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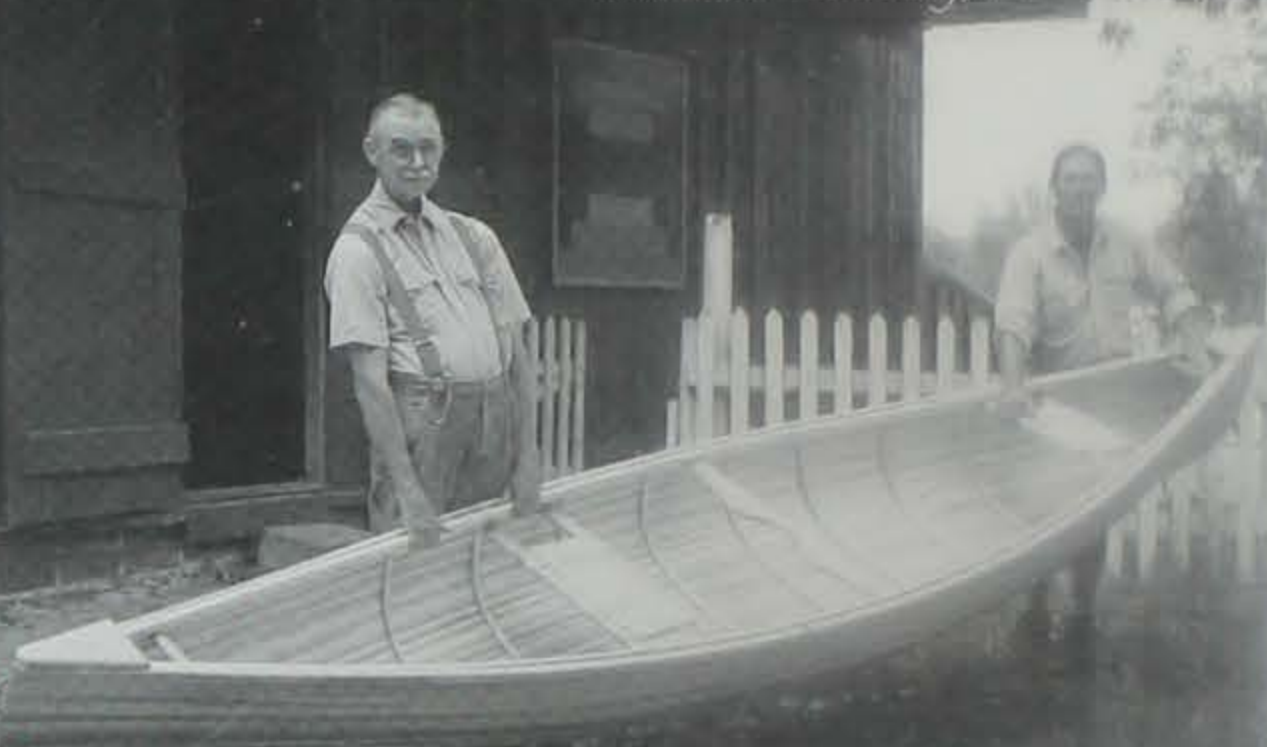
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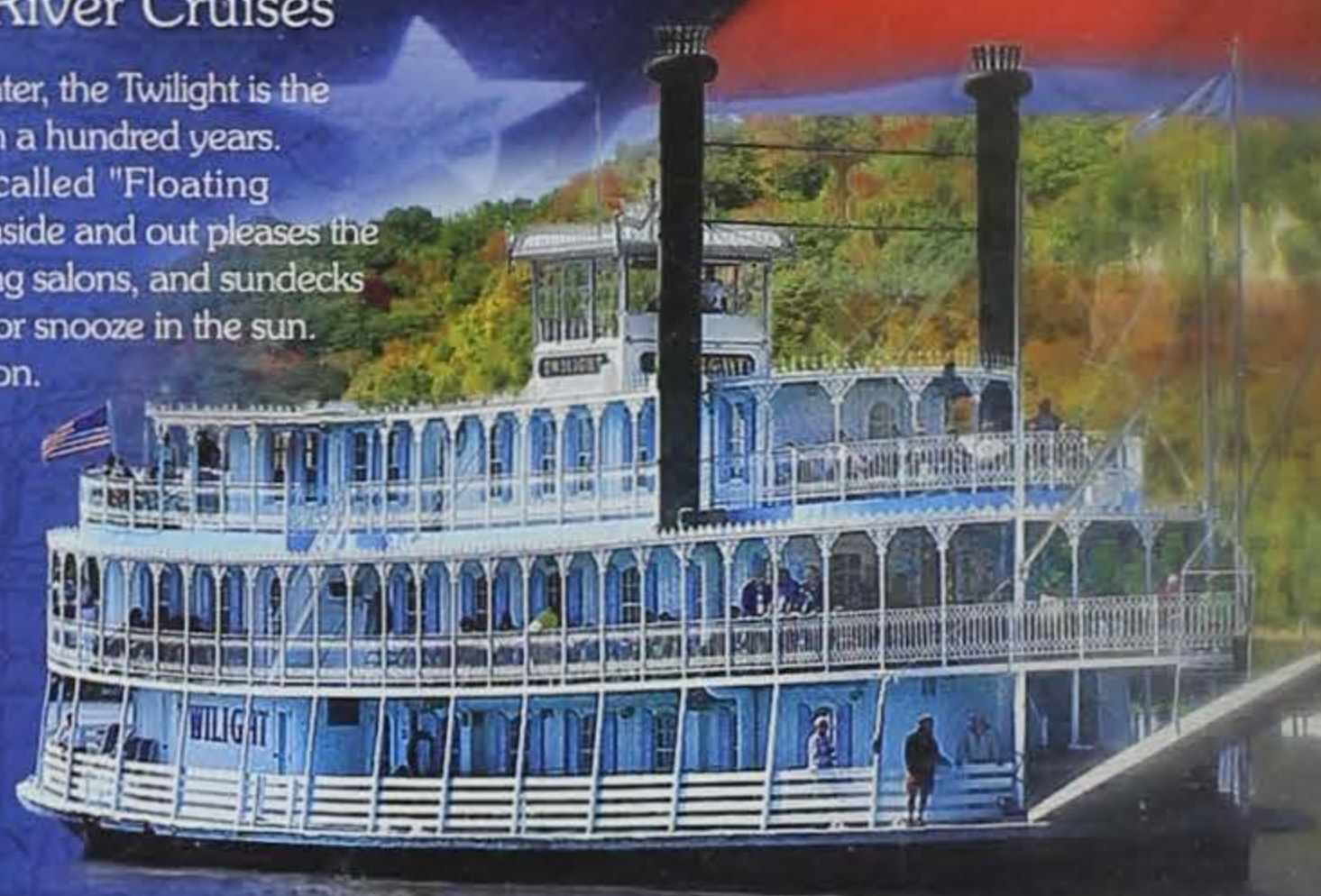
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Iowa Outdoors (ISSN 0021-0471) is published bimonthly by the Department of Natural Resources, 502 E. 9th St., Des Moines, IA 50319. Periodicals postage paid Des Moines, IA. **SUBSCRIPTION RATES: \$15 FOR ONE YEAR, \$24 FOR TWO YEARS AND \$30 FOR THREE YEARS. 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.

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

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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.

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Contributors

ERIC OSMUNDSON

of West Des Moines can frequently be found exploring Iowa's natural areas and photographing its native reptile and amphibian species. All his adventures are documented online at www.roomist.com.



CHARLES MONSON'S

love of the outdoors led him to a career in geology. He's done field work as far away as Texas and Nova Scotia, but some of his favorite geological experiences have been in Iowa, where he has excavated giant sloth bones on the Nishnabotna River and unearthed ancient sea scorpion fossils near Decorah. Monson is a Johnson County native who is currently living in Illinois.



JAMES BARNHART

has spent his life exploring the outdoors. He has a bachelor's degree in fisheries and wildlife biology, a minor in entomology and a master's in business administration from Iowa State University.

He developed a passion for macro photography 12 years ago and one of his favorite pastimes is getting up at first light and walking through any overgrown field or natural area to photograph small creatures he happens to find. When not exploring with his camera, he can be found wading the shores of Iowa lakes and streams indulging in his other passion—fly-fishing. He lives and works in Des Moines.



SANDY FLAHIVE is a


Des Moines writer who likes getting in her Jeep and meandering around Iowa, discovering the hidden gems that lay in its many nooks and crannies. She also enjoys spending time at her remote cabin near Stephens State Forest in southern Iowa.



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STORY AND PHOTO BY BRIAN BUTTON



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ABOUT THIS PHOTO

Photographer Eric Osmundson didn't get many photos snapped before this six-lined racerunner scrambled off to safer ground. One of only five lizards found in Iowa and the fastest of them all, he was caught inside the Big Sand Mound Nature Preserve, jointly owned and protected by Monsanto and MidAmerican Energy. The vibrant underside is what gives it away as a male. It had just finished its noon meal, evidenced from the antennae protruding from its mouth.

ABOUT THE COVER

Conditions were perfect for photographer Eric Osmundson to film this ornate box turtle at Big Sand Mound. Heavy morning rains had subsided and this state-threatened reptile had wandered from the prairie to an evergreen grove on the prowl for food. Part of an earlier meal—likely an invertebrate—remains on its face. Found only in small numbers in remote locations in eastern Iowa, this species-in-peril is illegal to kill or collect. Red eyes identify this one as a male.

