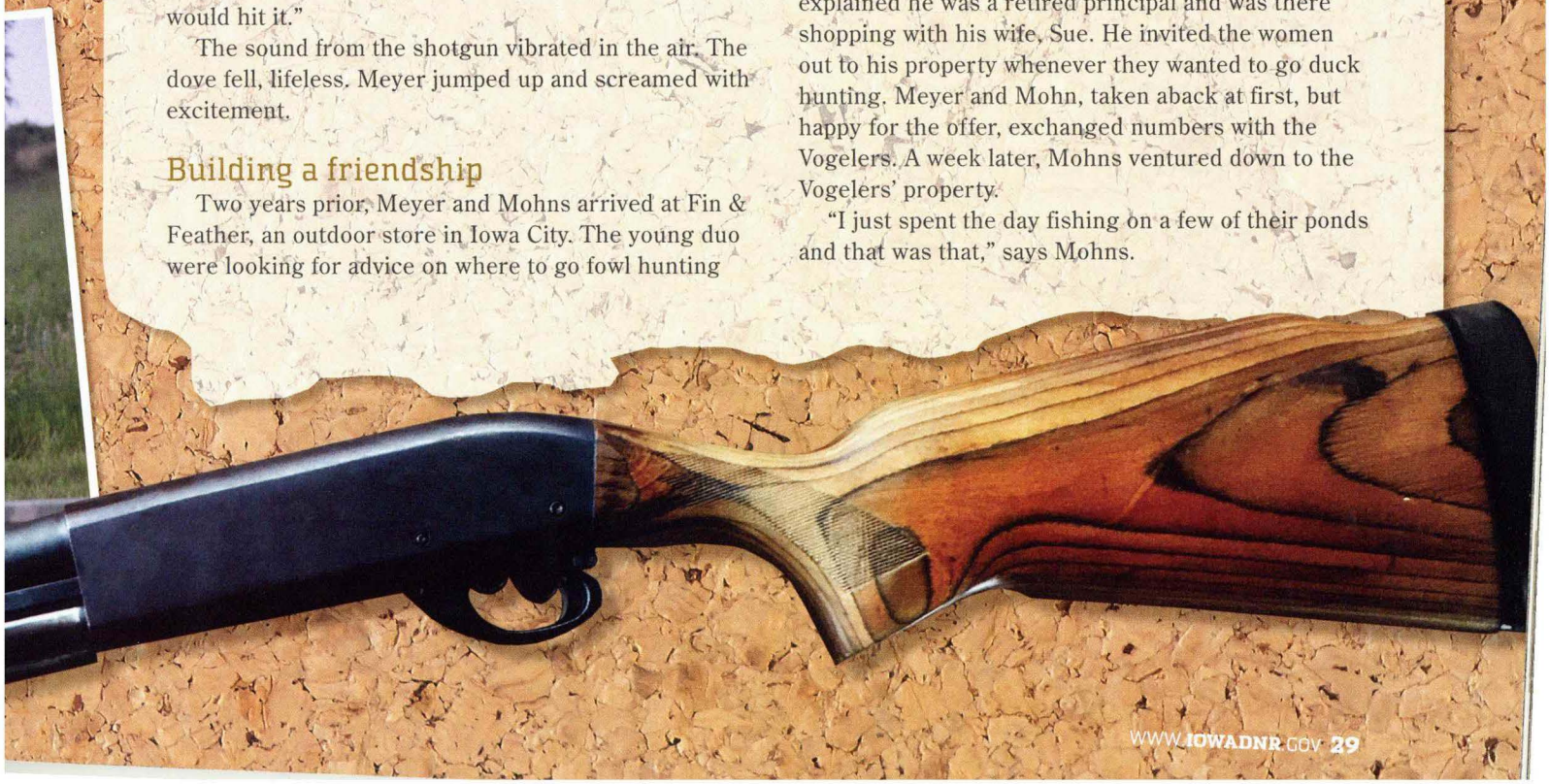
Two years prior, Meyer and Mohns arrived at Fin & Feather, an outdoor store in Iowa City. The young duo were looking for advice on where to go fowl hunting in the area and stepped up to the cashier hoping for an opportunity to get outdoors. Behind them in line stood Dan Vogeler, a retired school principal from Columbus Junction and avid outdoorsman.

"You girls looking for a place to hunt?" blurted Vogeler. "They probably thought I was just a dirty old man," he says.

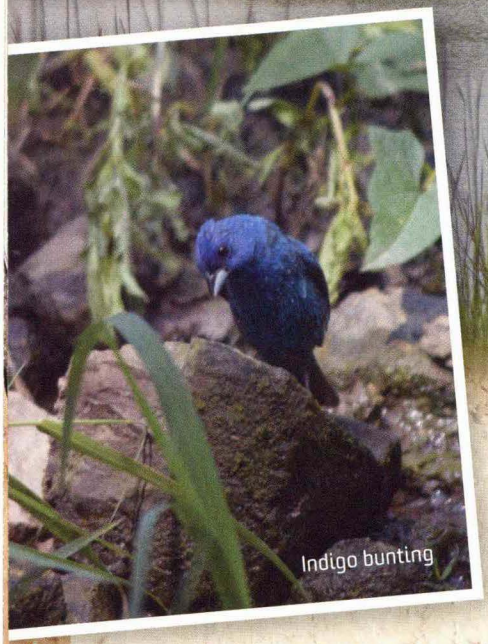
"This big guy with a beard came up to us and said, 'I know a place you can go hunting,'" says Meyer.

Vogeler introduced himself to Meyer and Mohns, explained he was a retired principal and was there shopping with his wife, Sue. He invited the women out to his property whenever they wanted to go duck hunting. Meyer and Mohn, taken aback at first, but happy for the offer, exchanged numbers with the Vogelers. A week later, Mohns ventured down to the Vogelers' property.

"I just spent the day fishing on a few of their ponds and that was that," says Mohns.



In Louisa County sits a wild 135-acre land where at any moment a flock of Hawkeyes might descend for some wild fun. Their power smashes clay pigeons, they feast on turkey and enjoy a fish fry from their latest catch. Members of the University of Iowa's women's basketball team feel their blood pumping with excitement and adrenaline.



Indigo bunting

Mohns wanted to return to the Vogelers' quickly. She wanted to show her teammate and friend just how incredible the land was. So, the next time she went to Columbus Junction, she brought Meyer. Dan drove them around the property on his Kawasaki Mule, showing them why others have named it "Vogeler State Park."

"Vogeler State Park"

Dan and Sue originally purchased the 115-acre land, rugged and overgrown, back in 2000. Work began immediately on the property as the Vogelers transformed the neglected land into their new home.

Dan tours his property, proud of nearly two decades of hard work and dedication while he spots a deer through the shrubs. After traveling a few feet more, a small pond comes into view. A crane spots the Kawasaki, glides off the pool into the air, and disappears behind the tree line, leaving behind small ripples in dark water.

A tour of the Vogelers' property takes about 45 minutes. There are fields of sunflowers, corn and wild fauna. A thick tree looms over one part of the trail.

"There's a hive of bees in there," says Dan, as he points to the swarm that crowds into the hole of a tree.

Dan and Sue installed purple martin homes in their backyard. Far off, deeper into the property, sits a platform that waits for an osprey.

Here, "it's an escape from the city and college," says Meyer.

"It's so relaxing there," says Mohns. "It was like my escape place to go fishing and hunting."

The Vogelers' 135 acres in Columbus Junction is quite well known by townsfolk. The couple makes their own maple syrup, plays host to children's camps for the day and works with local conservation groups, giving advice on environmental practices.

"It was just so beautiful," says Meyer. "I knew I wanted to keep coming back."

After that, the women found the Vogelers at every home basketball game. They even traveled to Ames when the Hawks took on Iowa State.

"He's like the team grandpa," says Meyer.

And when the Hawkeyes show up at the Vogelers' front door, they know they'll be greeted with Sue's homemade meals.

Team Empowerment Through the Outdoors

Mohns remembers fishing with her father almost every day growing up. She can't remember exactly when they started, but it soon became a time to bond and relax. For Meyer, she remembers her father going out and hunting during her childhood, but she never joined. Her father, uncle and brother set out on fall mornings to go hunting. Meyer mostly went fishing and when she met Mohns, they both realized how much they enjoyed the outdoors. Meyer's first dove hunt glimpsed at the excitement that came from hunting.

"It's the same adrenaline rush as making a three-point-shot in Carver-Hawkeye Arena with the crowd going wild," says Meyer.

"I'm not a morning person," says Mohns. "But when I would go hunting I was always excited. I got to see the sunrise and be surrounded by wildlife."

"It's a way to escape and to take a break from reality," says Meyer. "I get to see the forest wake up."

Vogeler took all precautions when teaching the two women how to handle guns. He made sure they took their gun and hunter safety courses before he took them out.

"I'm holding a dangerous weapon that takes knowledge and skill," says Meyer. "I feel powerful."

"Especially being a female it makes it so much sweeter when you hit a clay pigeon or something when the guys couldn't," says Mohns, a true hawk-eye behind the barrel.

Mohns brought team members down for her birthday, curious to see the blooming friendship with the Vogelers. The women spent the evening fishing and feasting.

"It's funny bringing newbies out to fish. They wouldn't want to touch it, but then after a while some of them found

Bees in a "honey tree."

Dan Vogeler

it really fun," says Mohns.

"A lot of the girls had never fished before," says Meyer. "And then they'd say, 'It tastes like chicken!'"

Some of the women were surprised to find out they had caught dinner.

"...one of the girls was loading her plate and I told her she had probably caught some of these fish," laughed Sue. "She couldn't believe it. Her eyes were so big."

After the fish fry, it was clear why Mohns and Meyer found themselves here so often.

"They're just the nicest people ever," says Meyer of the Vogelers. "Everyone was kind of interested [in fishing] after meeting them."

A Passion for Outdoor Sharing

The Vogelers' spent their lives dedicated to others. Both school teachers, they've shared the outdoors with family members, children and collegiate athletes. They both agree that this world is too beautiful for only a few to appreciate.

"One of my best accomplishments is exposing these girls to the outdoors," says Dan.

The women he's mentored are equally grateful for their friendship.

"Dan is someone you can talk to about anything," says Meyer. "He's like a relative."

And for Mohns, repeatedly injured and unable to play, she says finding the Vogelers' provided her an outlet.

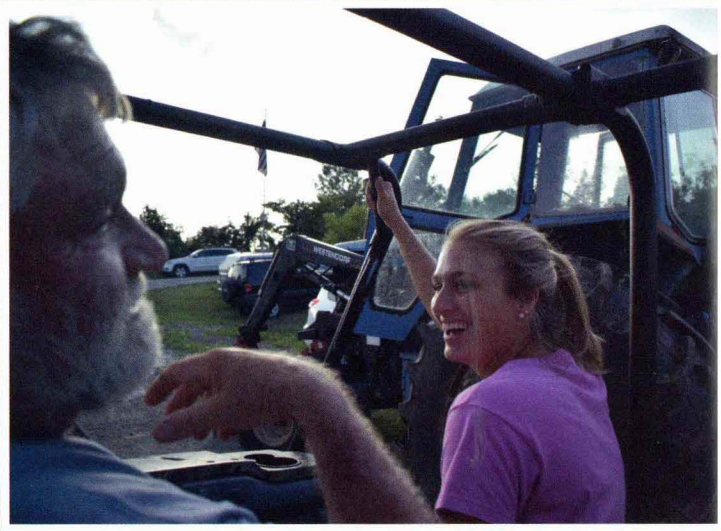
"It was like my saving grace," says Mohns.

And for the Vogelers, they just feel blessed to know these wonderful women.

"It's fun to see what well-rounded women they are," says Sue. "It's amazing what these girls do: the hours of practice, weight lifting, visiting the children's hospital and volunteering."

"It's an eye-opener seeing what these women go through being in a Big Ten sport," says Dan. "These girls hardly have time to devote to hobbies."

After meeting Mohns and Meyer, the Vogelers opened their home to the whole basketball team. They make sure every woman knows they are welcomed anytime. The Vogelers regularly attend basketball games, cheering from the stands. They step in when families can't come to a game. They make a point to meet parents and have brought a few down



to Columbus Junction. The Vogelers' created a little escape from the student-athlete life.

"It was like my second home," says Mohns.

"It's a way to escape and take a break from reality," says Meyer. "It's an opportunity to get out of a college town."

And eating a helping of Sue's home-cooked meals definitely helps.

"Our house has become a getaway from college pressures," says Sue.