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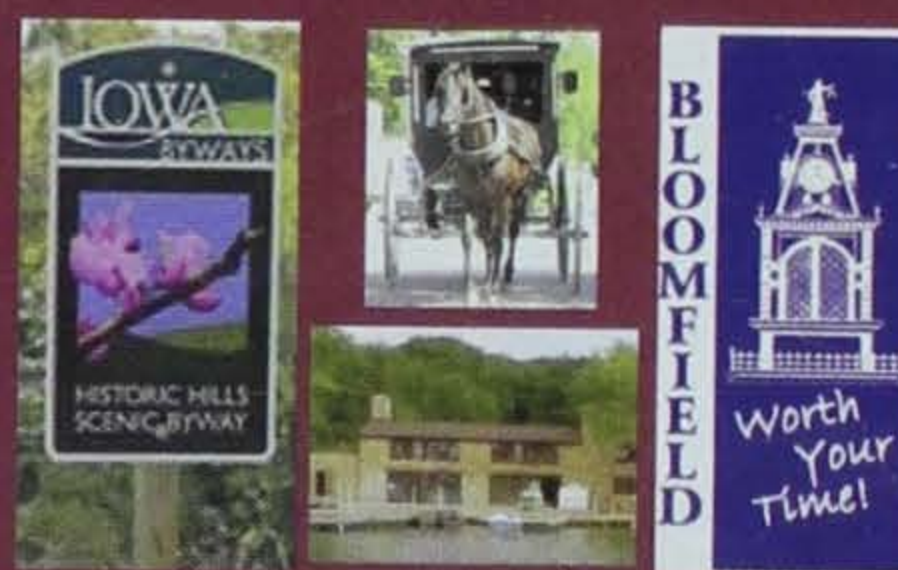
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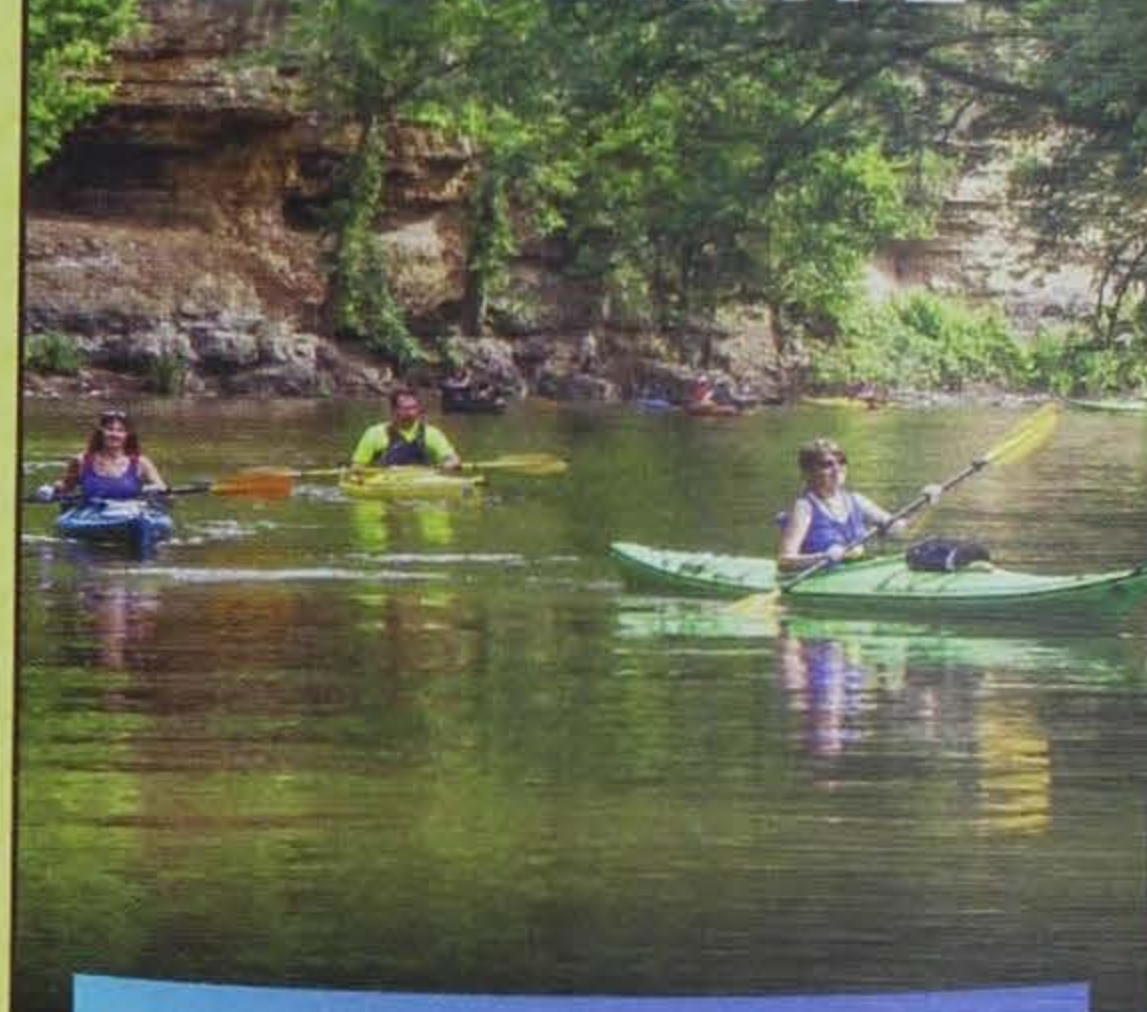
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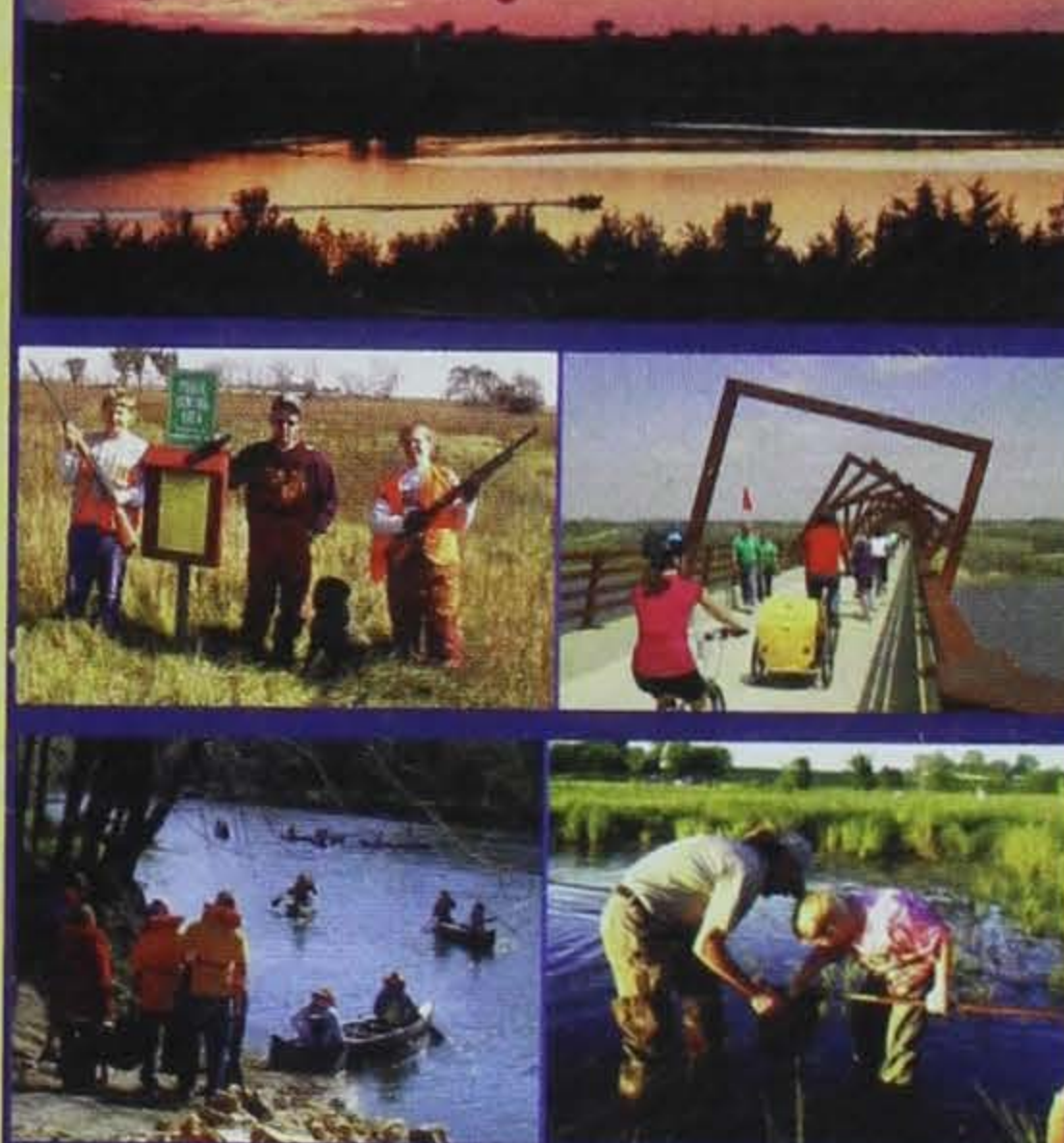
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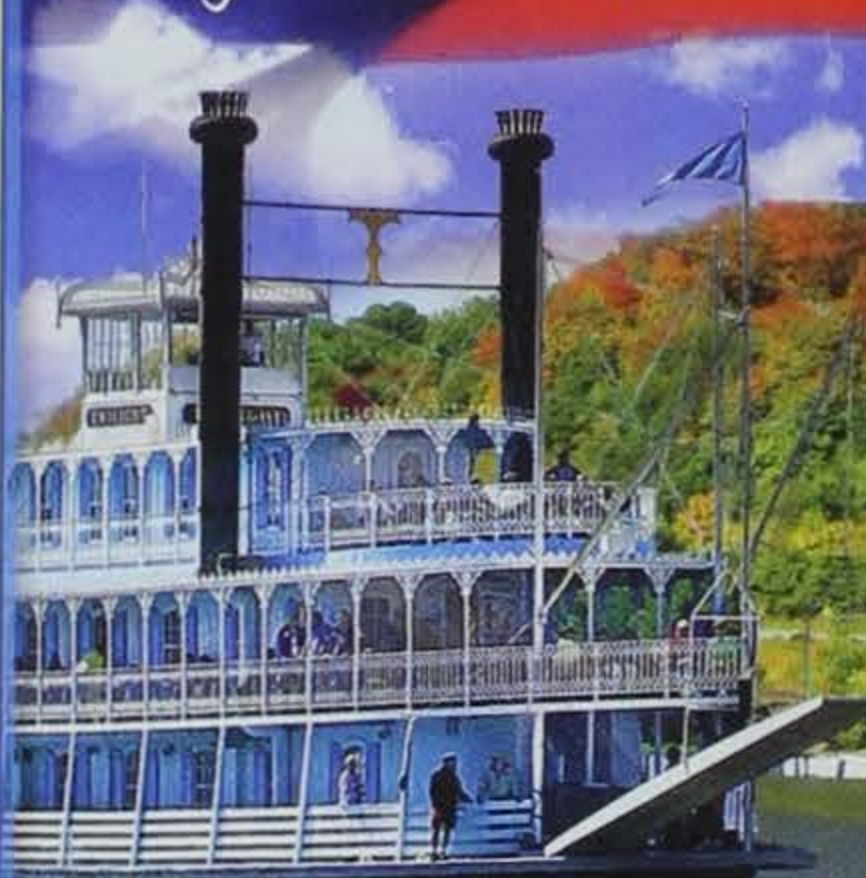
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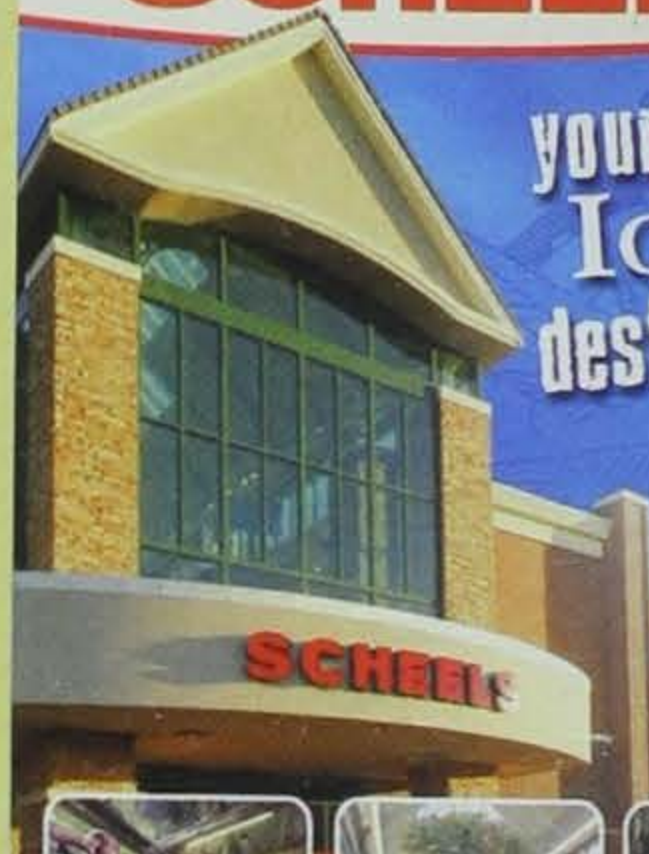
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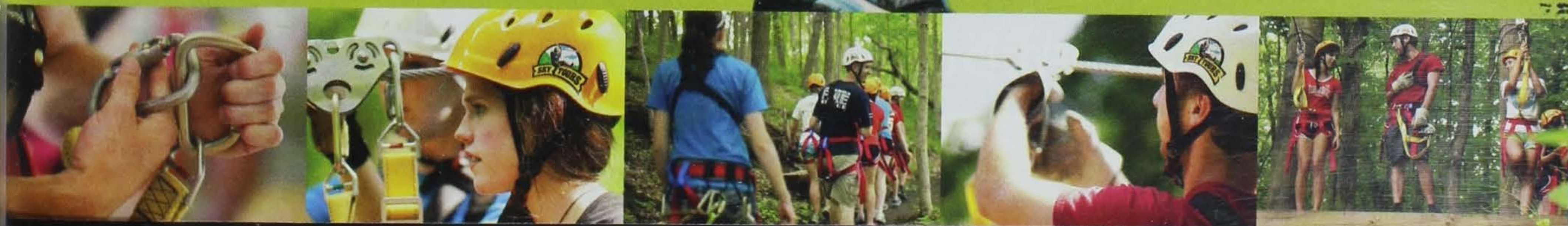
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IS IT TRUE THAT **SUNSETS** ARE MORE SPECTACULAR THAN **SUNRISES?**

There has been heated debate surrounding the myth that sunsets are more colorful and thus more beautiful than sunrises. Regardless of the fact that beauty is subjective, proponents contend that more brilliant colors at sunset are a result of pollutants in the evening atmosphere relative to those in the morning, presumably as a result of a day's worth of industrial activity and transportation.

Stephen Corfidi with the National Oceanic and Atmospheric Administration sheds a little light on this topic and in short states that the rationale behind the pollution argument is flawed. According to Corfidi, "If the pollution argument were true, cities such as New York and Los Angeles would be celebrated for their twilight hues." This is not the case, due to the fact pollutants obstruct the true orange and red colors of sunset from shining through,

making them appear pale yellow and pink.

While this in itself (the relative absence of pollutants) appears to be a plausible argument for those contending that sunrise is more beautiful than sunset, this reasoning is also flawed. In the morning, there can be natural obstructions that diminish colors. These natural obstructions include the mist or fog that may be present during this time of the day.

The fact is, clean air and clear skies are the main component in producing the equally brilliant colors that appear at both sunrise and sunset. Several factors (both natural and man-made) can affect these colors. Therefore, the lesson here is that when given the opportunity, we should enjoy each individual sunrise or sunset based on its own merit.

Ask The Expert

Do robins lay eggs all at once, or one per day? — Maya in Dubuque

Spotting a robin following winter is a much anticipated and welcomed sight, and for many, indicates spring has sprung. Not unlike many of us, female robins appear to be a bit well-rounded following the winter season. The reason females appear more robust is due to the fact that robins do not lay all of their eggs at one time. According to Pat Schlarbaum, DNR wildlife diversity technician, female robins are continually harboring eggs and embryos that are under construction.

Robins lay three to six clutches of eggs throughout spring and summer each containing four or five eggs. The robin will lay one egg a day until a clutch is complete and then begin incubation. While most birds lay their eggs in the early morning hours, the robin lays her midmorning. Why? Because the robin—known as the prototypical early bird—is getting the worm and therefore is otherwise occupied.





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Yard Hollow—named by settlers for the bison bones found there—and then wander past Indian Mounds.