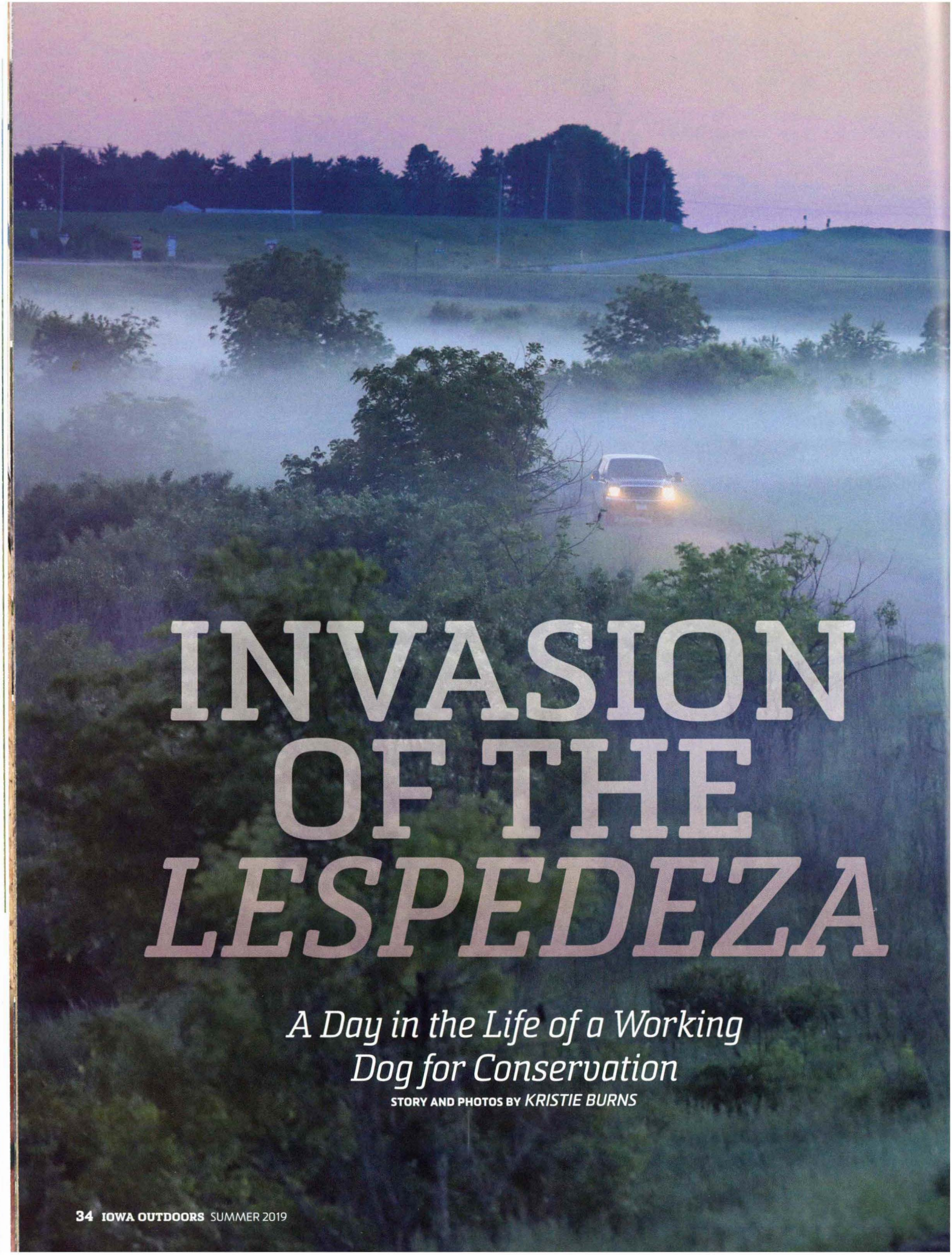
A one-in-a-kind friendship, the Vogelers, Meyer and Mohns will always share those happy memories.

"It's a neat friendship and we've gotten really attached," chimes Dan. "I look forward to see where life is taking them."

"... he's there for counsel and as a friend," says Meyer.

"It was my escape place," says Mohns. "They would just support what I did in actual life, not just in hunting and fishing."

No doubt "the adopted grandparents" of the Hawkeye women's basketball team will be in the stands for years to come, always ready whenever needed.



INVASION OF THE *LESPEDEZA*

A Day in the Life of a Working Dog for Conservation

STORY AND PHOTOS BY *KRISTIE BURNS*

It has all the elements of a good science fiction novel—an invasive species that hides in darkness and tries to take over native species using deception and disguise. It has all the elements of a good superhero movie—superheroes that work under the light of the moon and a veil of fog using superpowers that go beyond human ability.

However, this story is not science fiction—it is pure environmental science.

At night, the invasive species *Lespedeza cuneate* (Chinese bush-clover) hides beneath the cover of taller prairie plants, slowly taking over the prairie ecosystem, emitting chemicals that inhibit growth of other plants, preventing pollinator plants and healthy prairie grasses from thriving on the Neal Smith National Wildlife Refuge, 20 miles east of Des Moines. Its deception is taken a step further because it closely resembles the native *Lespedeza capitata* (round-headed bush clover) and remains hidden from human eyes until it is time to release its seeds into the environment. By that time it is too late and the damage has been done.

Refuge biologist Karen Viste-Sparkman shares that this invasive species has even adapted to many traditional methods of eradication. She says, "This species is adapted to fire. It will just grow, and when you burn it, you actually get more because the seeds are stimulated to grow when you burn it. Just everything we usually do makes it grow and spread more."

All these factors make *Lespedeza cuneate* a formidable foe. However, they are no match for our champions.

Lily the Labrador eagerly jumps out of the 4 x 4 onto the prairie just as the sun rises. She is eager to start a day of tracking down invasive plant species to protect the prairie. The work day starts before sunrise for biologist Melissa Steen and her two tracking dogs, Lily and Utah. The cooler early morning conditions helps the team stay cool during hot summer days.

This morning two trackers will take on their first mission—the challenge of hunting down these invaders and marking them so the refuge staff can eliminate them. But these trackers use superpowers that humans lack. They have 220 million olfactory receptors in their noses (compared to only 5 million in the average human's nose) and a brain that dedicates 40 times more space to analyzing smells than the average human. They hunt using "scentscape" rather than vision.

For these trackers are not human, but two canines—Lily, a Labrador retriever, and Utah, a border collie—who work with their handler, biologist Melissa Steen, to locate this invasive species. Among more than 200 native species on the Neal Smith National Wildlife Refuge, Lily and Utah have the ability to smell and track down just one—*Lespedeza cuneate*. And according to the Working Dogs for Conservation website, their dogs can even detect weeds before they break the surface of the earth.

Their website describes their skills in more detail saying, "Dogs' noses are designed so that they can smell continuously (not just on the inhale, as we do). They can determine which nostril an odor arrived in first, which helps them locate a scent in space. They even have an additional olfactory organ—and dedicated processing center in the brain—devoted just to scenting pheromones."

"If you make the analogy to vision," says James Walker, former director of Florida State's Sensory Research, "what you and I can see at a third of a mile, a dog could see more than 3,000 miles away."

While the *Lespedeza* lurks in the tall prairie grasses, Utah and Lily stretch their legs out of their dog cots and enjoy breakfast with their handler, Melissa Steen.

Melissa throws back the covers at the Super 8 and starts their day at 4 a.m. by brewing a cup of hotel Colombian and enjoying a bowl of yogurt or Casey's breakfast pizza. She fills Utah's bowl with his standard raw diet food and Lily's bowl with some high-quality kibble, with a rotation of extras like kefir, sardines and bone broth. Today they both get a bowl of bone broth as well to keep them hydrated. Although they start before the sun rises to avoid the heat, by the time they end their morning rounds the temperatures will reach into the 90s.

Melissa, Lily and Utah arrive to the refuge in their well-loved, dust covered 4x4 at about 5:15 a.m., just before the sun rises over the rolling hills and surrounding farms. A thick fog covers the ground, adding to the mood of excitement, intrigue and adventure. How many invaders will the team track down today?

The first order of business for Lily is to jump out of the truck and embrace the land by rolling in the dewy grass. Lily is one of the most enthusiastic workers one can meet. She is so excited to get out of the truck she jumps out before she's ready, getting outfitted as the sun starts to rise a little higher and reflects in the windows of the truck.

Like many superheroes, Lily has an adverse back-story to tell. By the time Lily was three years old, she had already lived in five different homes until a rescue in Georgia saw her potential as a working dog. The quirky nature and boundless energy that made her an unattractive pet have been her greatest asset as she works searching for endangered wildlife and invasive pests. She is trained to detect, track and show her handler 12 specific scents, including grizzly bear and white-footed vole scats.

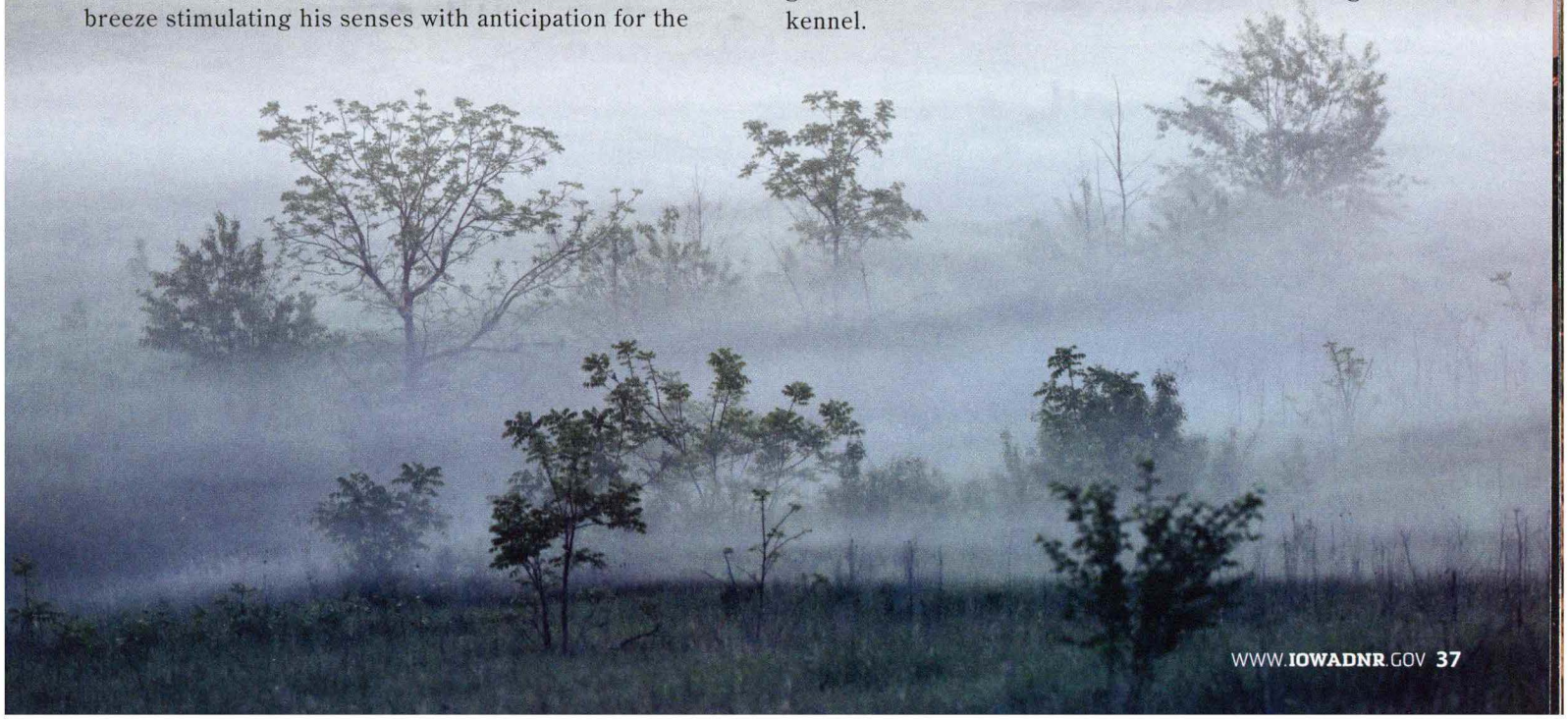
As Lily rolls in the prairie grasses, her entire body and face quiver and wiggle with pure joy. She becomes covered in the scents of the prairie but is soon ready to find that one specific scent she is here to detect.

But first, Melissa and Lily both need to make sure they are prepared for the day's work. They will be walking for up to four hours as the temperature gets hotter and hotter. They only take breaks for water. Still morning, Melissa's GPS shows that she walked 7.5 miles, and Lily's GPS showed that she walked 10.6 miles on rough terrain. On more even ground, these numbers can reach 12.4 miles.

Melissa's camel-pack style backpack includes water for the dog, a bottle of water for her, a first aid kit, a cooling cloth for the dog, a dog vest, a waist pack with a ball used as a reward for the dogs, a notebook to record information, flags to mark locations of invasive species, a GPS for tracking search and find locations, and a sample of the plant just in case the dog needs a reminder. Lily's preparations include a special vest that fits a GPS and a collar just in case Melissa needs to attach a lead.

Once Melissa and Lily are outfitted, they leave the truck and start at the section of prairie they are searching for the day. Utah stays behind in the shade with a cool breeze stimulating his senses with anticipation for the work to come. The sun is just starting to rise. Lily is in good hands with Melissa. Melissa graduated from Kansas State University with B.A.s in biology, psychology, and natural resources and environmental science. Since her graduation, she has worked in Zambia for the Peace Corps, as a vet tech, as a canine day care provider and gave animal care at Denali National Parks' sled dog kennel.

Water, dog vest, a ball to play catch as a reward for finding invasive plants and GPS gear to mark plant locations are carried into the field daily.



Refuge biologist Viste-Sparkman says Melissa's experience as a biologist is what makes this work team so powerful. She shares, "Having a biologist is a big advantage to us rather than just somebody who knows about dogs but can't necessarily do the rest of the work. You can tell Melissa knows how to record data and understands what she is doing. It isn't just numbers to her. You can tell she is connected to the data in some way and what we are trying to accomplish here."

The first half hour of their work is done under the light of the full moon. The rising sun behind them reflects a colorful painting onto the moon and clouds above the prairie. During this time, Lily is constantly sniffing her surroundings, moving ahead, then retracing her steps, searching for *Lespedeza* hiding in the tall prairie grasses.

An hour into their day, the sun finally peeks over the horizon and the temperature increases from 73 to 76 degrees. The prairie grasses are so tall that Lily cannot even be seen as she searches through the lofty plants. But Lily does not remain hidden for long. She enthusiastically runs from one area to another, sniffing intensely, hoping to find the invasive species she is seeking. This early morning work is refreshing when the weather is cool and the grass is wet.

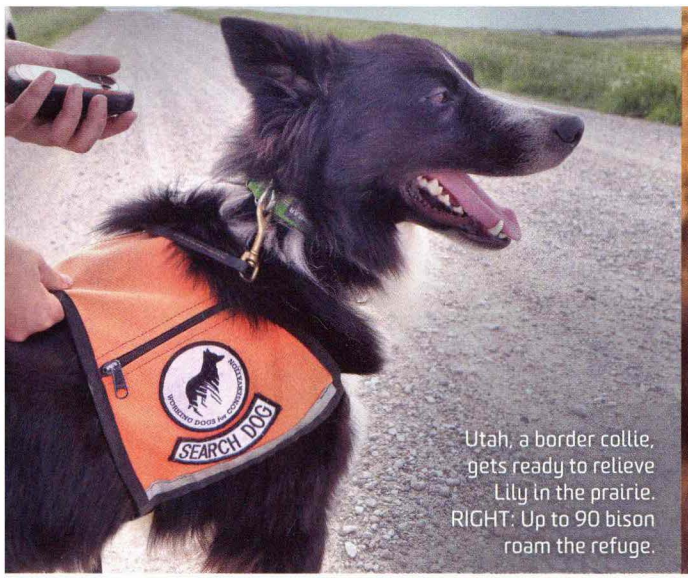
Lily stays happily damp from the tall prairie grasses for the first hour of the morning. This helps keep her cool and hydrated.

After a few short hours, Lily has tracked down two small, but destructive, patches of *Lespedeza*. The sun has already reached a much higher point in the sky and Lily's coat becomes dry and warm. Melissa unhooks the hose from her backpack and gives Lily a generous drink while also spritzing her head a bit with some extra water. The temperature has quickly reached 83 degrees. Although Lily enjoys this brief respite from the heat, she is deep into "mission mode" and eager to track down more invaders. One of the standard commands that Melissa uses with Utah and Lily is "go find it," which is their signal to start. However, they rarely need encouragement. Other commands she uses include "too far," "this way," "go find more" and "you got that one."

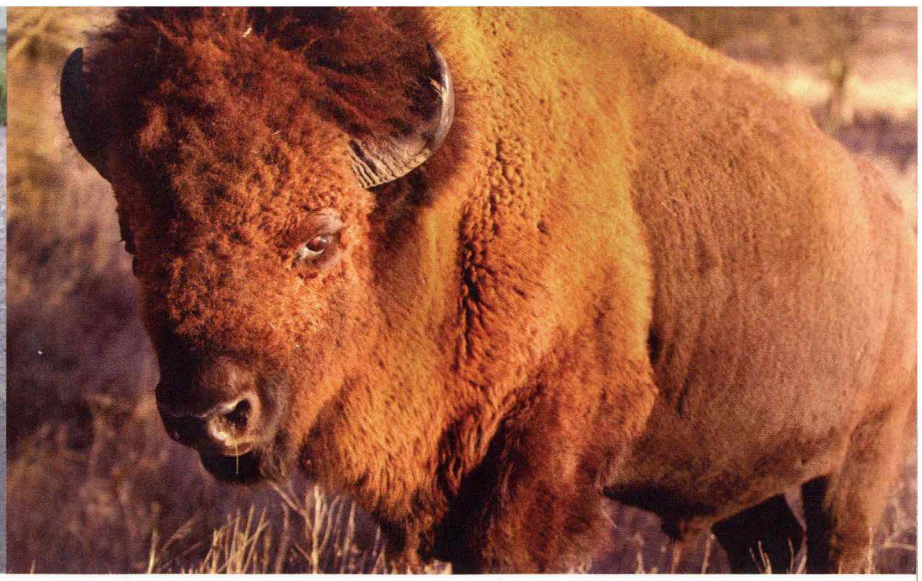
Watching Lily, I can see the fire of purpose in her eyes and her stride. She knows what she came here to find and nothing will deter her—not the meadowlarks that

The team often see the moon set as well as the sunrise since their day starts before dawn. Lily likes to start tracking as soon as possible and already has her nose down in the prairie grasses looking for the invasive plant species *Lespedeza cuneata* before the sun rises.

The dogs use superpowers that humans lack. They have 220 million olfactory receptors in their noses (compared to only 5 million in the average human's nose) and a brain that dedicates 40 times more space to analyzing smells than the average human.



Utah, a border collie, gets ready to relieve Lily in the prairie. RIGHT: Up to 90 bison roam the refuge.



sing in the bushes, not the pheasants that sometimes fly up startled in the tall grasses and certainly not the photographer who follows her around, often putting a camera in her face. If she wanders too far, however, Melissa uses the command "too far," and Lily comes back. After all, they have a grid to cover, and the area must be searched in an orderly manner. Yesterday, Lily found more than 60 patches of invasive plants. Today, however, there are fewer patches to find, so she has been wandering a bit further.

Melissa sometimes offers additional instructions or encouragement beyond basic instructions like "too far." Once Lily returns, Melissa puts up her hands and looks confused, acting as if she is desperately seeking help from Lily. Although Melissa must also be trained to identify the plants they are seeking, she must be careful to give Lily the impression that she doesn't know anything. This helps encourage Lily who wants to earn her treat (of playing with the ball) and also please her handler. This also helps avoid a situation where the detection dog may become lazy and just wait for their handler to find plants.

But even without commands and a mission there is plenty to keep the dogs, Melissa, and I alert on the prairie this morning. There are other challenges of the terrain to consider. The prairie is covered with dips, little valleys, bison wallows, ant hills, holes, and even little streams. Lily easily navigates nature's obstacle courses, jumps over a stream, and then turns around to encourage Melissa, who does not enjoy being wet as much as Lily does.

Today, a small herd of curious bison in the distance keeps an eye on Melissa and Lily. My job is to keep an eye on the bison while I am taking photos, making sure they don't get too close to our small group. However, our group is in more danger of stepping on some fresh gifts the bison left for hidden for us in the prairie flowers, rather than having any close-up bison encounters.

As the bison decide the dogs and humans trekking across their prairie are less interesting than grazing, they move away, and we move back towards the 4x4 parked on the road. It is time for Lily to get a break and Utah to start his work. Melissa makes sure her equipment is still working well, checks her GPS and refills the camel-pack with water.

Her GPS unit shows her where patches of invasive

species were found last time Working Dogs for Conservation did a survey and guides her in today's search. Viste-Sparkman says, once the survey is complete they send us a report with GPS points and what they found. "This also allows us to see how things are changing over time. So we can look at the end and compare and see what progress we have made."

Utah, the border collie, is just as enthusiastic as Lily when he knows it is time for him to do his important work. He jumps, wags his tail and does a little dance. It makes it challenging for Melissa to put his tracking vest on, but it soon gets done.

Not soon enough for Utah, though. He is ready to launch before the vest straps are even secured. There is a slight breed difference between how labs work, more far ranging, and border collies, who are smart, high-energy dogs but also conserve energy better. Utah joined the Working Dogs for Conservation pack in 2017 but is a standout in the group. He can already distinguish three scents, including the Chinese bush-clover he is seeking today. His "superhero" backstory is one of natural and unusual talent.

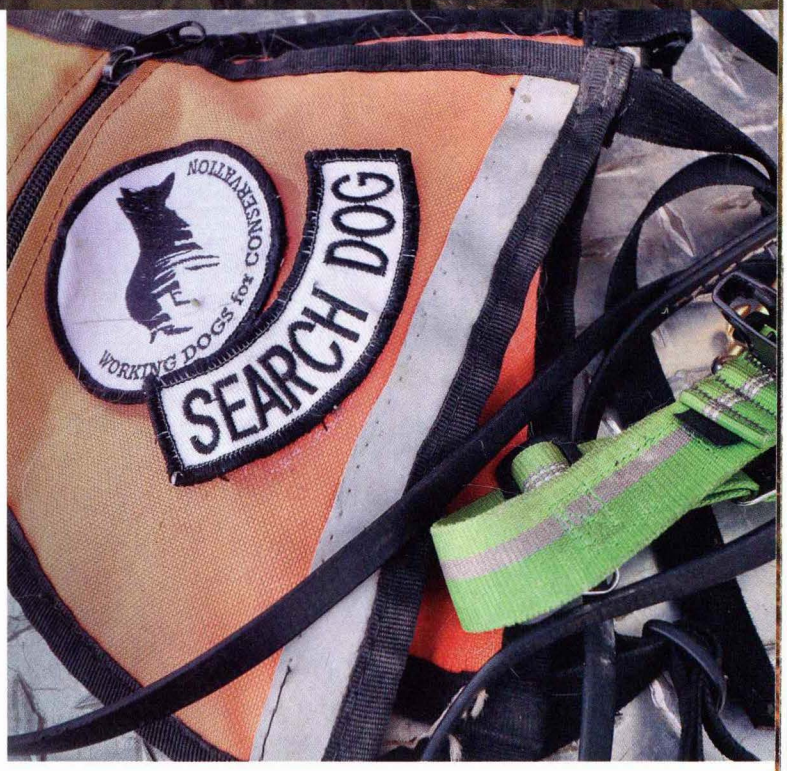
Working Dogs for Conservation says, "Utah started his training with human-collected kit fox scat. There is usually a learning curve when dogs move from bagged sample scats to ones 'straight from the fox'—collected samples can have a markedly different scent than naturally occurring scat, and field conditions can be confusing, with multiple wild canids using the same latrines. But Utah was ready to jump straight to the big leagues. He began alerting to wild scats his very first day in the field, and he hasn't slowed down since."

TOP: Utah, a border collie, wiggles when he knows its time to work. LEFT: Upon finding an invasive plant, Utah sits to mark it, with tail wagging and body trembling with excitement. After Melissa Steen flags the area, Utah gets to play with the ball she carries in her pack, a favorite prize he looks forward to.

Utah jumps onto the road, eager to start, and Melissa finishes the preparations by slipping Utah's GPS unit into his vest. Utah is ready. He wants to start—but where is Melissa? He checks. Because he is the newest trainee he tends to stay nearer to Melissa than Lily does. He's also a well-trained dog and knows he needs to wait, but he is just so excited! He can hear the sounds of a dickcissel singing from atop a tall prairie flower. He can see a few scattered bison in the distance. He can feel the warm sun hitting his back. It is now 86 degrees. But none of these things matter. All he wants to do is hunt down the invaders.

The wind picks up on the prairie, which is a welcome gift for the two humans trying to follow a very eager canine. He starts out close to Melissa, but gains more and more confidence. He soon ends up yards ahead of her. However, for Utah, this wind has more significance. With the wind blowing towards him, Utah can pick up the scent of *Lespedeza cuneate* more readily.

And it is only a matter of minutes before he finds his first patch. Utah is trained to find the plant and then sit down behind it with his paws around one of the plants. We see him sitting ahead of us so Melissa runs ahead to see what he has found. He is so eager to show Melissa his success that he can barely



contain himself. He is sitting in the proper position, but his tail is wagging, his body is trembling with excitement, his mouth is open and his eyes are earnest. He is eager to please, but also keen to play with the ball she is carrying in her pack, a favorite prize he looks forward to.