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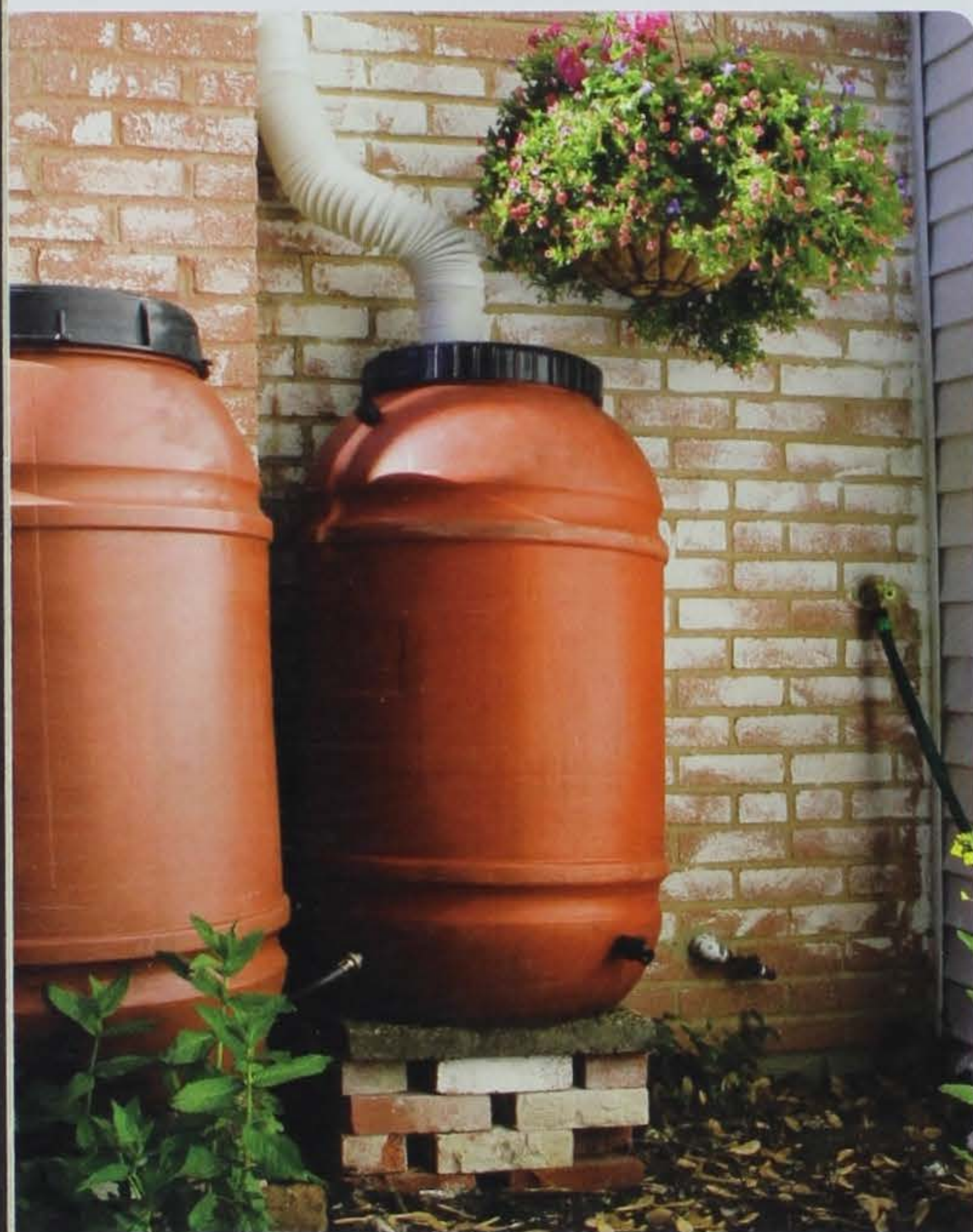
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Drill starter hole for spigot



Trace around atriun grate for hole size



Drill a starter hole, then cut inlet

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Assembly Instructions

INLET

Using atriun grate as a guide, trace around, then drill a starter hole large enough to accept jig saw blade. Cut hole and insert grate.

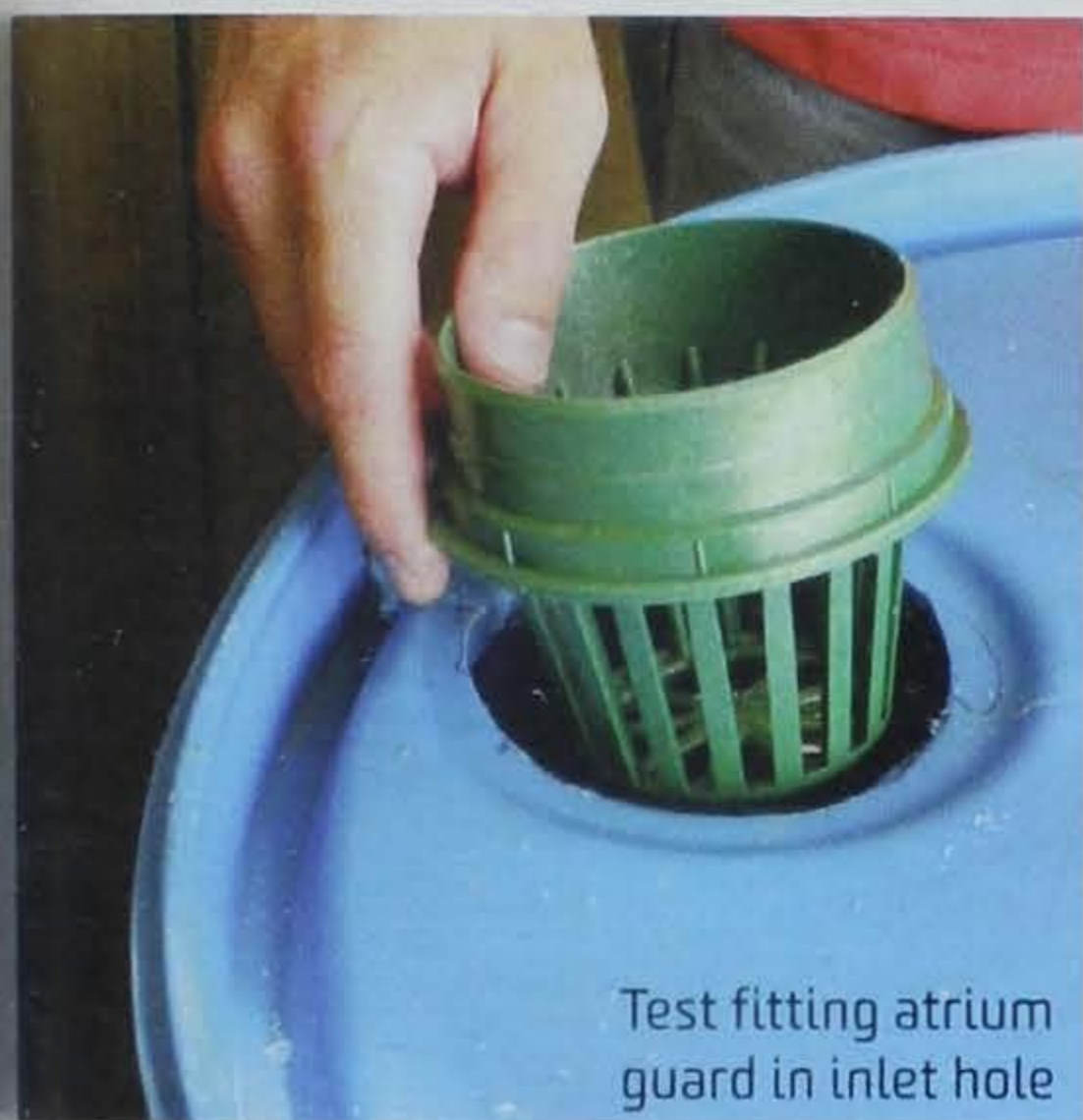
OUTLET

Place spigot as close to bottom of barrel as possible. Drill hole near bottom with a 1-inch drill bit or trace around spigot and cut hole with jig saw. Twist in a 3/4-inch spigot and

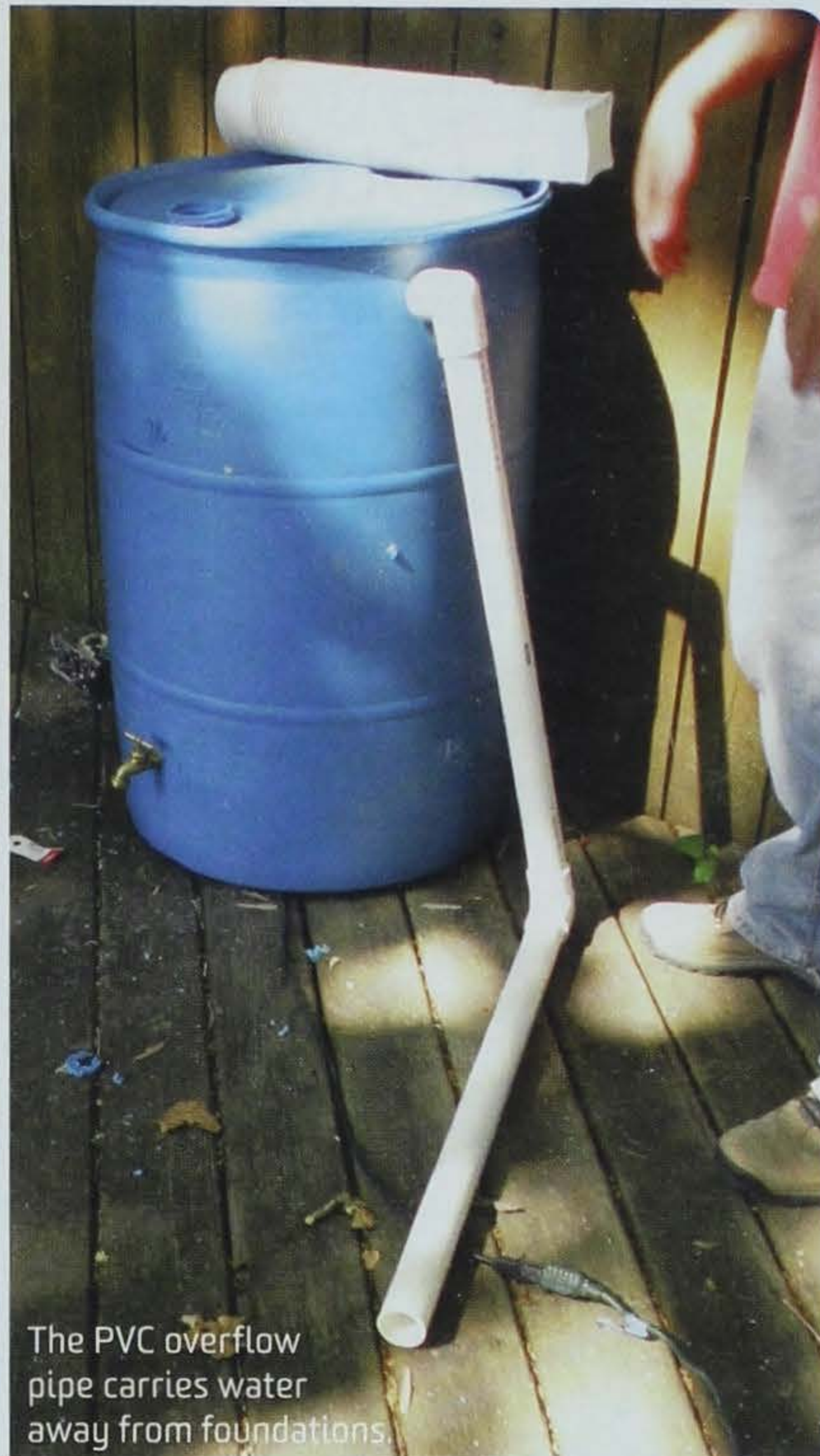
remove. Wrap spigot threads with Teflon tape and screw into hole. Apply silicone caulk around spigot base.

OVERFLOW

An overflow allows excess water to escape and directs it away from foundations. Cut a 1.5-inch side hole near the barrel top—the higher the placement, the greater the storage capacity. First, trace an outline using the inside edge of the non-threaded end of the pipe adapter. Drill a starter hole with a 1.5-inch bit and cut hole



Test fitting atrium guard in inlet hole



The PVC overflow pipe carries water away from foundations.



Use silicone to caulk spigot



Install the overflow elbow



Line atrium grate with optional window mesh

Materials

- Wear safety glasses for cutting and drilling
- 55 gallon plastic barrel or heavy plastic garbage can with lid (food grade barrels recommended)
- Flexible downspout hose
- Square foot of window screen, *optional*
- 4-inch atrium gate
- 3/4-inch spigot (hose bib, silcock or other valve)
- Teflon plumber's tape
- 1.5-inch PVC pipe adapter (male threaded)
- 90 degree elbow (female threaded)
- 4-inch hose clamp
- Jig saw and blade
- Drill and 1-inch and 1.5-inch bit
- Silicone caulk
- Minimum 5 feet of 1.5-inch diameter PVC
- *Optional:* sump pump hose to attach to overflow outlet

with jig saw. Twist in the outflow, remove it, wrap with Teflon tape and re-insert. Seal outer edge with caulk. Thread the 90 degree elbow on the pipe adapter. Measure and cut a length of PVC pipe to desired length. Another option is to create overflow using sump pump hosing to carry away excess water.

BARREL INSTALLATION

Build a sturdy base or stand for the barrel. Determine height for clearance for watering cans or buckets under the

spigot. Use a pre-made stand or build one using pavers, wood, cinder blocks or other materials. The stand must be able to hold 450 pounds. Level the ground and ensure the stand is level so barrel will not fall over when full.