And what he has accomplished is no small feat. According to Viste-Sparkman, the refuge used to hire five interns to spend the entire summer walking through only part of the fields the dogs are able to cover. And even with the expanded area, the dogs are able to finish the job in less than two weeks. Not only that, but Utah has found a small *Lespedeza* plant that was completely hidden to the human eye by the tall prairie grasses and has managed to track it down before it started going to seed.

This is where Melissa's job comes to the forefront. She marks the area with a flag. If there is more than one plant, she will place the flag in the middle of the patch. Next, she records the exact location of the plant using her GPS. After that, Melissa records how big the radius of the patch is, how many plants there are, and how far away the dog detected it from.

Utah is so well trained that he waits patiently, but with

restless anticipation as she finishes up. Once the recording process is done, the moment Utah has been waiting for arrives. Melissa throws the ball into the air and Utah fetches it and brings it back.

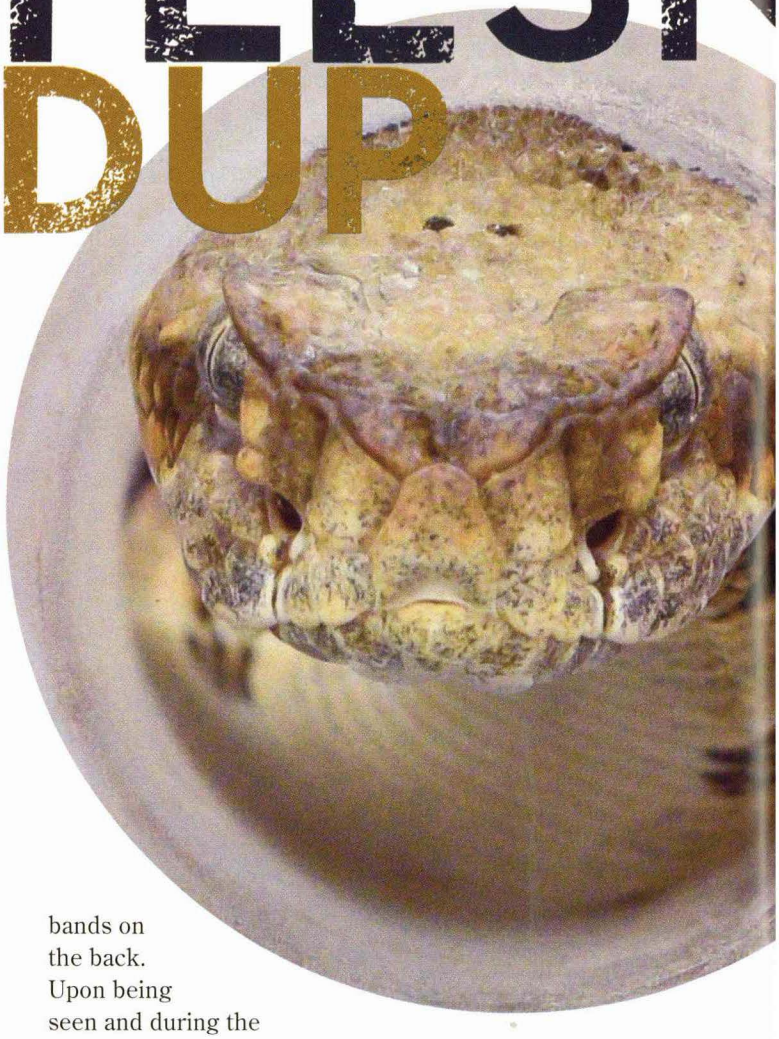
Utah leaps, contorts, and flies through the air to catch this treasured object and bring it back to his handler. How long he plays depends on how much work there is left to do, how dense the area they are searching is and the current temperature. As desired as the ball is, it could cause Utah to overheat, so occasionally other treats are offered instead.

The days are filled with hard work, adventure, joy and the defeat of an evil invasive species on the prairie. As is often said, "not all heroes wear capes"—in fact, this one wears a dog vest. Lily knows her value and strikes a hero's pose on a prairie rock as the day comes to a close. She might even be thinking of what comes next. After a long morning on the hot prairie, Melissa takes the dogs down to a stream to enjoy a swim while she enjoys some handmade ice cream at a local shop.

Our other prairie hero, Melissa, wears a backpack. But as the morning sun silhouettes her form, I think I might also see the outline of a cape.

Lily stands atop a rock near a bison wallow at the expansive 5,600 acre refuge. It used to take five interns an entire summer to cover just a portion of what the search dogs can find in less than two weeks. The dogs have found small invasive plants completely hidden by taller plants that humans could not detect.

RATTLESN ROUNDUP



Dedicated Wildlife Staff Work to Protect Timber Rattlesnakes from Potential Harm

A year ago in May, DNR wildlife staff ventured to a location where a population of timber rattlesnakes thrive—the specific location guarded to deter snake poachers that supply the reptile black market. The mission was to protect the snakes from a temporary earth moving construction project nearby. Snakes congregate here due to a place where they love to overwinter, an underground shelter, called a hibernaculum.

DNR biologists and technicians had previously put up erosion control fencing material, carefully staked to the ground to prevent snakes from traveling underneath into harm's way from soon-to-arrive earth moving equipment.

Today's mission—walk each foot of 4,800 feet of fencing perimeter to ensure it is still correctly in place and find any snake species that may have gotten through and return them to the safe side of the fencing. All snakes today would be measured and recorded.

The timber rattlesnake is only found in portions of eastern and southern Iowa. These beautiful, and over-feared, animals are surprisingly docile, timid and non-aggressive. They are the largest of Iowa's four species of venomous snakes, distinguished from all other Iowa snakes by jagged cross bands on the back. Upon being seen and during the capture process, most did not attempt to strike or rattle, but all tried to escape. After identification, measurement and upon release, they didn't show aggressive behavior either, but quickly sought to hide. (But don't use that as a rationale to attempt to handle them!)

The last fatality from a timber rattlesnake in Iowa was in the 1800s, but the bite is painful and can damage tissue and be fatal in some cases if untreated. Most bites occur when people stick hands under rocks, down holes or under logs or during dusk or night when snakes are active and accidently stepped on.

Staff intently scoured the area, exploring every patch of vegetation, rock outcrop, pile of brush and depression in the search for snakes. All told, four species of snake were found including six timber rattlesnakes, five racers, an eastern hognose and two milksnakes.

The Benefits of Snakes

In Iowa, there are plenty of animals that might frighten or startle you, but these animals have important roles in our

AKE

STORY AND PHOTOS BY *BRIAN BUTTON*

state's ecology. So if you are fortunate to see a snake, and even luckier to observe a rattlesnake in Iowa, don't panic, and consider what they contribute to the environment around you.

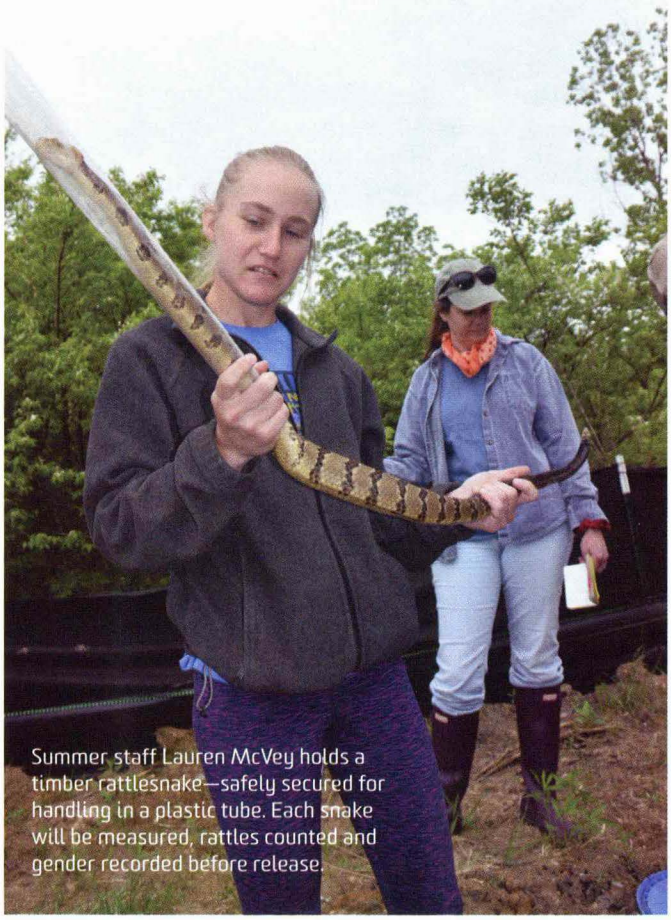
Nearly 30 species of snake in Iowa help keep rodent and small mammal populations in check. A snake can swallow animals and eggs bigger than its head—that's like a person swallowing a watermelon whole. From small snakes less than a foot long to large, 6-foot-long black rat snakes, Iowa's snakes vary in size to serve the needs of the ecosystem. Smaller snakes eat worms, slugs and insects, while larger snakes eat small mammals like mice and ground squirrels.

Iowa has only four venomous snakes, and their bites are rarely fatal if treated. The massasauga and timber rattlesnakes are rare, but found in eastern and southern Iowa. The prairie rattlesnake and copperhead are even rarer here. Only garter snakes can be legally caught, collected or killed in all counties. Timber rattlesnakes are protected in 14 of Iowa's 99 counties, excluding within 50 yards of an actively occupied residence. All other Iowa snakes are protected in all counties, and cannot legally be collected (without a scientific collector's permit) or killed.

I Saw A Rattlesnake—I think?!

Many non-venomous snakes— even though they lack a rattle—can mimic the sound of a rattlesnake. This often leads people to falsely conclude the snake is venomous when it is usually a harmless species. (Search YouTube for "fox snake rattle" to see.) The fox snake, found statewide, is most commonly misidentified due to their blotchy pattern and color and tendency to "rattle" their tail. The snake rapidly vibrates its rattle-less tail against dried leaves or grass to make noise. Other rattlesnake mimics can include bullsnakes, prairie kingsnakes and watersnakes.

Rattlesnakes have vertical pupils (like cat's eyes), non-venomous snakes have round pupils. Rattlesnakes have a "pit" (or hole) located between their eye and nostril which allows them to detect body heat, which non-venomous snakes lack. Iowa does have one venomous snake, extremely rare here, that lacks a rattle—the copperhead. It also has the pit between the eye and nostril, and vertical pupils. They are only in extreme southeastern counties.



Summer staff Lauren McVey holds a timber rattlesnake—safely secured for handling in a plastic tube. Each snake will be measured, rattles counted and gender recorded before release.

Food Delivery

According to herpnet.net, timber rattlesnakes consume small mammals such as mice, chipmunks, ground squirrels, voles, shrews and squirrels, even an occasional bird. They lay and wait, using many senses to detect a meal. They have been observed to lie coiled next to a fallen log with their head resting on the log. The log acts as a runway for rodents. As a rodent approaches, vibrations alert the snake of a possible meal. Eyesight and heat sensitive pits direct the strike. Prey is struck and released, then followed using scent trailing.

For more on any of Iowa's 27 native snakes, visit "HerpNet" at ***www.herpnet.net/Iowa-Herpetology/.***

Timber rattlesnake (*Crotalus horridus*)

This purple wartyback shell elated biologist Jen Kurth when she found it. "I was thrilled," she says. "I was sad when I realized it was dead, but fresh tissue was inside, so it was alive very recently." It was found in 2013—a drought year—and in the rocky habitat, the mussel couldn't make it to deeper water. The species hasn't been found alive in Iowa since at least the mid-1900s.

Biologist Jen Kurth holds a small, adult mussel and some juveniles while conducting a mussel survey along the Skunk River in southeastern Iowa.

Jen Kurth, a DNR natural resource biologist, has surveyed rivers to hunt for mussels like this since she was involved in undergrad research at the University of Minnesota. Her research on fish hosts started with the purple wartyback, a species of mussels on the decline in many of its native states.

"It's sort of like your first boyfriend. You'll always have a soft spot for them," Jen says as she recounts the time she has spent studying the purple wartyback.

The species that she had studied so closely slowly became extirpated, or in other words, extinct from Iowa. This led Jen on research with other species of mussels and conducting a six-year survey of the mussel population in Iowa where she found 37 species alive.

But then, there was a glimmer of hope beneath the wavy glass waters.

While surveying the Skunk River, she found what she calls a "freshly dead" purple wartyback. If she can find a living purple wartyback, the species would no longer be extirpated status.

An adult deertoe mussel.

The Hunt Begins

Jen intensively searches for mussels when surveying a river so the information is as accurate as possible. During the six-year survey, she rediscovered the slippershell species, which was also thought to be extirpated or locally extinct.

In graduate school, Jen was the first to monitor mussels by placing a Passive Integrative Transponder (PIT) tag on the shells of mussels. These half- to inch-long tags assign a specific number to each mussel tagged so they can be recorded and collected in the future. If inserted into the mussel next to the shell, the shell grows over the PIT tag as if it was to form a pearl, leaving the organism unharmed.

"It's the same kind of technology they use in dogs at the vet," Jen says.

She and her team would tag mussels as they moved down the stream.

"Tagging has allowed us to recover 80 percent of mussels versus a 29 percent recovery rate of what we visually found," Jen says.

Based on this survey, a dam in Maine was taken out to allow the native population of mussel to thrive.

In Iowa, many dams that were built to last 70-100 years have outgrown their life expectancy and are failing. For stream creatures, the removal of dams allows for fish passage, according to Jen. Mussels need fish hosts to flourish, so when the dams come out the fish and mussels can move up stream.

Struggling Mussels

The purple wartyback was once a historically widespread species, but has been on the decline, especially in Iowa's stretch of the Mississippi River. The biggest mystery for biologists is trying to figure out is what is hurting them.

"It can't be the host fish because they are thriving. They could be more sensitive to pollution or habitat loss," Jen

DNR endangered species coordinator Kelly Poole (in hat) and now retired staffer Mindy Kralicek pollywog, or search on hands and knees, feeling the sediment for anything that resembles a mussel.

Measuring a deertoe mussel

says. "No one has really looked into it enough."

Purple wartyback use catfish as a host fish. When mussels are in their larval stage of life, they are called glochidia. Glochidia harmlessly attach themselves to the gills of a fish until they are large enough to survive on their own. If the fish population is struggling, it would make sense that mussel populations would be as well, but they are not.

During the 1890s to the 1920s, the button industry was booming in Iowa. Mussels were being harvested in towering piles. Tile drains from agriculture were draining into the rivers and polluting the waters where the pollution-sensitive mussels lived below. On top of that, raw sewage was being dumped straight into the river.

Yet, they endured.

"I think the mussel population is amazing considering what we've done to them," says Jen.

Mussels in Their Natural Habitat

These introverted creatures contribute an immense amount to aquatic ecosystems.

Mussels are nature's water filtration system. An adult mussel can filter around 10 gallons of water per day. When people ask her if they can eat mussels, Jen always responds by asking if they would like to eat their water filter.

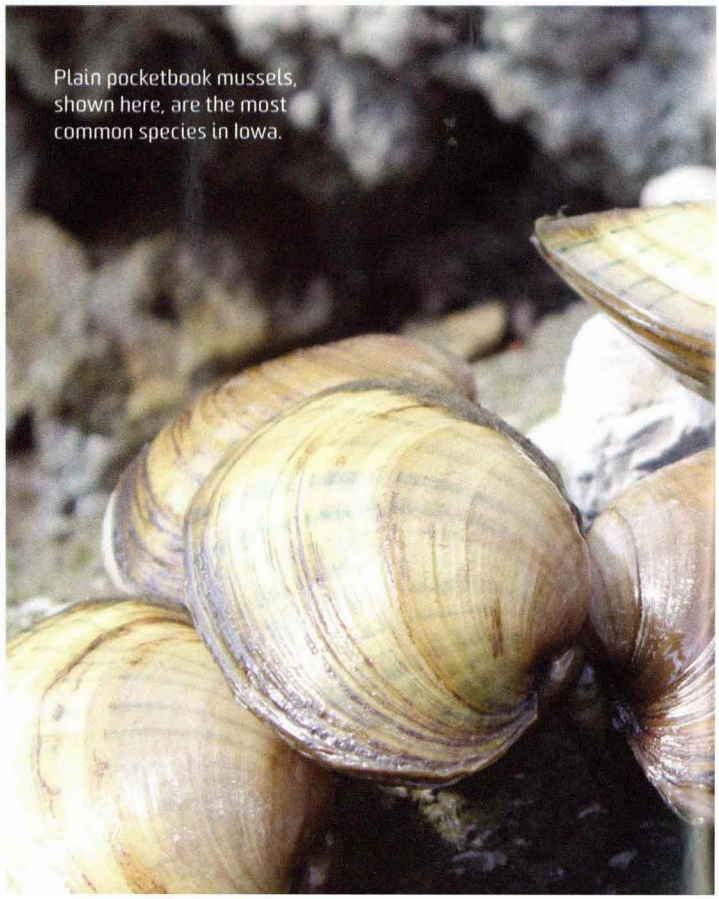
Mussels, although a humble species, are often called the keystone of aquatic communities because of their great influence on aquatic ecosystems. Dead or alive, mussels provide various invertebrates shelter.

They consume phytoplankton, bacteria, zooplankton and detritus and spit out much cleaner water that is crucial to the entire ecosystem and humans. In large numbers, mussels have the ability to filter an entire volume of a stream or lake, increasing the clarity of the water as well as recycling nutrients back into the ecosystem.

The Hunt Continues

To help learn more about these often overlooked and underappreciated species, Jen and her team will resume their hunt for the purple wartyback this summer. She has created a biotic index for mussels. This allows them to compare how mussels are doing over an extended period of time and across river systems.

And hopefully, they will discover that the elusive purple wartyback is hiding under the water somewhere, quietly at work filtering a stretch of Iowa waterway.



Plain pocketbook mussels, shown here, are the most common species in Iowa.

A pink papershell mussel lays in the foreground as staff sort, measure and record species. Twelve species were found that day, with 1,069 specimens total.

Mussel Blitz
on the Iowa River

The Iowa River, from the Coralville Dam to Hills, was the focus of last year's annual research project to inventory and map the distribution of Iowa's mussels, often called clams.

More than 50 biologists, students, county naturalists and volunteers collected 22 species of mussels in the Iowa River during the three-day event, held each August since 2005.

Live mussels were inventoried, measured for growth and then returned to the water. Most were found using a technique known as pollywogging, as researchers and volunteers crawl along a stream bed, probing the bottom with gloved hands. Trained divers inventoried deep water spots.

"These studies help us learn more about mussels and areas where they live and thrive," said Scott Gritters, fisheries biologist. "The Iowa River by Coralville is one of our most studied resources. We have tracked mussels here every few years since 2005 to watch population trends, including after the historic floods of 2008 and one extreme low water period."

The Iowa River mussel population does not appear to be as abundant as it was 10 years ago, but last year's Mussel Blitz documented pockets of rich and diverse mussel beds. Many areas of the Iowa River have few mussels, but short stretches are still very rich and diverse, Gritters said.

"The majority of the mussels were found in coarse gravel with one- to three-inch rock with very little sand," said Paul Sleeper, fellow DNR fisheries biologist responsible for managing this section of the Iowa River. "These stretches, easily searched in two to three feet of water, are perfect fish spawning habitat for shovelnose sturgeon and smallmouth bass."

Together, the Iowa DNR, U.S. Fish &Wildlife Service and the U.S. Army Corps of Engineers began researching the disappearance of native mussels 13 years ago. This includes searching for the federally endangered Higgins-eye pearly mussel. Once found across the Upper Midwest, this species has been eliminated from many rivers where they once thrived.

"About 54 species of native mussels were once found in Iowa. Now, there's about 42. Nine are endangered. Another six are threatened and several more are very hard to find," said Gritters.

Stretches of the Cedar, Wapsipinicon and Iowa rivers have been stocked in the past several years with walleyes and bass whose gills had been injected with the mussels' larvae.

"Stocking fish, something we commonly do anyway, is one way to reintroduce mussels into our rivers," said Gritters.

Mussels are a good indicator of the health of a river. The better the water quality, the more mussels. Mussels compact the algae they filter then kick out the crushed pellet to waiting fish; much like how fish are fed at a fish hatchery. Native mussels generally do not do well in soft substrates or fine sand. Dams which block migrating fish, also are a major hindrance to native mussels which are transported by hitchhiking on the fish as larvae.

"The whole river ecosystem runs better with native mussels living in it. Fish and mussels depend on each other," said Gritters. "Our fish populations and the opportunities people have to enjoy clean water improve when mussels are present."

GET INVOLVED

This years' blitz is on the Wapsipinicon River in Central City (Linn County) the week of August 19. To volunteer, contact biologist Scott Gritters at *563-872-4976* or *scott.gritters@dnr.iowa.gov.*

4 Cool Things You Should Know About Mussels

Most people have seen the empty mussel shell, but fewer have seen the actual animals that live in there. Get a good look before they're gone—these animals are some of the most threatened by habitat alteration and pollution today. **STORY BY** *JESSIE BROWN*

DANGER ZONE

Freshwater mussels are some of the most threatened animals in existence. Just in Iowa, nine species are endangered and six are threatened.

A statewide survey is currently underway to determine the status of mussels, as well as efforts to reintroduce them in areas where they have been wiped out.

LAZY LOVERS

Mussels don't move much, even for love. An adult holds on to the ground with a muscular foot, and moves as little as possible.

When mussels mate, the male stays put, releasing gametes into the water to be carried to females downstream.

CLING TO LIFE

Mussel larvae, called glochidia, are initially sheltered within a specialized chamber of their mother's gills, but they can't stay there forever. Larval mussels go through a parasitic phase in which they inhabit a cyst on a fish or salamander.

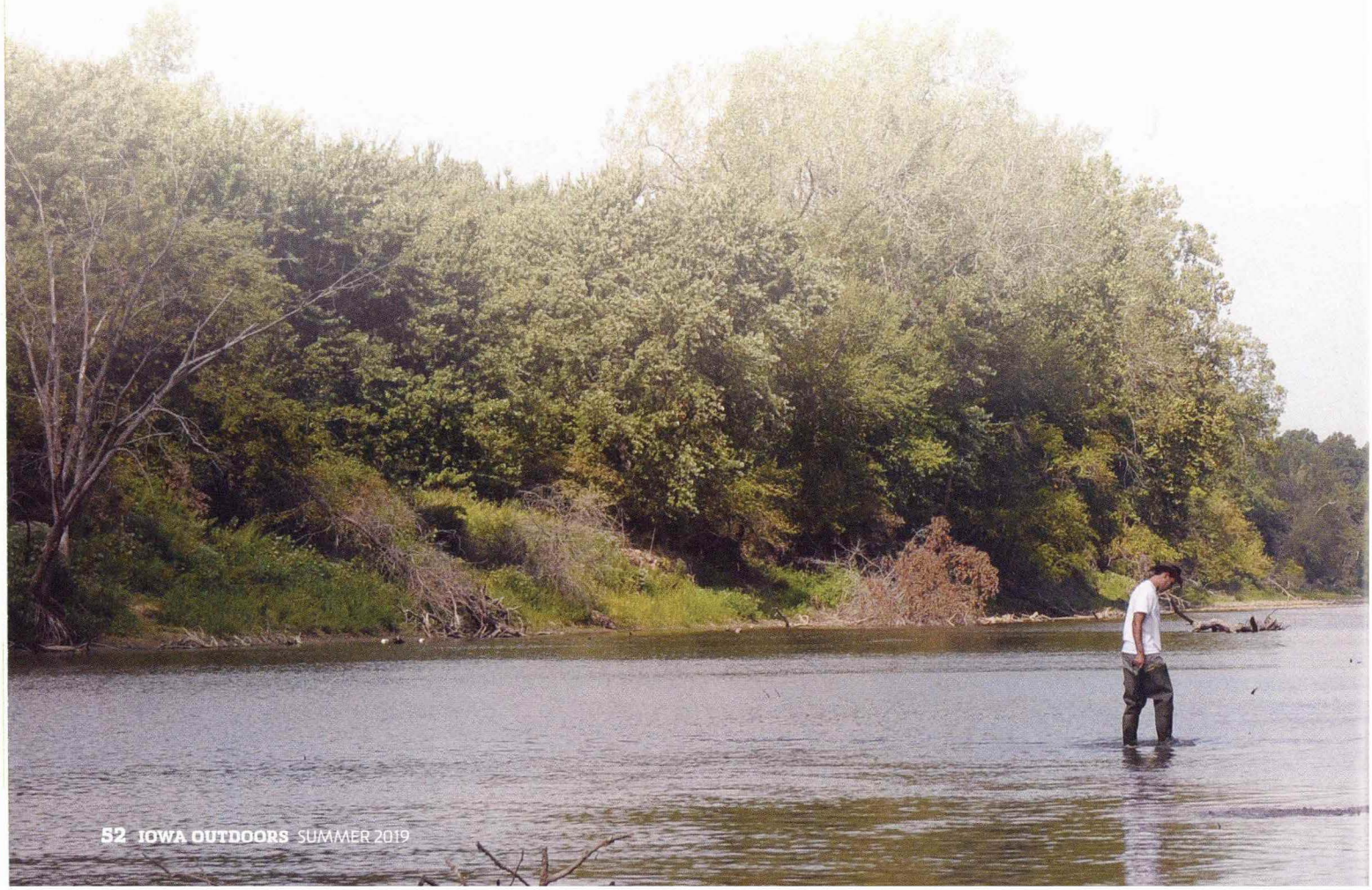
But to get from stationary mom to swimming host can be difficult, so some female mussels have a trick to get their fishy friends close. The glochidia-bearing mother extends a bit of her mantle out past the safety of her shell and wriggles it until a predatory fish attacks. Often this mantle flap resembles a bait fish, bug or even a crayfish.