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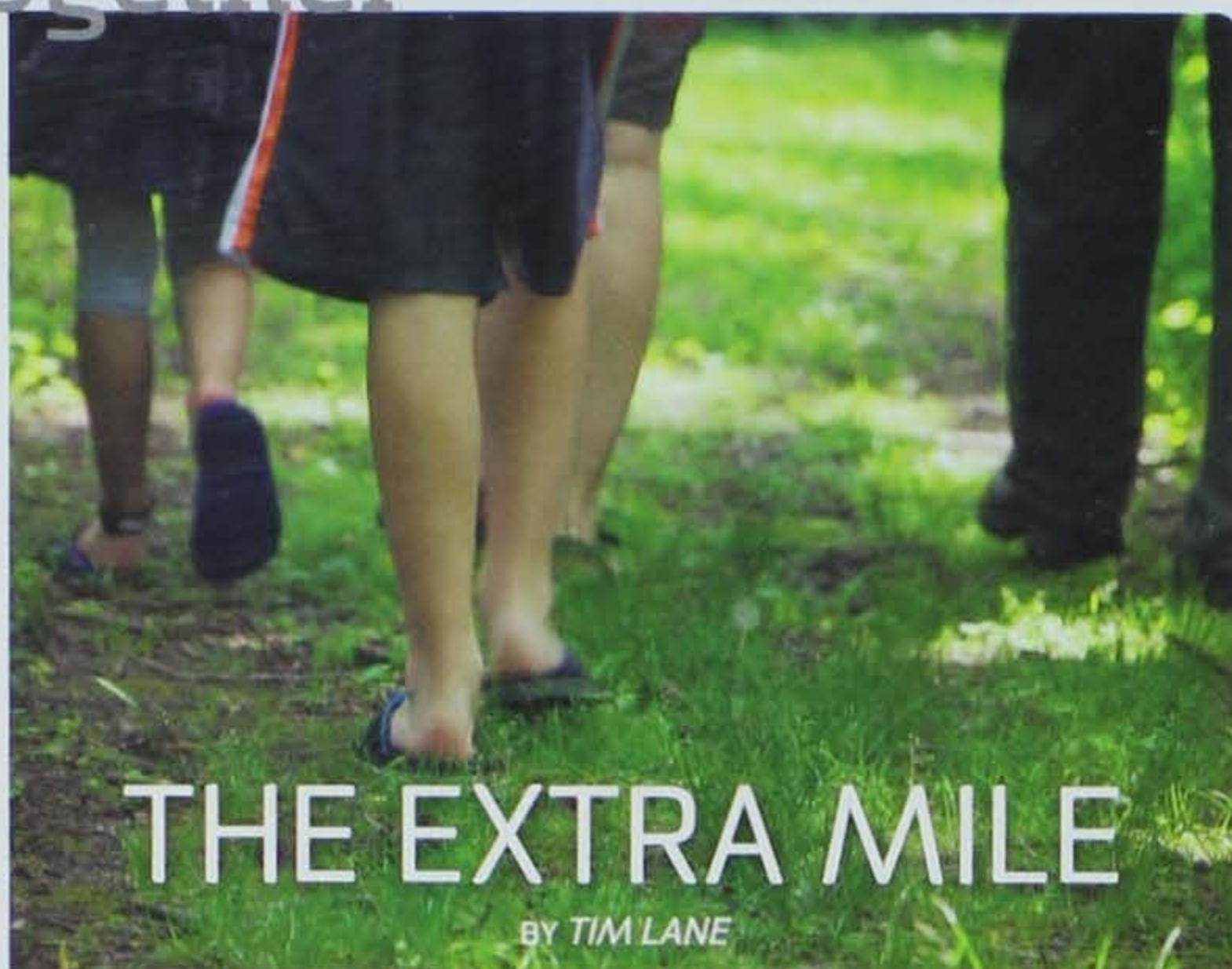
With barrel on stand, mark existing downspout where you wish to cut and remove with tin snips or hacksaw. Connect downspout using flexible downspout hose. An optional 1-foot square of window screen can be

placed inside the atrium grate with excess trimmed or folded over the edge. The screen will have to be cleaned, especially if leaves fall onto your roof. Attach flexible downspout hose to atrium grate with a 4-inch hose clamp.

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Together



The mile is a bit of an iconic distance. The four-minute mile was as glorious a victory for humans as was breaking the sound barrier. And going the extra mile has always been laudable. So it is with a bit of trepidation that today I encourage you to not take that extra mile.

I do so because those pesky researchers have been at it again. Professor Sheldon H. Jacobson is both a computer scientist and mathematician at the University of Illinois. Late last year he published a paper that calculated the impact on American obesity if everyone would just replace one mile of driving with one mile of walking. (Or the least efficient form of transportation for that distance with one of the most efficient.) Jacobson and his team determined that if Americans eliminated one mile of daily driving, the national average Body Mass Index (BMI) would drop 0.21 points after six years.

From a public health perspective, to stop, reverse and decrease the obesity trend by 0.21 points is huge. And on top of that, not only would it not require a billion dollar program, it would save you money in the process.

But back to those researchers. I want to tell them Iowans are ahead of the curve. We have folks all over the state advocating that kids and parents walk together to school. That there be a statewide bike path as part of the 6,800-mile American Discovery Trail. Iowans are recruiting folks to "Do the river by bike!" in 2013 and by river they are talking Mississippi. There is a move to have folks resolve to ride along the river in three states or visit four parks along the banks. For you big thinkers, you could try for all 18 national parks, monuments and trails along the way! But that's beyond today's focus—one extra mile.

Joining all those other efforts is a new push for an "Open Street" concept. I know there are complete streets, quiet streets and plain old streets. But the Open Street concept is a new way of looking at all that concrete. Imagine on some quiet Sunday in your neighborhood a mile long loop of pavement was set aside for just people, providing you a wide trail to stroll to a nearby park, or a great opportunity to teach the kids how to bike or skate.

Such events have already debuted in northeast Iowa and are slated in other communities as well. Here in Des Moines we often close the streets for world class athletes or triathletes. This new approach will certainly welcome future Olympians and face painters, 5-year-old lemonade vendors and some older folks out for a constitutional.

Remember the saying... "Why do we park on driveways and drive on parkways?" Well now we can say we play on both. I say we call them "Park Ave. and You" events!

TIM LANE is a nationally recognized authority on public health and physical activity. In 2010, he and his buddies rode bicycles across Iowa, river to river, in 21 straight hours. He resides in Des Moines.

But Why?

Helping adults answer children's nature questions

BY A. JAY WINTER

A. Jay Winter educates up to 20,000 Iowa children each year as the DNR's training specialist at the Springbrook Conservation Education Center.

CYNDI, AGE 5, IN DELAWARE COUNTY ASKS:

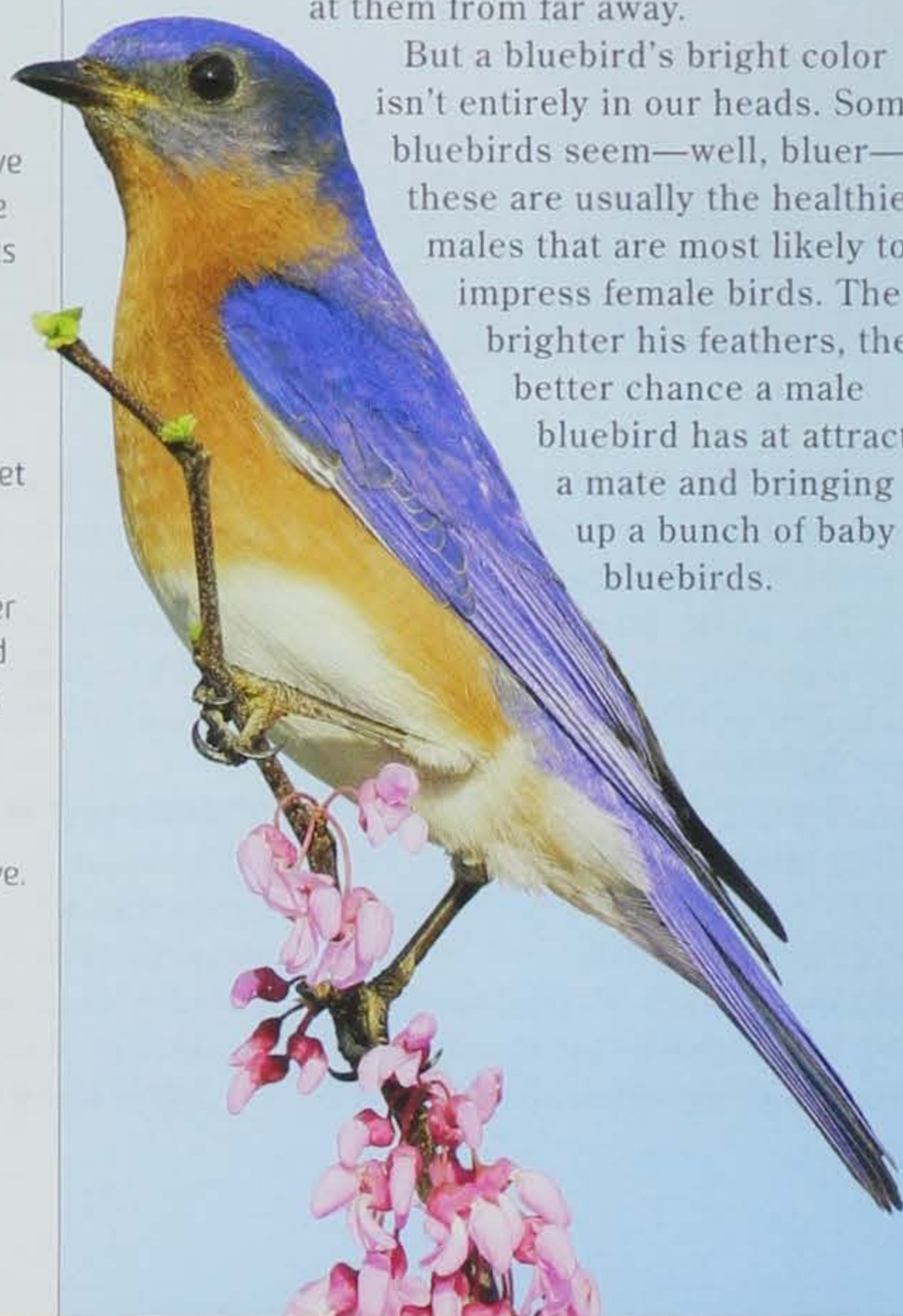
Why are Bluebirds Blue?

Bluebirds look bluer than the sky—pretty impressive for a bird that's not really blue at all.

Some birds turn a certain color because of what they eat. For example, the seafood diet of flamingos turns them pink. So do blueberries turn bluebirds blue? No, because the pigments that make a blueberry blue are broken down when a bird eats them. It never makes it to their feathers.

Really, a bluebird is blue because that's just how our eyes see them. The feathers of blue-colored birds are built differently from other bird feathers. When light hits one of these feathers, it bounces back to our eyes. In this case, the red and yellow wavelengths of light cancel each other out and we see only the blue wavelengths. So what appears blue to us is probably more of a gray color. That's why bluebirds can look duller when you're looking at them from far away.

But a bluebird's bright color isn't entirely in our heads. Some bluebirds seem—well, bluer—and these are usually the healthiest males that are most likely to impress female birds. The brighter his feathers, the better chance a male bluebird has at attracting a mate and bringing up a bunch of baby bluebirds.



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

Give Aid and Avoid Becoming a Second Victim

To rescue a drowning person, remember the **Reach, Throw, Row** and **Go** steps from The American Red Cross.

First try to **reach** victim with whatever is available. Stay onshore and extend a branch, pole or rope to pull victim ashore.

Second, try to **throw** a line, buoy or floating object. Or remove your shirt, kneel down while holding one sleeve and throw out the other sleeve. Remove pants to tie one leg to sleeve to increase reach.

Row, or use a watercraft, when the victim is farther out. In a canoe, kneel and paddle alongside so the victim can grasp the side to tow to shore.

Go as a last resort only if the first three steps can't be used. Keep eyes on victim and remove shoes and excess clothes. Jump, do not dive, into water. Carry a shirt, pants or towel clenched in your teeth. Swim near enough to extend clothing and tow victim. If you have nothing to extend, approach victim from behind and tow to safety by the hair. Don't allow victim to latch onto you and never attempt a rescue beyond your swimming ability.



BY RYAN RASMUSSEN, DROWNING PHOTO BY BRIAN BUTTON



Snake or Lizard?

Do you know a snake from a lizard? The obvious answer—lizards have legs—is wrong. Shown above is southeast Iowa's threatened slender glass lizard (*Ophisaurus attenuatus*) which has no legs. The correct way to tell a snake from a lizard? Lizards have eyelids and external ear openings and snakes do not. Lizards cannot "unlock" their jaws like snakes, so they can only consume food smaller than their head. Lizards can lose their tails to evade predators—a trait snakes lack.

Mosquito Repellent Drives Cats Crazy

Keep mosquitoes away by rubbing exposed skin with wild catnip (*Nepeta cataria*) or use catnip oil. Nepetalactone, the essential oil that gives the plant its odor, is **10 times more effective at repelling mosquitoes than DEET**, according to Iowa State University research.



Lost In Iowa

BY SANDY FLAHIVE PHOTOS BY CLAY SMITH



Go Afloat with the Corps of Discovery



Visit Lewis and Clark State Park to ride a replica keelboat and live 1804-style at the Rendezvous.

"Cast away! Cast away!"

With that resounding command, bellowed stem to stern o'er land and water, the stunning 55-foot reproduction of Meriwether Lewis and William Clark's Missouri-wending keelboat, *Discovery*, gingerly takes leave of the shores at which the explorers' expedition arrived on Aug. 10, 1804.

Today these are the shores of 250-acre Blue Lake, an oxbow created after years of meandering of the Missouri River—and they rim western Iowa's Lewis and Clark State Park, named for the duo commissioned by President Thomas Jefferson to investigate the vast Louisiana Territory purchased from France. Along with several dozen men and supplies they arduously—sometimes against currents of raging water, sometimes "under a jentle brease"—sailed, towed and poled their keelboat up river from St. Louis to hunker in for a spell at the site now part of the Lewis and Clark National Historic Trail.

As was their assignment along the route, the party was to record their every observation about the geography, resources and inhabitants of what now is the western Iowa area around Monona County before continuing their epic 7,689-mile, two-and-a-half-year journey over land and water to Fort Clatsop, Ore., and back.

Word has it they found the spot as interesting and inviting as today's park visitors.