The attack ruptures the structure holding her glochidia, which quickly attach themselves to the fish's gills and fins. There, the immature mussels become so entrenched that the fish's tissues grow over them, sealing them into safety. The process is not harmful to the fish, and after they have transformed into juvenile mussels, they fall off the gills, hopefully into suitable habitat.

CUTE AS A BUTTON

There are remarkably fewer mussels in Iowa today than a hundred years ago. Populations were heavily reduced in the early 1900s because mussel shells were used to make pretty mother-of-pearl buttons, and at one time there were 41 button factories in Iowa. It's estimated that 23,840 tons of shells were harvested from the Mississippi River in Iowa in 1899 alone.

These factories shut down with the introduction of cheaper plastic buttons in the 1940s, but a new market for mussel shells emerged in the 1950s with the growth of the cultured pearl industry in Japan. In order to get oysters (a sea bivalve) there to produce pearls, shells of mussels in Iowa were cut and polished into beads that could be inserted into the oyster's shell. The presence of the bead would irritate the oyster and cause it to cover the invader with layers of a solution called nacre, which eventually formed a pearl.



316 DUMP TRUCKS OF SEDIMENT

Iowa's freshwater mussels depend on good water quality, proper habitat and healthy fish to carry baby mussels (glochidia) to their future homes. So the number and types of mussels in an area—or lack of—tells a lot about river health.

And they've told DNR researchers a lot.

Buffalo Creek, a Wapsipinicon River tributary, flows from Fayette County southeast to Jones County. Five segments sat on Iowa's impaired waters list since 2008 due to problems supporting aquatic life—specifically, mussels. A 1984 survey showed a healthy number and variety of mussels, but by 1998, those numbers dropped by more than half.

In 2010, local communities came together through the Upper Buffalo Creek Water Quality Project, headed by the Buchanan Soil and Water Conservation District, to make changes on the land to improve water flowing into Buffalo Creek. A similar effort through the Middle Buffalo Creek project worked downstream. Landowners and farmers created grassed waterways, filter strips and planted cover crops to reduce erosion and runoff.

It reduced sediment by 4,417 tons a year—enough to fill 316 dump trucks. With that soil kept out of the creek, mussels bounced back.

A newer mussel survey, which ran from 2011 to 2017, found a significant increase in Buffalo Creek over the 1998 survey, including four species of mussel on Iowa's threatened species list. Many of the mussels were younger than five years old, suggesting conditions had improved. As a result, five segments of Buffalo Creek were removed from the state's impaired waters list for their aquatic life impairment.

Plus, the old Coggon low-head dam, removed through the DNR's Low-Head Dam Public Hazard Program, improved access and safety for paddlers and benefitted mussels and fish.

"The pool behind the dam was heavily silted, but Linn County's Buffalo Creek Park just upstream has river access and a nice little campground," says Nate Hoogeveen, DNR river programs coordinator. "When people catch on they can float downstream of the park, go through a short rapids and access pretty rock cliffs along Buffalo Creek below Coggon, they will have a great time camping, paddling and inner tubing. People love this size of little river. It'll bring visitors to town and adds an amenity to our state."

DNR fisheries staff anticipates fishing improvements as well. "It will take around two to five years to see how fish populations fully respond to water quality and fish passage improvements," says Dan Kirby, biologist in the DNR's Manchester fisheries office. "We expect to see some fish species formerly found below the Coggon dam will now be in upstream segments in Delaware and Buchanan County, including smallmouth bass."

Statewide, the DNR sampled 813 sites over seven years as part of the mussel survey, finding 39 different species, including two believed gone from Iowa. Prior to the current survey, 25 segments of Iowa streams and rivers were listed as impaired for mussel declines. As a result of the survey, 12 segments have now been delisted, and another two are proposed for delisting. The DNR also used survey data to develop a biotic index to more accurately assess mussels in waterways.

"We'll use survey data to make decisions about removing low-head dams and for wastewater permitting," says DNR biologist Jen Kurth, who led the survey. "We've also identified areas as good candidates for protection based on the excellent mussel beds."

Learn more about the Buffalo Creek project from the EPA, which selected it as a featured success story: *www.epa.gov/nps/nonpoint-source-success-stories-iowa*

The Tent

STORY BY *TIM LANE*

Changes in Tent Styles Make Writer's 1960s College Outings Look Campy

In June of 1969, my buddy Dave Dahmus and I founded a co-op. After all, everyone seemed to be organizing collective projects on one sort or another. There were communes, food co-ops, kibbutzim, and all manner of new arrangements. Why there was even talk of dorms on the UNI campus that would go co-ed (on separate floors of course).

The time was ripe for revolution and Dave and I opted to join the movement. So we headed to Sears. Our venture started there because we wanted to pool our resources and buy a tent. In those days, Sears was the place to get camping gear. That bit of knowledge pretty much summed up our collective knowledge about camping. Both of us had parents that were not camping enthusiasts and we thus grew up in Waterloo without significant wilderness experience. We would play in city parks, go to state parks for family reunions or the Fourth of July. But we had not been steeped in the ways of nature. My first tent was an army blanket placed over a card table in my living room.

Even as a Cub Scout our activities gravitated toward belt making or tourniquets as opposed to shelter and fire. But Dave and I both felt the call of the wild, or at least the call of Backbone, Ledges and Gull Point. Okay, we heard the call of the tame … but we still wanted to get out there and soak it up. And to be fully honest we also were, as college-aged men, heeding the call of women. Truth be told if there wasn't a chance to meet and invite girls over to "our place" camping would not have been so alluring.

So we signed a contract that we would be part owners of this tent and that the first one to marry would forfeit any claim to the facility. So the two of us became proud owners of a tent. For our first outdoor shelter we chose the 10-foot by 14-foot family model. We figured this behemoth could sleep 10, which was about how many it took to set it up. The box it came in could be described as a small casket. But after the first use, the thing didn't fit in that box anyway.

I already owned the necessary auxiliary carrying container for the tent—a 1955 Chevy. I always had to park on a hill in the winter but when she ran, my first car was a real beast of burden with a trunk that could warehouse the massive collection of canvas and aluminum.

As a chick magnet, our tent was a flop. But it was still the source of great fun. It went to Wadena. Friend Mike Hustedde brought along his future bride and Hedy thus did officially transform our abode into a co-ed residence.

By 1970, we had three pieces of camping gear. One humongous tent, one sleeping bag each and one "pie-maker." For some unknown reason, my mother possessed a device that clamped down over two pieces of bread and was a splendid utensil for making toasted sandwiches and pies. It transformed bread loaded with pie filling into warm and tasty pies that resembled flying saucers. The fact that plain white bread could turn into a very passable crust was

my first great camping discovery.

The device also worked well on our other primary food source—PB&J sandwiches. Our menus were limited to s'mores, bags of chips, sandwiches, cookies, apples and canned beverages. Although once we did attempt to fry eggs and bacon, but afterward reverted to bringing donuts.

So during our summer breaks from college, we would invite buddies Mike, Jerry, Jim or Randy to join our travel squad and head off to various state parks and reconnect with the coeds in the area we had met at college or perhaps new friends. Our motto was that every female stranger our age was a friend we hadn't met.

On these excursions our tent's biggest asset was exactly as we expected…its size. Today we could sell advertising on the sides of the thing. The tent also was a great learning tool and we quickly steeped ourselves in the arcane world of hydrology. The thing did not leak like a sieve—a sieve may have provided better protection. But once water found itself inside the tent, the canvas proved amazingly adept at keeping it in. We quickly concluded that our tent had been manufactured inside out.

We might not have had world-class accommodations, but we did have world-class fun. During the day we would swim, hike, climb, canoe, eat and then play 500. Several of us were minoring in the game in college. At night we would take in the stars and tell stories until Jerry Kelly was actually scared to trek down a dark path. Jerry was, in fact, the most imaginative and creative of our friends and thus susceptible. Or perhaps he was humoring us by appearing to worry.

These weekend excursions were amazing investments. If you divided our numbers into the costs, the weekend jaunts would rarely exceed single digits. If we spent $10 a head on gas and food we must have been splurging. But the benefits—as the old commercial says—were priceless.

After college and some travels via youth hostels, I returned to camping and made a quantum leap in tent technology with a Eureka Timberline and went from a tent weighing approximately 50 pounds to one weighing 5 pounds and 13 ounces. The fact that the ounces were mentioned alone set it apart from my first Barnum and Bailey tent. It was not only light, but dry! At night I would welcome rain and the accompanying calming sound effects it provided. But even though it would protect me from rain, it was not immune from deluges and the resulting streams that would flood the low lands as I found out one year in Spencer on RAGBRAI. After that, I would always tell folks—ad infinitum—that it rained so hard it was in tents (not sheets).

Back then tents had a door, window and poles. Today, tents have power slots for extension cords, self-connecting poles, vestibules, rain flies, back doors, divided rooms, carbon fiber, solar panels and all sorts of options. When I camped in 1970 I was technologically closer to the tents of Civil War soldiers that the space age options available today. Take the JakPak for example—a waterproof jacket, sleeping bag and tent you wear.

There are tents made from carbon fiber, tents that are popped up rather than erected, tents that hang from trees or cliffs and others with built in cots. The array is mind boggling and I must say that for the most part you get as good a deal now as then. My first lightweight two person tent lasted 20 years and nearly 200 overnights. The cost was thus under $1 per night. Plus the views and experiences were way beyond those offered in hotel rooms—these were memories of friends, fun and youth.

PHOTO: DNR ARCHIVES

Taking Count of the WILD THINGS

STORY BY **MICK KLEMESRUD**

The hours long, the work hard and no two weeks the same. Set traps, search for reptiles and amphibians, collect dragonflies, set and check mammal traps, help with bird and butterfly counts, and three times each week, record bat echo locations from 9-11 p.m. Week after week, rain or shine. But these summer staff get field experience to enhance résumés for grad school or to land a job and their labor yields valuable wildlife data for Iowa.

Eastern gray treefrog
(Hyla versicolor)

The makeshift conference room, normally a kitchen at the Chariton Research Station, was hosting six strangers from around the country who were starting their final day of training on how to collect data on the critters that call Iowa's wild places home.

This scene plays out each spring for Paul Frese, DNR wildlife technician, who works closely with summer staff as part of the Multi Species Inventory Monitoring (MSIM) program.

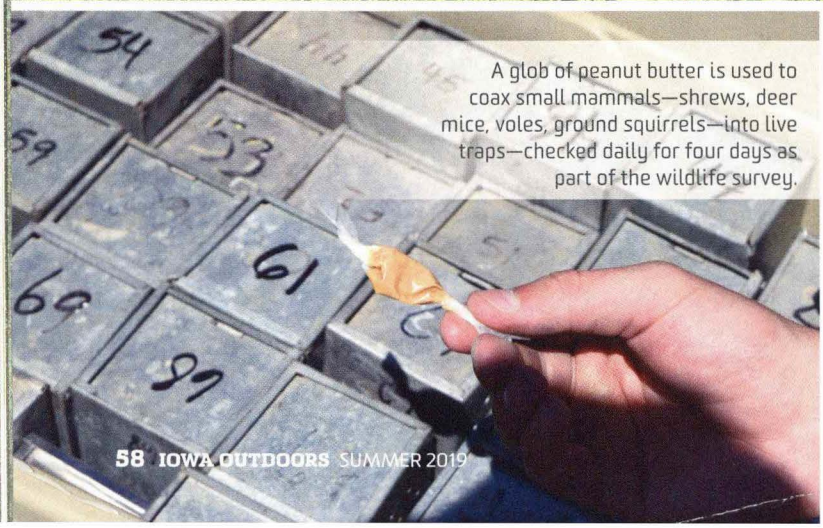
The program provides valuable data to land managers. It's identified six dragonflies never before found in Iowa, confirmed the Melissa blue butterfly had extended its range here, found a hispid cotton rat in Fremont County that had not been seen since the 1970s and the first nesting least tern on the Missouri River in modern times. It also serves as a training ground for future scientists. Once finished, Frese led them to an area just south of Red Haw State Park near Chariton to demonstrate how to set up survey sites, trap aquatic animals and identify signs of which mammals use the area.

Consistency is important when setting up sites, Frese says. Set at least 15 cover boards per site near older vegetation and away from trees for the best chance to attract reptiles. Cover boards are four-foot square sections of plywood placed randomly on an area to provide reptiles places to hide and collect heat—making them easier to count.