Relatively small at 176 acres, the historical treasure that is Lewis and Clark State Park enjoys mega-sized popularity, according to park ranger Jeff Poen. No stranger to the life, Poen grew up at southwest Iowa's Viking Lake State Park where his father, Gary, served as park ranger. "Our 100 campsites with electrical hookups and 12 with full hookup are right along the lakeshore and are always booked full," he states, "and the two boat ramps provide easy lake access, so there's no hassle to

Lost In Iowa



A highlight of the Lewis and Clark Festival is a ride on a replica of the famed keelboat that brought the Corps of Discovery up the Missouri River from St. Louis on its 8,000-mile journey to the West. Replicas of the pirogue, another vessel used by the expedition, are also on display. Authenticity—from the flag to the onboard cannon—is key to reenactment of the Corps' layover in Iowa.

get to the water.”

With limited waterbodies in the area, Blue Lake is a big fishing and boating draw. Anglers target the class of larger, 16- to 18-inch largemouth bass, or a chance at a lunker northern pike. Catfishing has its fans, too. So, too, is the beach for those interested in a toasty repose in the sun or a refreshing bob in the lake. Shady trails invite landlubbers to navigate through timber for whatever hike desired: a blood-thumping sprint or snail-paced mosey.

The mostly marsh Blue Lake Wildlife Unit alongside the park attracts terns, herons, egrets, yellow-headed blackbirds, warbling vireos and rose-breasted grosbeaks, complementing the resident deer and turkey population.

While the Civilian Conservation Corps lodge is a fine place for group events in the park, the newly constructed visitors center is the main attraction, building-wise. “This is our interpretive center,” explains Poen. “Here we tell the story of the expedition, erect displays and hold

workshops and classes for kids and adults.”

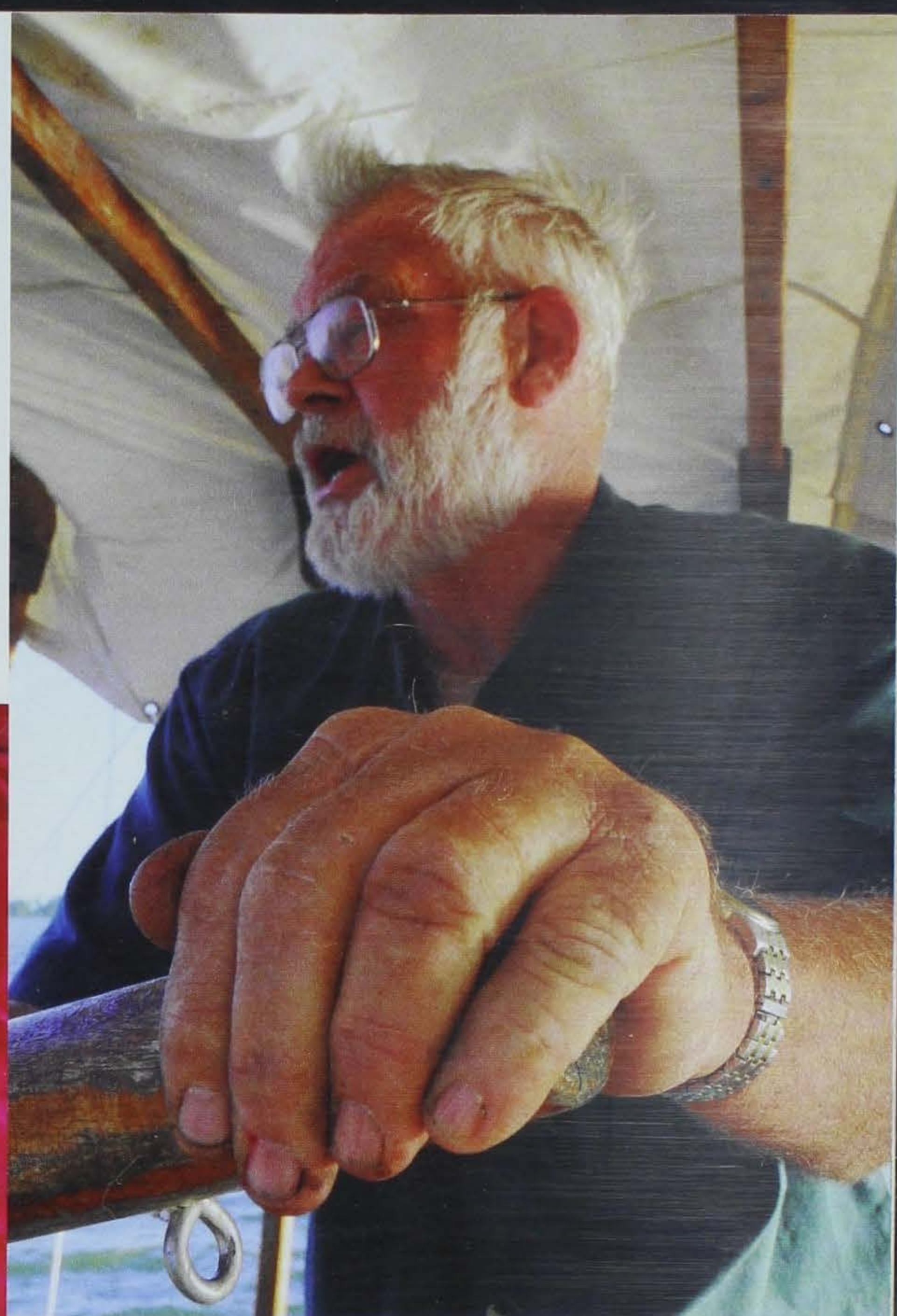
The handsome structure, funded in part by the park’s Friends group, also is home to an impressive boat museum. “The keelboat on the lake, plus this one,” Poen exclaims with pride, pointing to another remarkable replica, “and the smaller boats, the pirogues, were all made by our park historian.”

Come again? Didn’t these magnificent creations have to come from some huge factory where massive machines churned them out?

Ah, no! These are the results of weeks of devoted toil by one Mr. Butch Bouvier, indeed the park’s historian since 1985, and also the painstaking researcher, designer and builder of each boat, assisted by equally devoted local volunteers.

O Captain, My Captain

Known as “Mr. Keelboat,” Bouvier captains his boats, of course, and it is his booming voice directing the crew to



Butch Bouvier, "Mr. Keelboat," is not only captain of the ship, but also the precision builder of the 55-foot replica that lets eager festival guests experience—albeit briefly—the life Lewis and Clark faced on their epic journey. The tour takes place on an oxbow created years ago by the Missouri River.

"cast off" into Blue Lake. Piloting *Best Friends*, named for his wife, this 21st century version keelboat captain is every bit the consummate trailblazer and memorable character that the famous explorers were.

As the craft moves out into the open waters of the lake, Bouvier flits back and forth from the prominent cabin and navigational deck in the stern to the main deck where he carefully scrutinizes the 35 men, women and children perched on wooden seats fastened to the sides of the boat.

"Hey, buddy. Turn around and get your life jacket fastened right," he orders a youngster trying to lean over the side. "And get those arms and fingers inside if you want to keep them."

Even as he checks to assure each passenger's safety, he shepherds every bend, turn and function of the boat. Obviously multi-tasking is his forte. Throughout the hour-long journey he narrates not only the tale of the Lewis and Clark expedition but tells his own life story as well,

explains in detail how he built the boat and interviews members of his awed and captive audience.

"Young lady, where are you from? Are you enjoying the ride? Don't you think living history is awfully important?" Vacillating from being a stern boat captain to soft-hearted teddy bear, to ultra-dramatic actor, Bouvier provides not just an experience for his passengers, he creates an unforgettable adventure.

For Omaha residents Karen McNarry and Sally Stuck, who are spending the weekend in the park, the keelboat ride defies description. Thrilled with a turn at steering the vessel, Stuck mutters a little shakily, "I've never even been on a boat before, any boat. This is really exciting."

Morgan Kierscht, from nearby Moorhead, needs only one word to explain how it feels to steer just as Meriwether did centuries ago. "Awesome!" proclaims the 11-year-old, sporting a huge grin. No less intrigued are Josie Lewis, 10, and her brother, Wyatt, 8. "They're never

Lost In Iowa

AND SO MUCH MORE...

For the Monona County traveler, the list of attractions is impressive. The wise sojourner will invest time in some or all of the following:

- **Turin Man Archeological site.** On a bluff south of Turin, the remains of humans buried at this site about 6,000 years ago were found in 1955 and transferred to the state archaeologist. They are Iowa's oldest remains. Site is on private property.

- **Sylvan Runkel State Preserve.** Like Turin Preserve, this is an outstanding example of Iowa's Loess Hills landscape, with extensive native prairie covering steep hills. Sylvan Runkel was a forester, naturalist and educator in conservation efforts throughout Iowa until his death in 1995. **712-423-2426** 178th Street and Oak Avenue, Onawa.

- **Preparation Canyon State Park.** Mormons rested here in 1853 in their journey to Utah, only to be tricked by a local swindler into turning over all their possessions. The remote 344-acre park has hiking trails and hike-in campground. **712-456-2924** iowaDNR.gov 206 Polk Street, Pisgah.

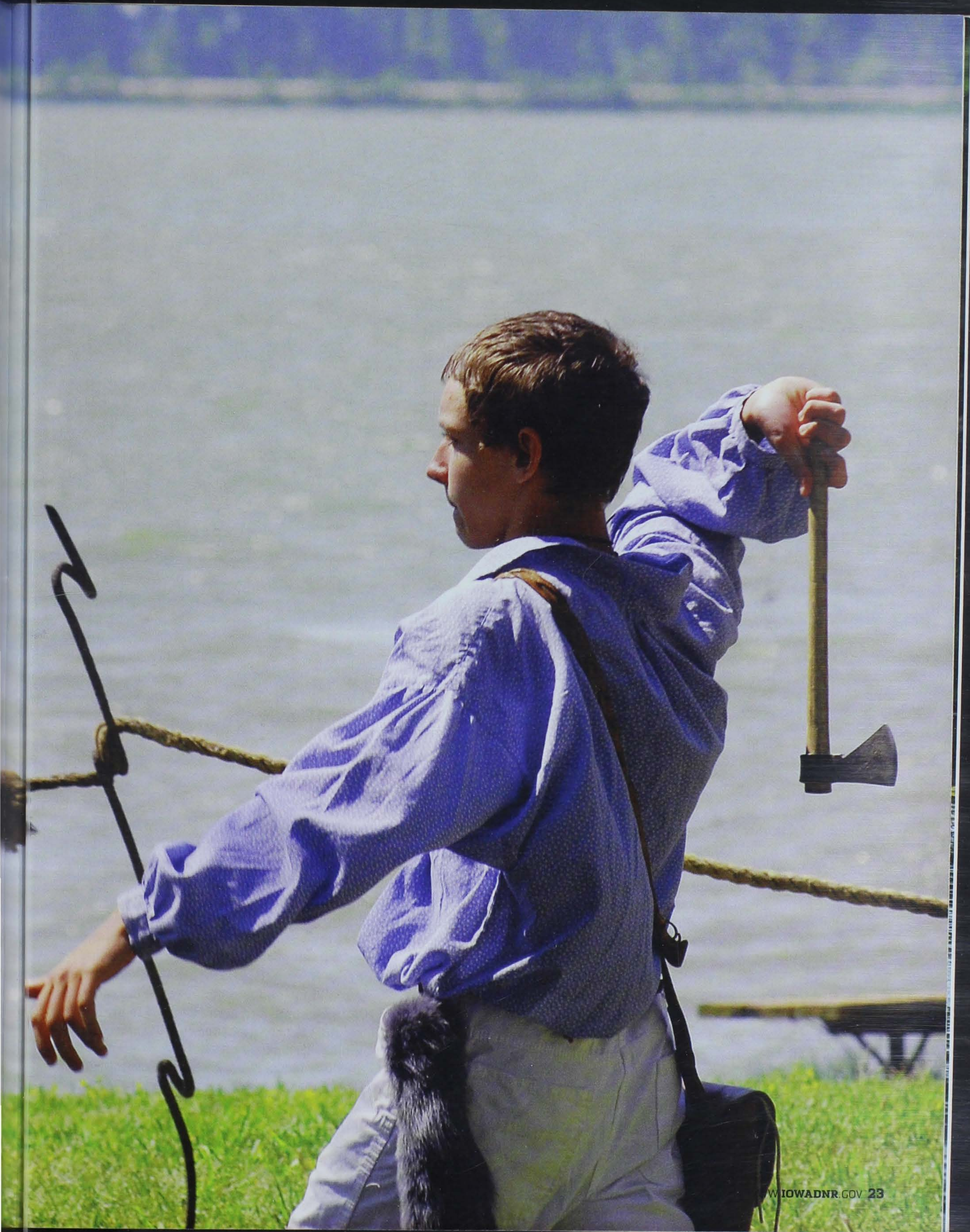
- **Monona County Conservation Center and Arboretum.** Under director Douglas Kuhlmann, MCC manages 17 parks, nature areas, preserves and water recreation areas. The arboretum features a wide variety of trees and shrubs, as well as a butterfly pond/garden. 318 E. Iowa Avenue, Onawa. **712-433-2400**

- **Turin Loess Hills State Preserve.** Explore steep ridges with narrow crests. More than 200 plant species occur here—many typical in the western Great Plains, but nowhere else in Iowa outside of the Loess Hills. **712-423-2426.** Two miles north of Turin and 7.5 miles east of Onawa.