Each area has predetermined survey points marked on a GPS in the shape of a hexagon and each hexagon is oriented the same way—point one is in the center, point two is directly north and so on. Points on the hexagon are marked with PVC or bamboo stakes tipped with orange stake flags to make finding them easier. The same bamboo stake and flag combo is used to set butterfly transects—each area receives 40 flags, 10 meters apart, which brings Frese to the last piece of training—teaching new staff to know how many steps they need individually to hit 10 meters consistently.

Back in the parking lot, the six of them line up to walk along a tape measure to count their steps. A few sideways glances as Frese demonstrated, then, it's their turn. The scene is reminiscent of the famous Abbey Road album

At Kiowa Marsh in Sac County, DNR wildlife technician Paul Frese explains to summer staff how to collect small mammals using live traps on a breezy July morning.



A glob of peanut butter is used to coax small mammals—shrews, deer mice, voles, ground squirrels—into live traps—checked daily for four days as part of the wildlife survey.

cover, except for the grassy parking lot and Lucas County countryside in the background.

Starting next week, they will set up site visits and surveys and start collecting data on reptiles, amphibians, mammals, birds, butterflies and more. All six are college graduates. They will work together for the next few weeks until being joined by current college students in mid-May. Then together, they will be assigned to field offices across the state. They will remain in contact with Frese, who will guide and troubleshoot, teach and support them along the way.

The DNR, in partnership with Iowa State University, launched the MSIM program. The program is managed by the DNR's Wildlife Bureau, but program biologist Rachel Vanausdall is hosted by Iowa State University under professor Steve Dinsmore. Vanausdall does the majority of data analysis and paper writing, helps with training, conducts field visits, interviews and more.

"Everything we do with data is in partnership with ISU," says Karen Kinkead, MSIM program coordinator for the DNR. "Having academia on board is a really nice fit. Academia stays current with technology and on new ways to analyze data. And we have access to other scientists to solve problems."

After six weeks on the job, the work is coming more naturally for Kirsten Granstrom-Arndt and Erica Clark—two of the original six members of the MSIM staff. They've been assigned to the Prairie Lakes office and today, standing in the parking lot at Kiowa Marsh on the south edge of U.S. Hwy. 20 in Sac County, Frese meets with them and the new staff to see if they have any questions or anything to identify.

Tallying Carniverous Insects—Dragonflies and Damselflies

Frese is an expert on identifying Odonates—no easy task—as roughly 119 species of wildly colorful dragonflies and damselflies are found in Iowa. And when he arrives, the summer staff quickly gather around him with collected species.

"This one's a common whitetail, that one's a widow skimmer," he says, quickly identifying each. This question and answer session is an important learning part of the program. Discussion next turned to setting up the hex and avoiding the marsh on the 1,100 acre area.

"It's really fun and kind of surprises me how many animals are under the cover boards," says Granstrom-Arndt, Minnesota native and Winona State University alumnae. "Every day there's so many different things to see—like muskrats or deer—you don't realize they're there."

Clark, a Colorado native and 2009 Ithaca College graduate, worked at a cancer research facility in immunology for six years, but a growing interest in bird watching led to a career change. "I thought this job would be perfect to learn a little bit about a lot of things to see what I like most," Clark says.

It's that diversity that sets the Iowa program apart and makes it attractive to applicants. It's what brought Florida native Becky Buteau here. A 2016 graduate of Arcadia University, near Philadelphia, she worked in similar roles in other states but wanted this position because of its diversity. "This gives me the opportunity to learn everything," she says.

Buteau works her way through a tangled mass of tall grass and narrow trees searching for odonates and cover boards at Big Creek State Park north of Des Moines on a sweltering July morning. She holds a GPS in her right hand and butterfly net in her left. The area received 10 inches of rain a few days ago and with every step the ground squishes.

"I'm a lot more interested in dragonflies than damselflies," Buteau says.

Regrouping in the parking lot, they discuss what they found. Buteau had a reddish dragonfly she hadn't seen before, three red saddlebags, two widow skimmers, 12 spotted skimmers and one Halloween pennant. After the site review they head to Harrier Marsh, near Ogden.

Not everyone on the MSIM crew will be going on

Meadowhawk *(Sympetrum)*

Eastern pondhawk
(Erythemis simplicicollis)

to grad school. Others, like Brandon Silker and Tanner Mazanec, are looking to add depth to their resumes.

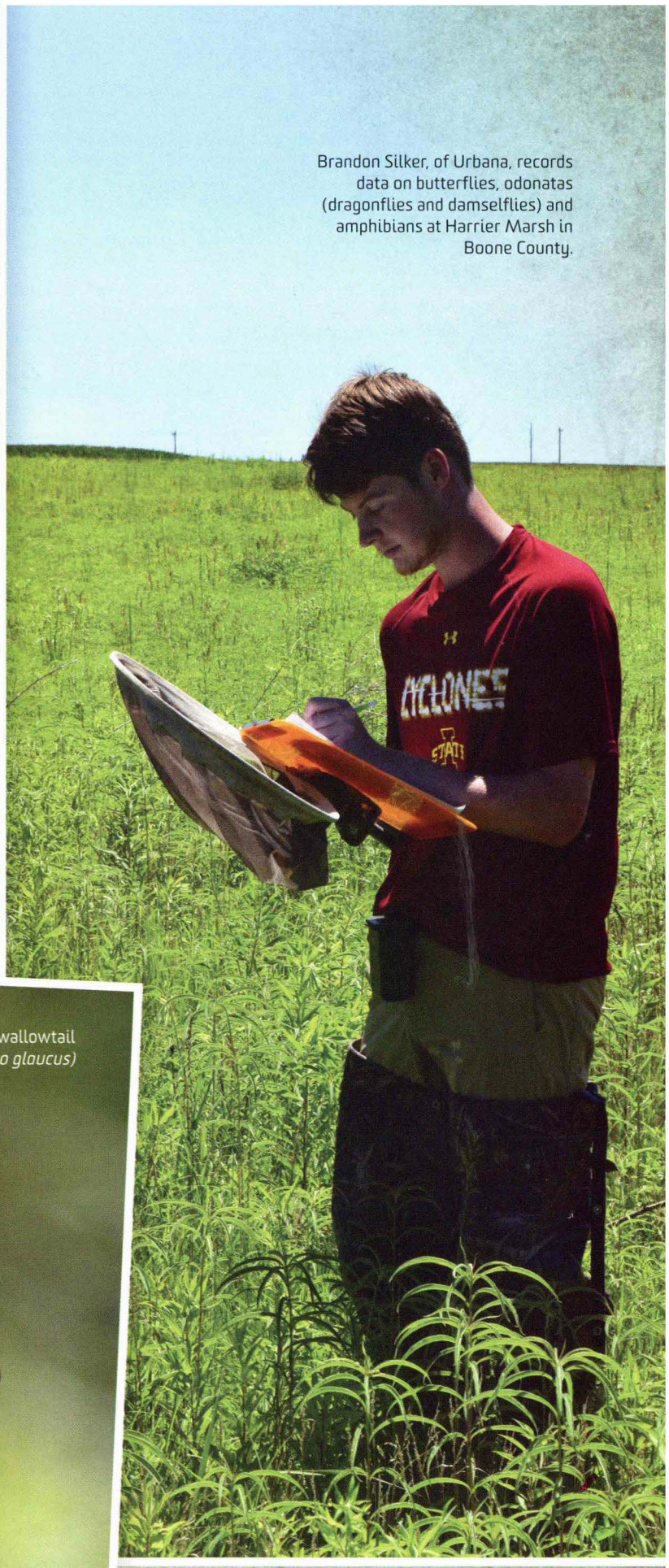
Silker, the only Iowan on the crew, is a 2017 Iowa State University grad. The Urbana native has three summers' worth of experience searching for nests for a research project and is his crew's primary birder. He uses his nest-hunting experience to point out two nearly invisible yellow-headed blackbird nests in the cattails with hungry babies.

The final site visit begins at the north parking lot at Colo Bogs, one mile north of U.S. Highway 30. It's a slow slog through heavy canary grass under a cloudless late afternoon sky. Mazanec, a 2017 Iowa State University graduate from Lino Lakes, Minn., is motivated to find rare or hard to find species. Today, he'd settle on finding any evidence that the bullfrog tadpoles, seen during an earlier visit, made it to adulthood.

His goal is to work as a field biologist, he says, and he's building his resume through a series of temporary jobs.

"They throw a lot of stuff at you," Mazanec says of his time on the MSIM crew. "Gotta get into a rhythm; find the best way to do the surveys, best order to do them."

Heading back to the parking lot, a female redwing black bird is dipping in to her bag of tricks to lure us away



Brandon Silker, of Urbana, records data on butterflies, odonatas (dragonflies and damselflies) and amphibians at Harrier Marsh in Boone County.

Eastern tiger swallowtail
(Papilio glaucus)

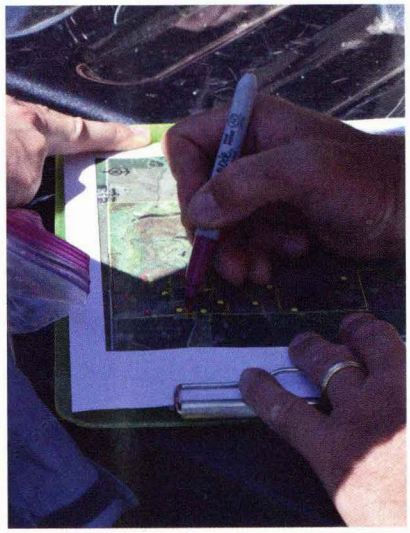
from her nearby nest. On this survey, the marsh produced dragonflies, butterflies, one common garter snake and zero bullfrogs. It's time to call it a day.

Recording what was found at each site on the day sheet is step one; step two is entering that information into a database.

"The database generates a formatted data set that we can stitch together, to estimate our population densities," says Kinkead. That's important because it provides records for area managers about what is living on a particular site so they can take steps to improve the conditions to benefit that species or stop practices that hinder it. The data can also create prediction maps based on the land cover, but there are still some data gaps like the management history of the area.

Data is collected on every taxonomic group and is used at the landscape scale to guide habitat preferences. So far, data on birds, dragonflies, butterflies and most recently, monarchs, have been examined.

"We wanted to provide the best, most accurate picture of Iowa so the majority of our sites were selected randomly—not targeting the best habitat," Kinkead says. "Even though surveys are designed for species of greatest conservation need, we collect data on everything. Our survey techniques are standardized so if we end tomorrow, the surveys can be replicated. Other states don't have that type of survey."



Join the Crew

The MSIM program looks to hire about 15 to 20 staff each year—more or less—depending on federal funding.

The job announcement is sent after Thanksgiving to colleges in Iowa and elsewhere. The description outlines the breadth of the survey which attracts interest from around the Midwest, to California, Maine, Virginia, Michigan and Canada. They receive about 70 applicants annually.

What rises to the top are applicants with the "'ologies"—mammology, ornithology, entomology, biology, etc. that shows the candidates can identify species they are looking for. Experience is also helpful. Candidates range from current college students to those with Master's degrees to people looking to make a career change.

MSIM alumni have gone on to become a college professor, a medical student, started their careers at the USDA Natural Resources Conservation Service and Pheasants Forever. Others have continued in the field of research, joined the DNR full-time, or taken positions with other state conservation agencies across the U.S.

No matter where or what they are doing now, the summers spent traipsing Iowa's wild places to tally and identify species great and small not only helped these young adults prepare for their future, but helps paint a more complete understanding of the diversity and numbers of species residing here.

ABOVE: DNR wildlife technician Paul Frese quizzes the MSIM staff on odonata identification at Colo Bogs in Story County. Frese provides expert insight on what to look for on hard to ID dragonflies.

BY JESSICA MONTANA, FIELD OFFICE SUPERVISOR, ATLANTIC

HAMBURG TOUGH

With confidence and strength during the winter floods of 2019, Hamburg Mayor Cathy Crain asks, "You want to see what we are about? You want to see what Hamburg is made of? I'll show you."

And she did.

Flooding hit Hamburg in 2011 too, but what distinguishes the two is the preparation time. In 2011, advance notice helped prepare communities for flooding. In 2019, it just hit. And it hit hard. Adding insult to injury, it hit in March, three months earlier than in 2011.

Instead of a usual day at the office or job, people were cleaning—no, gutting out—their homes. Sofas, armchairs, coffee tables, refrigerators, mattresses, siding, plaster and carpet—all laid curbside for disposal. Where a family should be gathering around a dinner table for supper, they were throwing out their dining room tables and contaminated food. Where restaurants should be buzzing with business, doors were closed or barely open. According to Mayor Crain, 88 percent of businesses were adversely affected—everything from the barbershop to hotel and hospital. Where a water treatment system should be providing clean drinking water to residents, the water supply operator and the city's public works director had not slept in days trying to remove water from the treatment building.

For everyone miles around, a cup of coffee, warm shower, doing a load of laundry or having dinner out at the café—all gone.

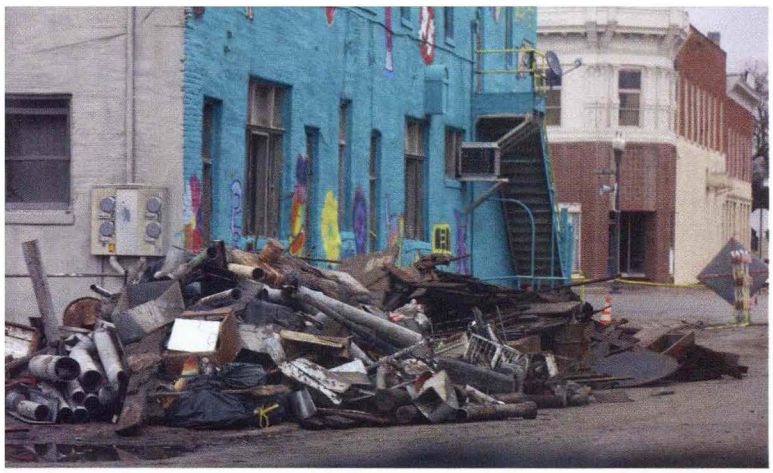
About 30 miles north, the City of Glenwood faced similar damage. The DNR Environmental Services Field Office in Atlantic was notified March 17 that the city began sandbagging its water treatment plant, a generator and was trying to protect at least one well from floodwaters. Realizing what might be happening, city officials tried to get storage reservoirs filled, giving them approximately 2-3 days' worth of drinking water. And, then, just like that, the Field Office was notified that nearby Pacific Junction was completely underwater. Because Pacific Junction gets its water from Glenwood and Glenwood's water treatment facility was flooded, the City of Pacific Junction was also completely shut off to conserve the remaining water in Glenwood's reservoir.

By March 18, Glenwood's water treatment facility and wells were underwater. The 4.5 miles between it and the Missouri River did not matter; approximately five feet of water inundated the facility. If you wanted to reach surrounding wells, you took a boat. That same day, Hamburg lost their water plant to flood waters and retirement community residents were evacuated, still in their nightgowns.

The month of March was grueling, exhausting and difficult for all involved. Each day re-defined what, "having a bad day" meant. The preciousness of a glass of water increased exponentially. The satisfaction of a hot shower non-existent. The comfort of one's own bed rendered priceless.

DNR Field Staff made camp in Glenwood and Hamburg to help get water treatment facilities on-line, working 15 hours per day, including weekends, to help residents across the area. New wells were drilled in hopes of maintaining pressure in the water system, ensuring people can at least flush toilets. Press releases asking residents to conserve, boil, or to not use water were issued throughout southwest Iowa for numerous communities.

Finally, on Saturday, April 13, approximately one month since the floods initially hit the western coast of the state, the boil advisory was lifted for Glenwood. Water samples collected



throughout the community and within all four schools indicated the water safe to drink. Meanwhile, tankers transported water to Red Oak, Shenandoah, Sidney and Omaha—more than 150,000 gallons per day!

After weeks, most—but not all of the water receded, and members of DNR management journeyed to meet with Mayor Crain and city officials. While most Iowans celebrated April Fools' Day with some joke or ruse, sights in Hamburg were no laughing matter. Enter the resiliency of Iowans.

The first stop the mayor took us was not to a swollen river, but the school—now a full-blown, functioning donation center. When I walked in, I was blown away. Like a beehive, the place buzzed with activity. People of all ages moved through the building—all with determination, focus and positivity. They were going to get through this event together. People flowed into the building with hefty sacks of potatoes, dropping them off in a marked spot along the wall with an already-existing pile of potatoes; others carried cases of pop, water and juice. As I trailed the mayor, I heard her say, "This is where people can get their food, well, where they can get anything." I saw stations set up throughout the hallway by category: toiletries, kitchen wares, baby needs, foodstuffs. And that was just the hallway.

Our group made its way to a room that may have served as the teacher's lounge before the flooding. Stacked boxes and plastic totes brimming with household goods lined each wall with baby wipes, lotions, soap, shampoos and conditioners. Then, in the center of the room, recently fastened together iron shelves provided storage for jars of peanut butter, jelly, canned soup, beans, corn and peas.

We stopped briefly to meet the mayor's sister-in-law, who humbly confessed she had been working 12-hour days to organize the copious amounts of donations pouring in. Truckloads packed to the brim. "You couldn't fit anymore in those trucks," she said.

While we stood in amazement, she shared a story of a woman who lived in Hamburg for a just a year, but had moved to North Carolina. When she heard about the devastation in Hamburg she decided to help. She loaded the bed of her truck and drove 1,100 miles to deliver bags and bags of pet food to Hamburg's furry family members. At this point, I could not hold the tears back any longer. She lightened the mood a little and added, "Plus I'm a little OCD, so this," she gestured towards the overall shelving and organizing, "this is a good fit for me."

We ventured into the school's gymnasium, which was organized expertly by category as well with clothing items, shoes and coats. On half of the bleachers were coats of all weights, colors, and sizes; the other half were shoes of the same categories. The floods took everything, even shoes. In the center of the gym floor were tables with nicely folded clothes, divided into categories—men's, women's, girls' and boys'. On the bleachers on the other side of the gym were diapers for young and aged, pillows, blankets and throws. All donations.

During our trip, I was taken aback by not only the overwhelming, generous donations from every corner of this nation, but, I was taken aback by their resiliency through it; the enormous support of and for each other.

The last vision before leaving town was a school bus in the Casey's parking lot. High school students, wearing orange vests, unloaded and gave out garbage sacks for clean-up efforts.

While leaving, it was clear that recovery would take time—months, maybe even years. However, the resiliency of Iowans is undeniable and the wave of goodness to be revered.

This is just a very small piece of a very big picture regarding the 2019 floods. There are many perspectives from others; many details with regards to getting wells in all communities back on-line and other's stories. This article is just one sliver of the story that affected Iowans. With that, my goal of telling this perspective is two-fold: extend a thank you for the DNR field staff and conservation officers who helped people in need including search and resuce operations and to share my small perspective of how wonderful I think Iowans are, even in their darkest and most trying moments.

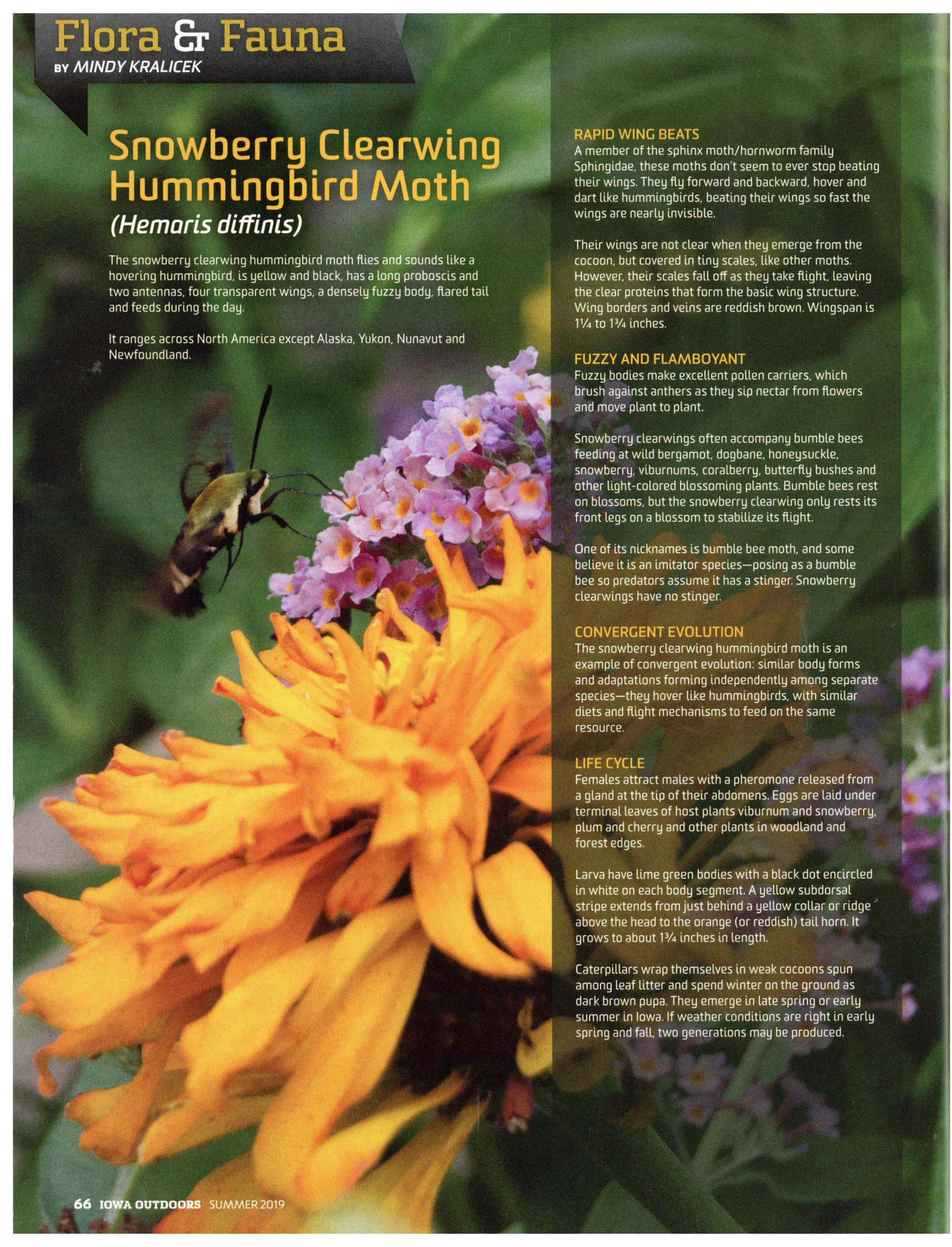
BY *MINDY KRALICEK*

Snowberry Clearwing Hummingbird Moth

(Hemaris diffinis)

The snowberry clearwing hummingbird moth flies and sounds like a hovering hummingbird, is yellow and black, has a long proboscis and two antennas, four transparent wings, a densely fuzzy body, flared tail and feeds during the day.

It ranges across North America except Alaska, Yukon, Nunavut and Newfoundland.



RAPID WING BEATS

A member of the sphinx moth/hornworm family Sphingidae, these moths don't seem to ever stop beating their wings. They fly forward and backward, hover and dart like hummingbirds, beating their wings so fast the wings are nearly invisible.

Their wings are not clear when they emerge from the cocoon, but covered in tiny scales, like other moths. However, their scales fall off as they take flight, leaving the clear proteins that form the basic wing structure. Wing borders and veins are reddish brown. Wingspan is 1¼ to 1¾ inches.

FUZZY AND FLAMBOYANT

Fuzzy bodies make excellent pollen carriers, which brush against anthers as they sip nectar from flowers and move plant to plant.

Snowberry clearwings often accompany bumble bees feeding at wild bergamot, dogbane, honeysuckle, snowberry, viburnums, coralberry, butterfly bushes and other light-colored blossoming plants. Bumble bees rest on blossoms, but the snowberry clearwing only rests its front legs on a blossom to stabilize its flight.

One of its nicknames is bumble bee moth, and some believe it is an imitator species—posing as a bumble bee so predators assume it has a stinger. Snowberry clearwings have no stinger.

CONVERGENT EVOLUTION

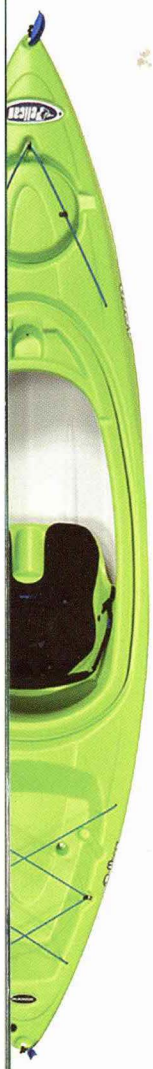
The snowberry clearwing hummingbird moth is an example of convergent evolution: similar body forms and adaptations forming independently among separate species—they hover like hummingbirds, with similar diets and flight mechanisms to feed on the same resource.

LIFE CYCLE

Females attract males with a pheromone released from a gland at the tip of their abdomens. Eggs are laid under terminal leaves of host plants viburnum and snowberry, plum and cherry and other plants in woodland and forest edges.

Larva have lime green bodies with a black dot encircled in white on each body segment. A yellow subdorsal stripe extends from just behind a yellow collar or ridge above the head to the orange (or reddish) tail horn. It grows to about 1¾ inches in length.

Caterpillars wrap themselves in weak cocoons spun among leaf litter and spend winter on the ground as dark brown pupa. They emerge in late spring or early summer in Iowa. If weather conditions are right in early spring and fall, two generations may be produced.



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