- **Lewis and Clark Festival.** First full weekend in June; 21914 Park Loop, Onawa; **712-423-2829.** Kick off the festival Friday night at the buffalo burger feed in downtown Onawa and music in the park, followed by blackpowder shoots, tomahawk throws and other contests of skill, and of course, a look at period life from the early 1800s. Finish up Sunday with a pancake feed, church services and more blackpowder shoots. For festival details, call Deanna Burgess at **712-433-1505.**



- **R. T. Reese Homestead.** A newly dedicated, 280-acre public area on the Loess Hills Scenic Byway also serves as a Loess Hills interpretive site. Through the Iowa Natural Heritage Foundation, the Reese family arranged to protect the richly diverse natural landscape and world-class landform of their home, which includes restored hill prairie, Missouri River bottom wetland and the historic homestead. The Iowa DNR and MCC manage the various entities. A cabin is available for rent. **712-249-0300.** 22171 Larpenteur Memorial Road, Turin, Iowa.



Lost In Iowa



There's no lack of fur on display at the festivals, a testament to the 1804-era traders and mountain men. The park overflows with buckskinners, musicians on period instruments and vendors selling novelties, drinks and food from the era. Also on schedule are unique contests for the kids.

going to forget this," affirms their mother, Sarah.

When *Best Friends* returns to shore, Bouvier caps off the excursion by treating passengers and the awaiting folks on land to a fitting climax.

"Fire in the hole!" he shouts, a nanosecond before the thunderous roar from the keelboat cannon signals a celebratory end to the journey. Bouvier smiles with satisfaction as the departees clap and roar their approval.

Festival of Festivals

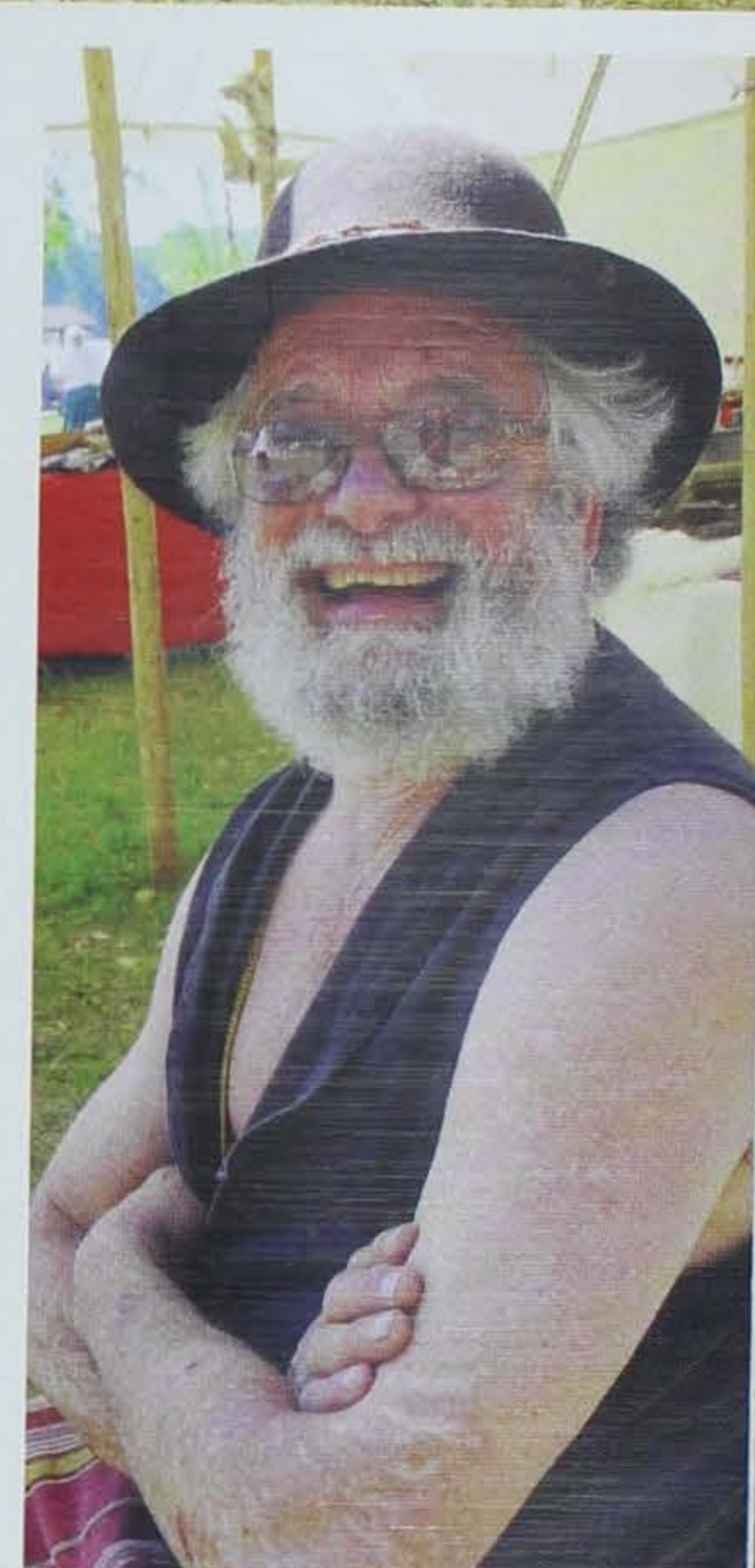
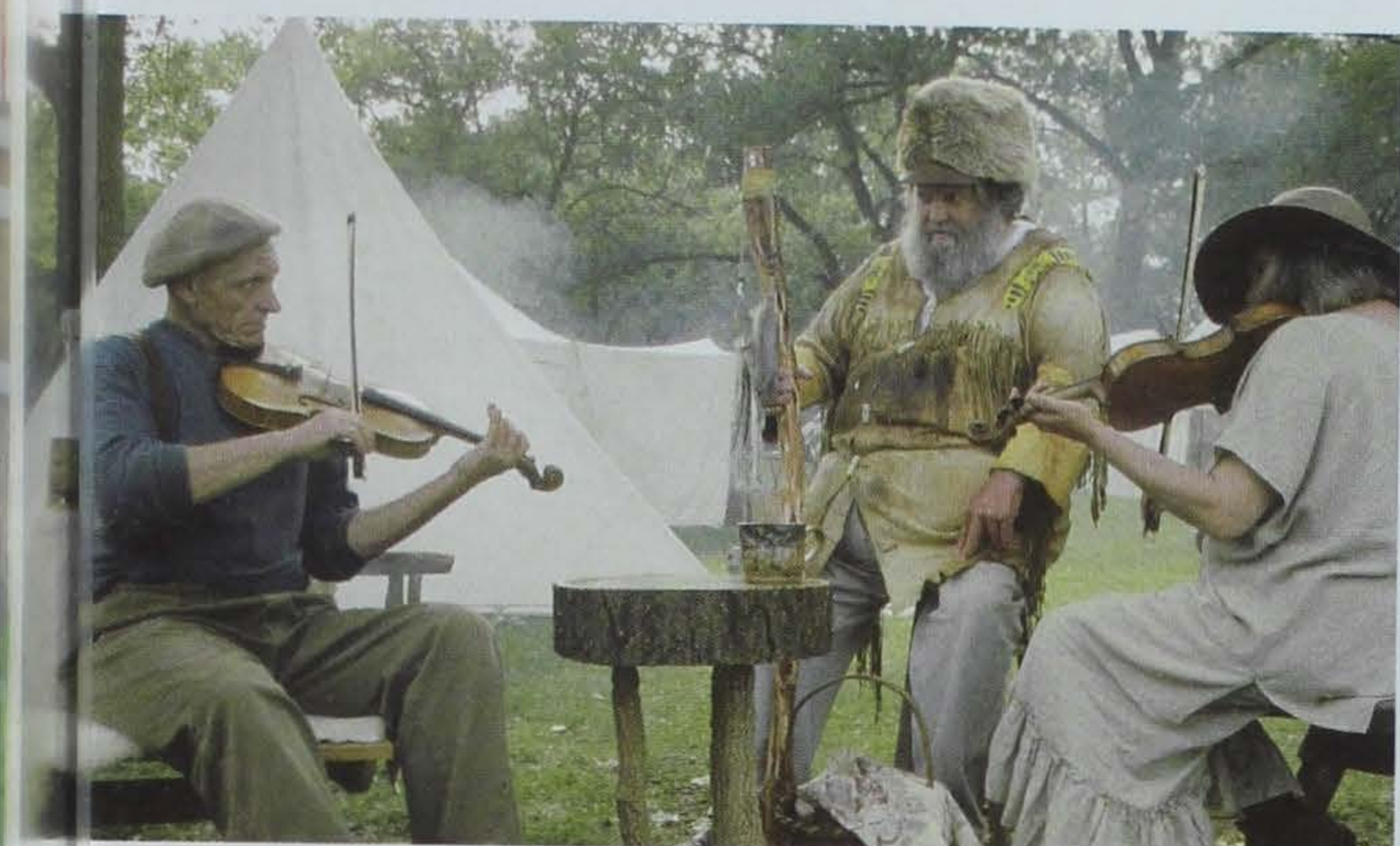
The scene on shore where passengers and crew alight is straight out of the set of the movie *The Mountain Men*, and that tall, rough-hewn man clad in buckskin, the one carrying the hatchet, just has to be Charlton Heston. Doesn't he?

No. This is no movie. It's the annual Lewis and Clark Festival, held in the park the first weekend in June since its inception nearly three decades ago. With support from

the Onawa Chamber of Commerce, the DNR, Monona County and local volunteers, The Lewis and Clark Festival Committee host this event that celebrates the explorers' expedition and relives the 1804 to 1840 lifestyle.

Visitors stroll through the encampment of white canvas tents that engulf the park. What they encounter is a dizzying array of pre-1840 activity. Buckskinners cook hunks of meat over a campfire. Traders offer a variety of goods and engage in verbal combat with bargaining hagglers. Fur merchants and mountain men rendezvous, relax and celebrate by challenging one another in knife throwing and tomahawk matches. An archery contest ensues, the bows all self-made.

Every soul involved in the rendezvous is attired in period regalia. Canvas, buffalo skins and buckskin prevail. Pants and shirts are often gaily fringed at the seams, and rather than buttons, strings secure the garments. Felt hats, moccasins and boots of skins or leather adorn heads



Old friends, new friends and soon-to-be-friends take over the white-tented encampment. Visitors can stroll the grounds, pull up a chair or plop on the ground and chat a spell with the participants. Camaraderie is the name of the game here. Hagglng with one of many traders who offer a variety of pre-1840 wares and goods is part of the experience.

and protect feet. Pocket-less pants require that pouches be strung at the waist to carry necessary items.

Noise and smoke from muzzleloading competitions permeate the park. On wool blankets spread outside tent openings, steady hands deftly manipulate multi-colored beads into ornaments and jewelry. Behind an oak tree a deer hide is being tanned. Over yonder, a scruffy trapper explains how to efficiently snare small game.

Everywhere there is food—pancakes, pies, buffalo burgers. The head spins trying to take it all in.

From every state, some following the entire Lewis and Clark Trail, come these re-enactors...and overseeing the whole shebang is the booshway—an old rendezvous word for “the boss”—John “Lizard” Wilcox. Darting here and there among campsites and trading tents, he has little time for chit-chat, though he does pause to surmise, “The younger generations do not know a thing about this incredible period of mountain men and buckskinners. We

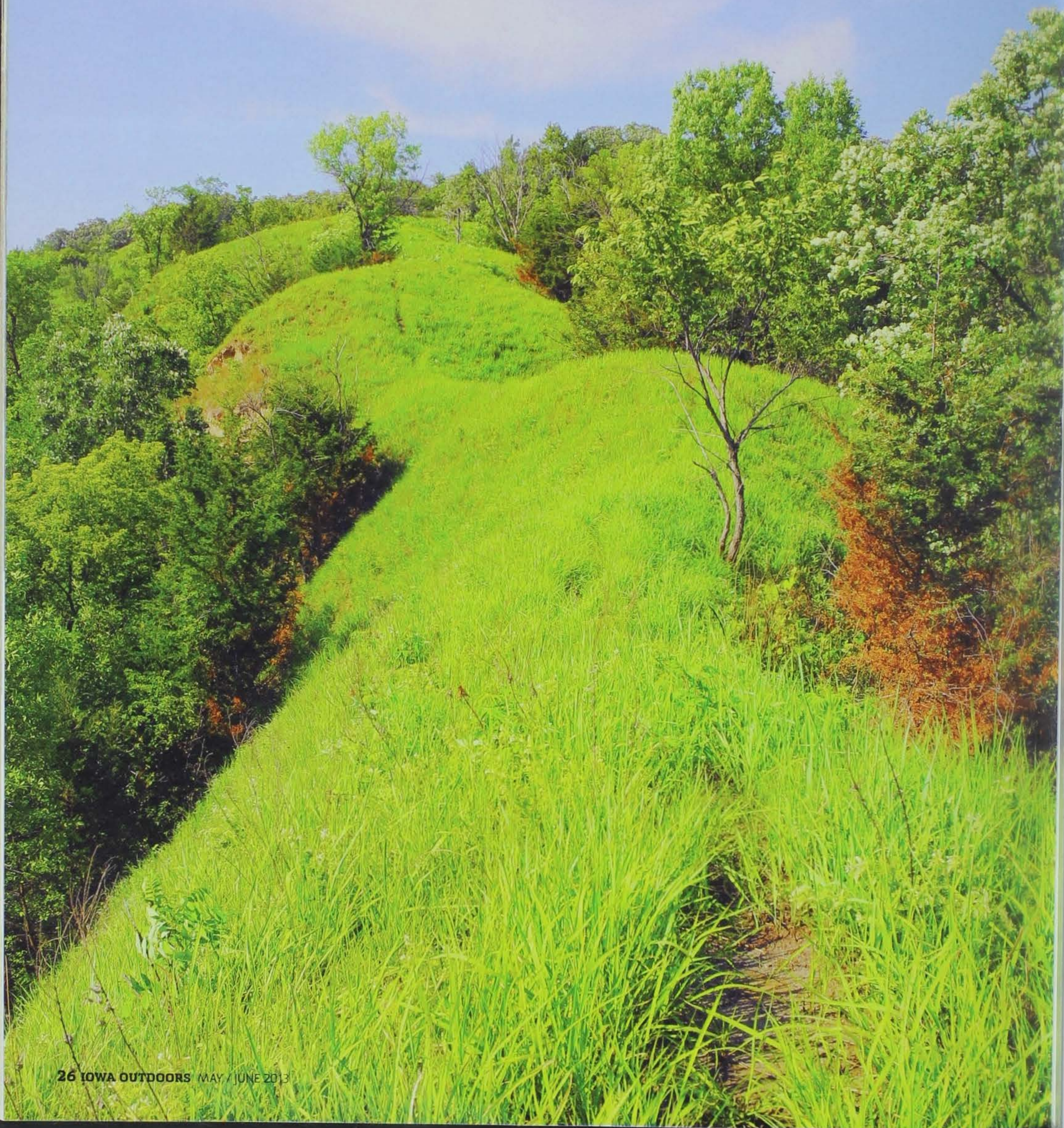
try to push the issue by giving programs in schools and for community groups, demonstrating that time.” Then he dashes off to talk to a fur trader about a beaver pelt.

For Tom Roberts, a former park ranger and currently a Sioux City North High School teacher, the festival is an opportunity to portray John Colter, an explorer he considers one of the most interesting members of the Lewis and Clark Expedition. “I do this out of a love for history, and Colter was historically fascinating,” he says of the rugged individual who is considered to be the first mountain man. “He was the first known person of European descent to enter what is now Yellowstone Park and the first to see the Teton Mountains.”

Roberts’ campsite is a study in authenticity. “Everything here is documented—flintlock, rifles, knives, blankets,” he says, gesturing with pride at his mountain man abode. “Every bit of it.”

A final note about the festival. “We are the only

Lost In Iowa



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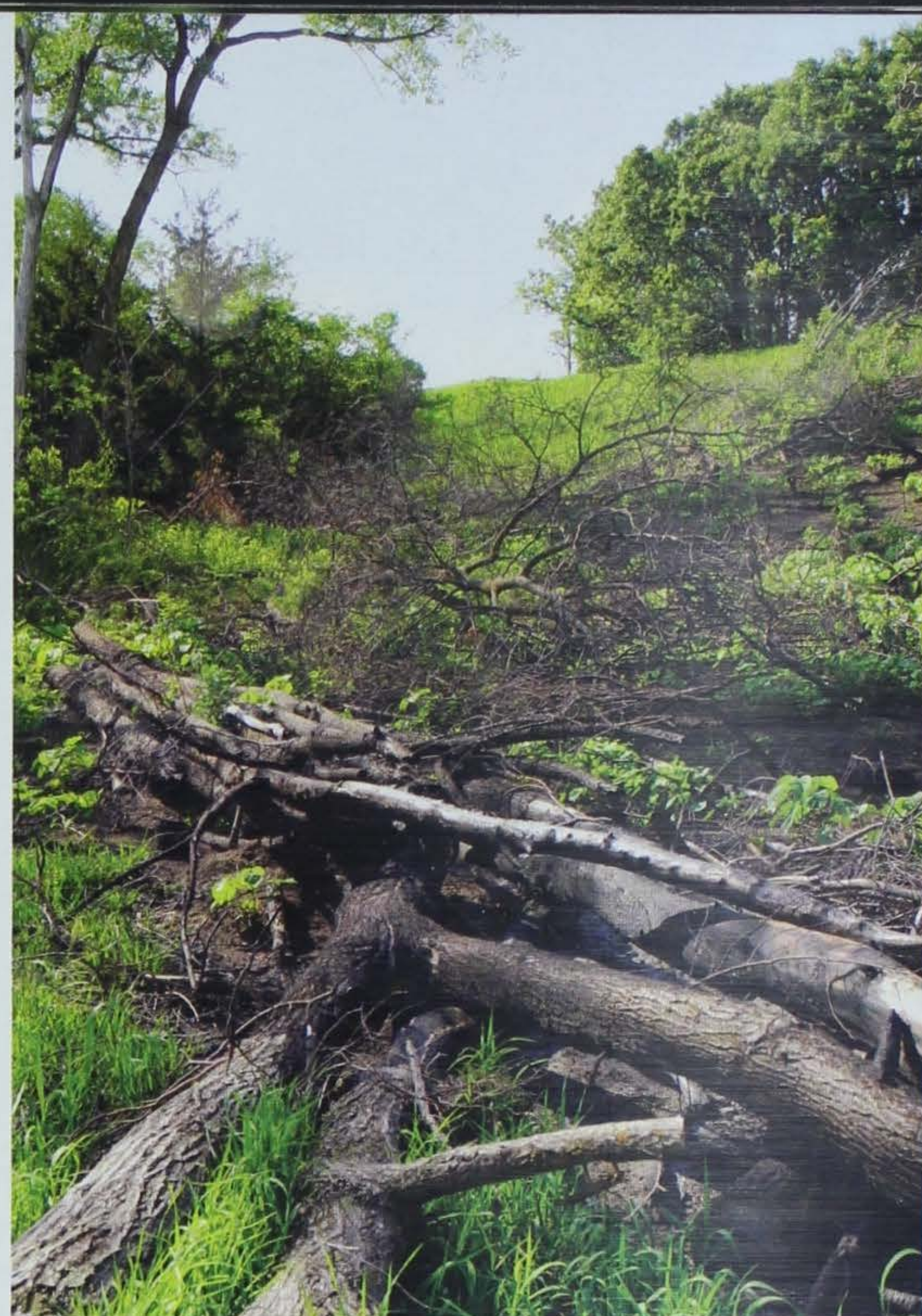
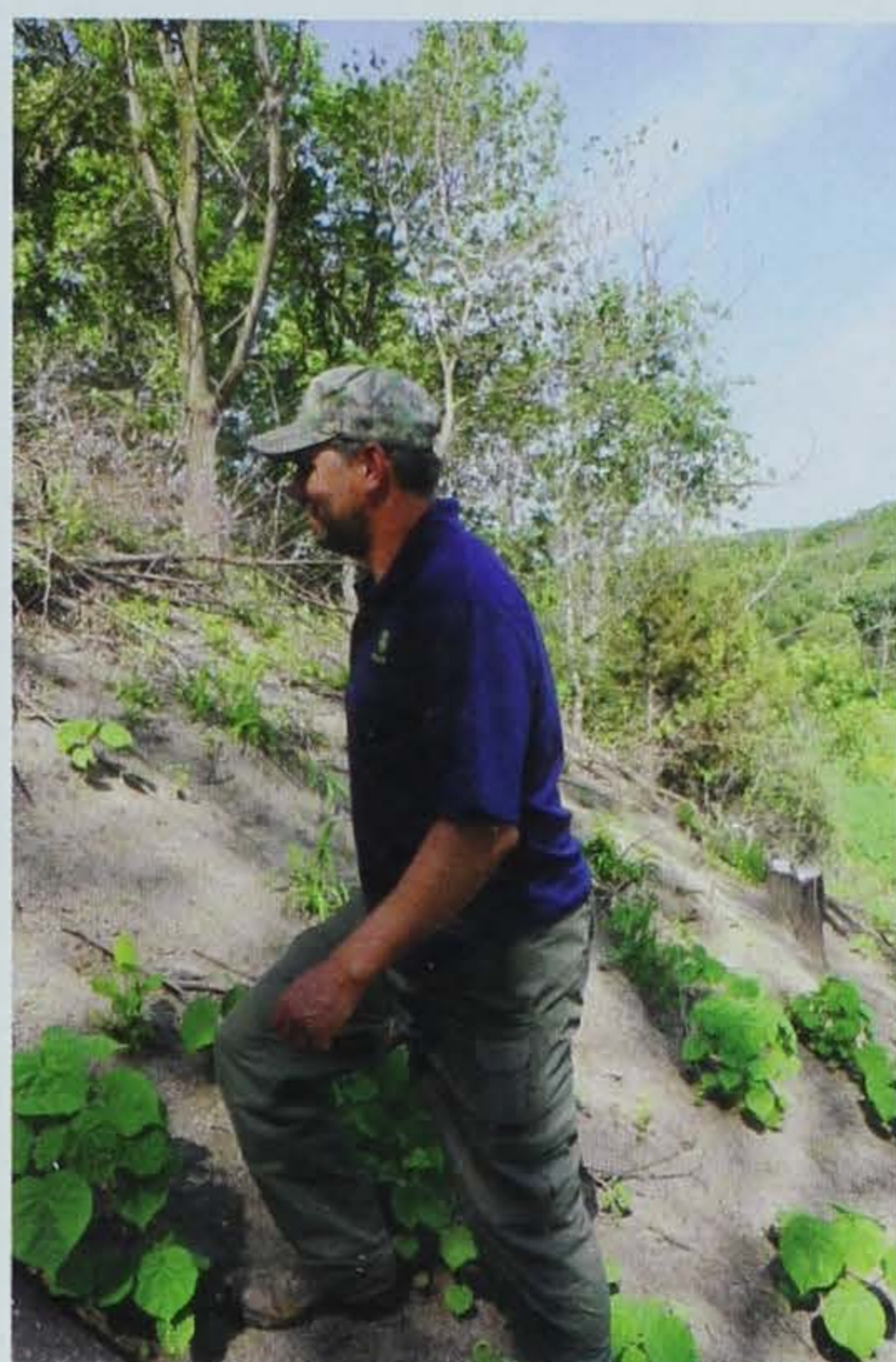
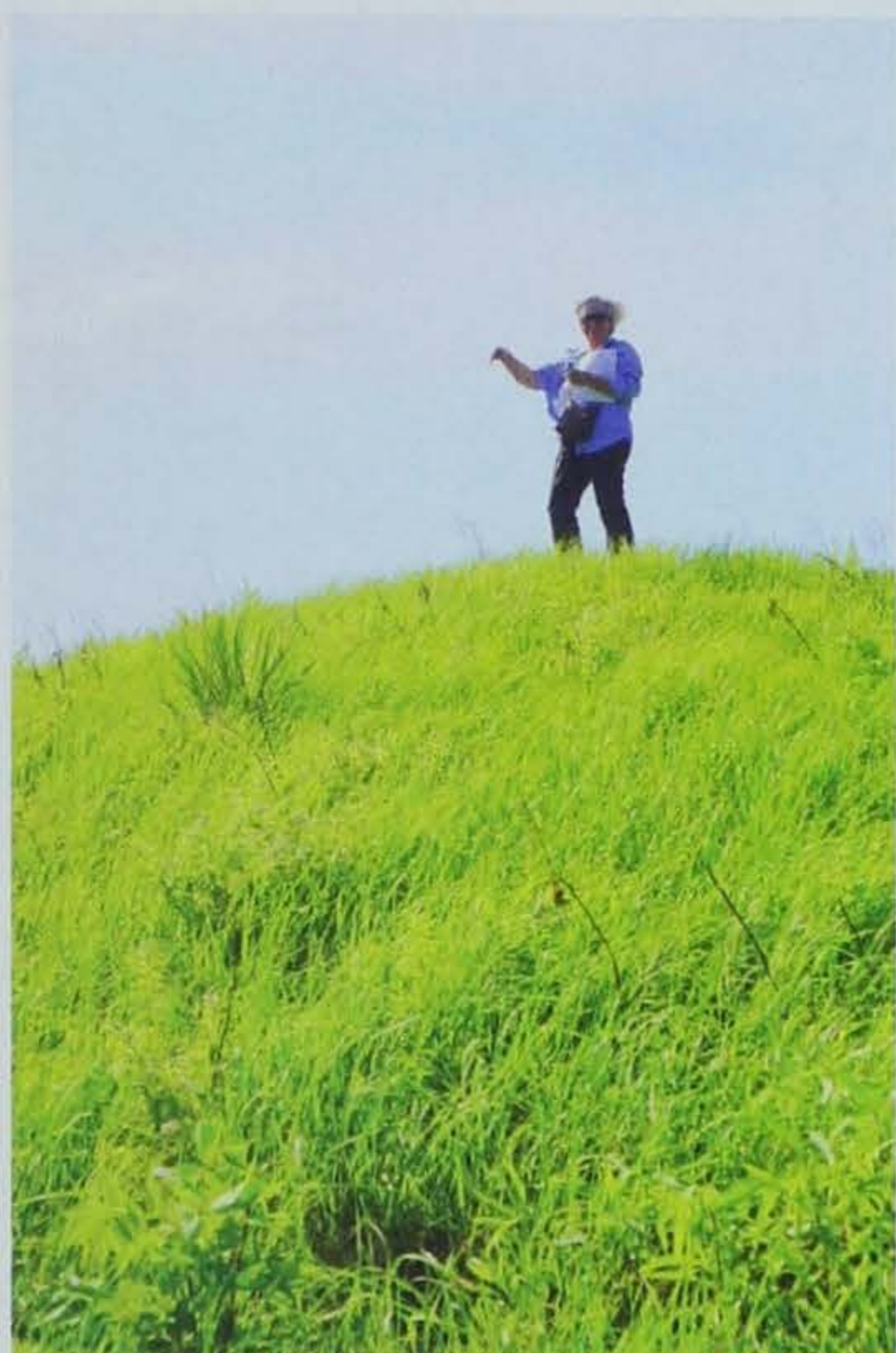
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A visit to the green, rolling Loess Hills is a must for every Iowan. Atop one of the many inches-wide ridges, a hiker revels in the breezy glory of 360-degree, sun-soaked views. Doug Chafa, DNR wildlife biologist and manager of the Loess Hills region, ascends without effort the steep slopes that can be beyond-challenging for novices—but worth the effort. Tree cutting, at right, returns prairie to its natural state.

encampment anywhere with a genuine, bonafide post office,” says postmaster relief worker Margaret Anderson from Blencoe. “We fly our flag out here with pride.”

Iowa's Lush Loess Hills

While the stopover of the Lewis and Clark Expedition is of great historical note and a feather in the cap of Monona County, its importance has to be shared with another significant American treasure in the region: the Loess Hills, through which passes the National Scenic Byway.

This 640,000-acre band of rugged natural prairie-topped and woodland-cloaked hills that stretches for 200 miles along Iowa's western border is up to 15 miles wide in places. The hills consist of a fragile geological wonder formed of up to 200-foot-deep loess (wind-blown) soil deposits, the depths of which are found nowhere else but China.

While humans have lived here off and on for more than 6,000 years, the unique land formation remains a place of uncommon serenity among the eroded gullies and knobs of wind-blown soils. Along the sharp angles and in the deep ravines of these fine-as-flour dunes are many of the rare animals and plants found in Iowa.

Within this spectacular natural resource are some ultra-special places, including Turin Loess Hills Nature Preserve, Sylvan Runkel State Preserve and the all-encompassing Loess Hills Wildlife Area. Doug Chafa, DNR wildlife biologist and manager of the 3,500 acres that make up these areas, is a challenging guide as he

leads a couple of novice Loess Hills hikers up one of Turin Preserves' steep slopes that ascends to a balance-defying, 2-yards-wide ridge top.


“Wind's blowing pretty hard up here,” he says calmly.

“Indeed an understatement!” exclaims a fellow traveler, sinking to all fours for traction.

However, making up for the precarious stance on the narrow perch is the magnificent 360-degree panorama. The Missouri River valley glistens with the green of native prairie vegetation punctuated with the purple hue of violets and the yellow vibrancy of dandelions. Bur oak and eastern red cedar forests grow in gaping ravines. Bluestem and Indian grasses wave gracefully over the 14,000- to 30,000-year-old deposits of silt.

“A number of the plants here are more typically found in western states,” points out Chafa, “and for most of them, the Loess Hills is the only place in Iowa you'll find them.” As if to confirm that statement, a yucca plant pops into view.

Many of the slopes bear evidence of extensive tree cutting. “There's been a lot of collaboration and partnering by individuals and agencies to return these slopes to their original prairie state in order to preserve the system and in turn, the organisms, plant and insect life,” explains Chafa of the treeless, grass-strewn hillsides. “To clear them, we've been employing fire and mechanical cutting. The land has an amazing ability to heal itself and by helping it in this way, it will become biologically diverse once again.” 🐾



In pursuit training, conservation officers and park rangers accelerate to 55 mph then brake hard while steering around a traffic cone—potentially a person, animal or hard object. They are trained to drive evasively around obstacles while keeping their truck in control.

PREPARING for Moments of Greatest Risk

Take an insider's look at DNR conservation officer and ranger training. From pursuit driving, firearms skills and hunting incident investigations, see what it takes to help officers come home safely.

BY MINDY KRALICEK PHOTOS BY CLAY SMITH AND MINDY KRALICEK

"He jumps from his personal watercraft and heads toward Gary Sisco, a plain-clothes conservation officer who was helping me spot violators of boating and watercraft regs. This guy had his fists clenched, his body tense, and his eyes—he was enraged. I wondered, 'Why is this guy going ballistic?' For all the violations Officer Sisco and I had observed him do, he still would only get a misdemeanor ticket," says Conservation Officer Brian Smith.

Reliving the confrontation, Smith describes how training takes over when a situation becomes dynamic, fast moving, and looks like it will erupt into violence.

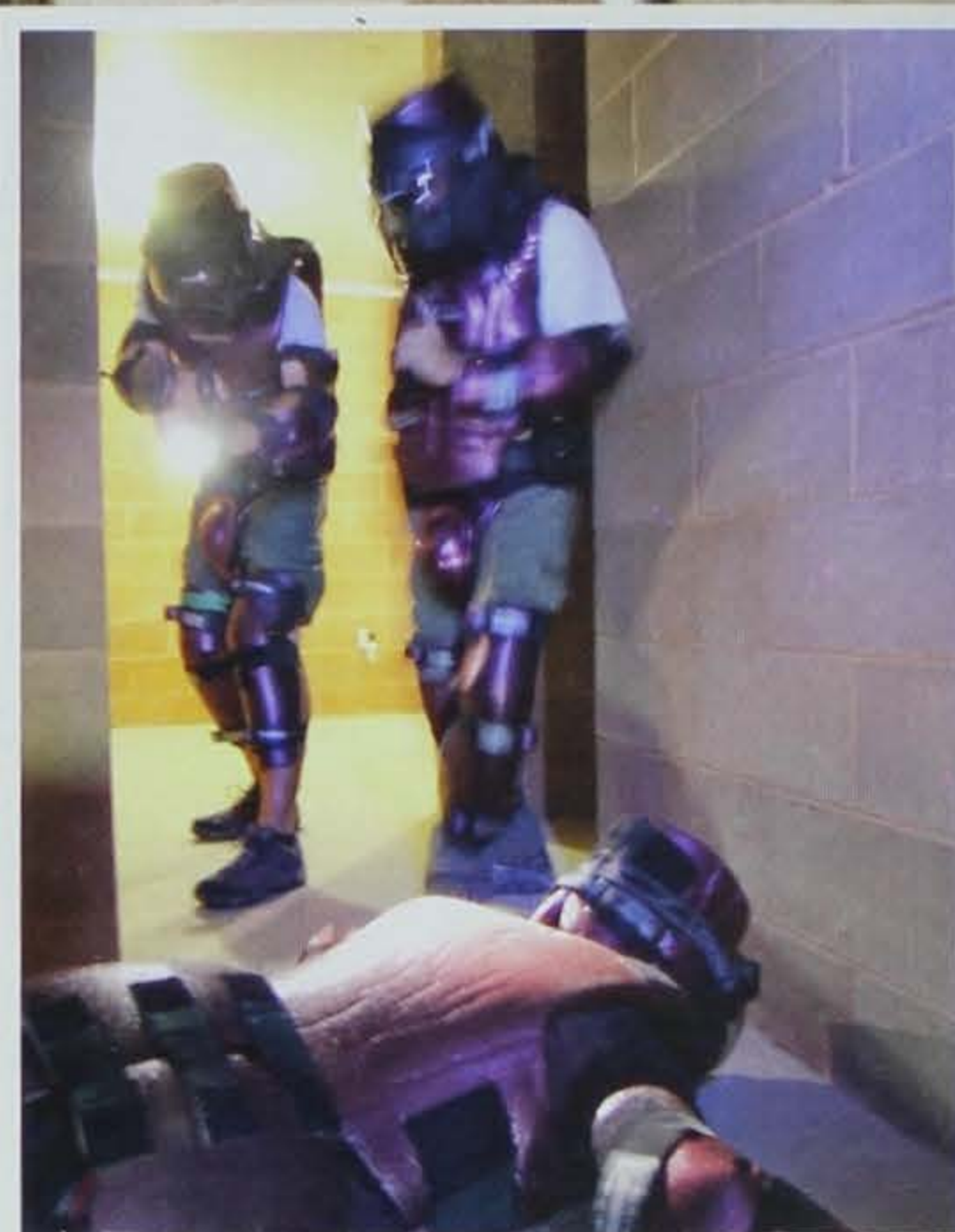
"The guy begins a verbal attack and Sisco asks him to stand back while I finish tying up my PWC. Then it turns physical.

"Not heeding my instructions to get on the ground, I shove my knee against the backside of the suspect's knee. The guy's girlfriend jumps on my back, scratching and screaming. Sisco is able to get him to the ground by sweeping his legs from underneath him. To keep him





DNR officers—while primarily focused on natural resource protection—also assist other law enforcement and sometimes are first responders to any type of emergency or criminal activity.



Conservation officers wear tactical gear to avoid injury during simulated searches at Camp Dodge in Johnston. INSET PHOTO: A “suspect” complies with officer commands.

down I tried using an elbow lock and then a wrist lock. By exerting pressure on a point under his jaw, he was subdued.

“At this point the subject has added a few more violations to his ticket, including assaulting a peace officer. By the time we get the guy to the station, his lawyer had contacted the magistrate and the guy goes home on bail before we get back to work. Eventually the guy pleaded guilty to a lesser charge.”

Dedicated, Ethical and Self-initiated

“Keep in mind, DNR conservation officers are fully certified state peace officers with the authority to enforce all of Iowa’s laws,” says Joli Vollers, conservation officer training supervisor. “They are also federal fish and wildlife deputies who can cross state lines in pursuit of a suspect. They must be fully knowledgeable, skillful and interact well with people, in all kinds of circumstances.”

It’s a profession that finds one routinely approaching hunters with firearms or grappling with extremes, such as a high speed chase on a winding gravel road, checking commercial permits, finding a lost hunter, answering a wide range of questions from the public, assisting an ice rescue or investigating a shooting incident. Only about

90 field officers regularly patrol Iowa’s lands and waters, and they do it in snow and ice, heat and mud, noisy crowds and alone at night.

“A conservation officer is an advocate for conservation of natural resources. They must be an expert in firearms, know Iowa’s laws and regulations and be ready to serve people and wildlife 24-7 on land or in the water,” says Law Enforcement Bureau Chief Bob Garrison. “Most people we interact with love the outdoors and care about the environment, although some may need guidance about state and federal rules and regulations. Our officers provide that information in formal safety education and outdoor skills programs and simply representing the agency as a source of information wherever they go. Then there is the 2 percent of the public who deliberately break the law and they must be confronted.”

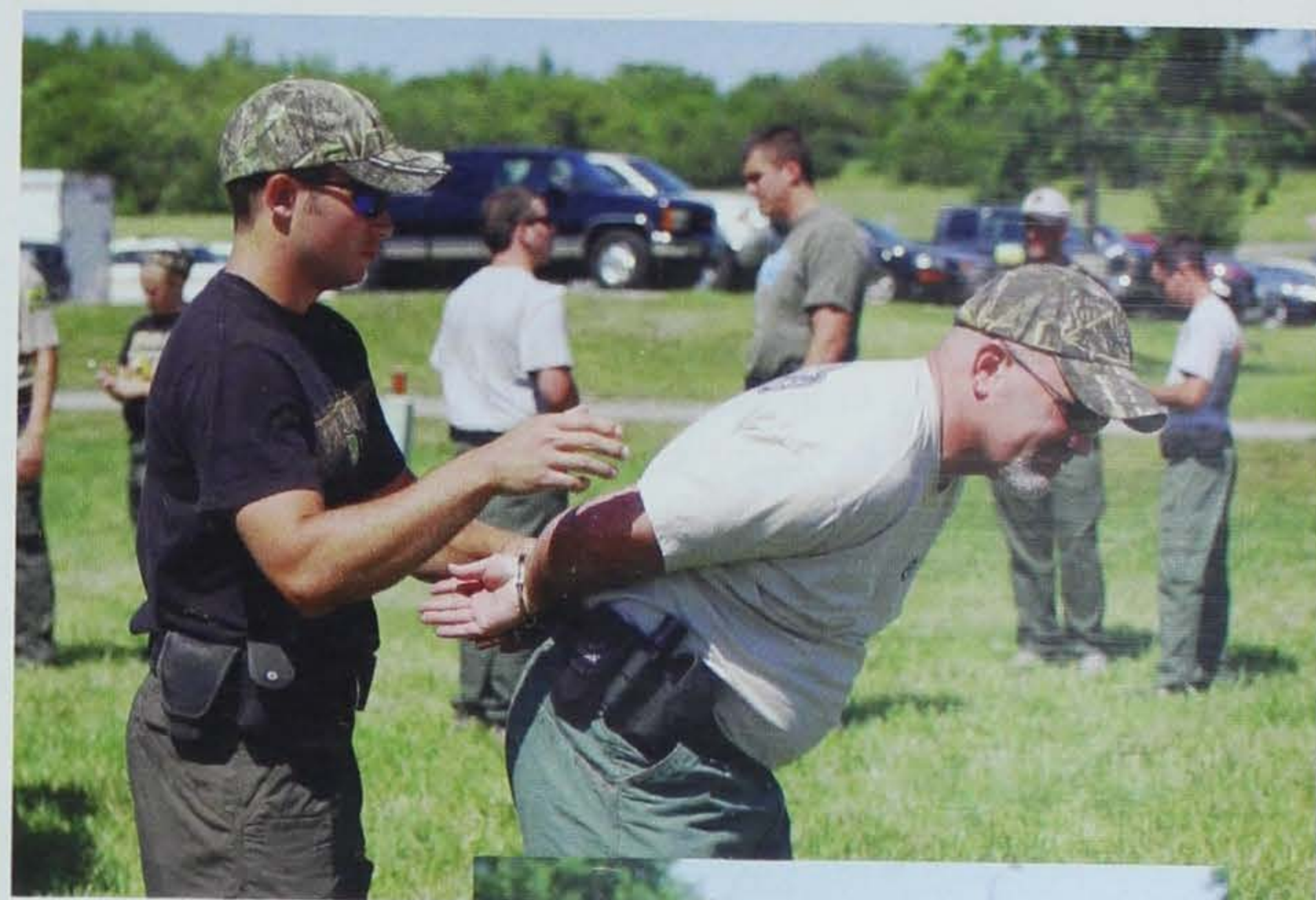
Training—With a Kick

Two officers are crouched in a line behind a third at a residence door. The lead officer makes three sharp knocks.

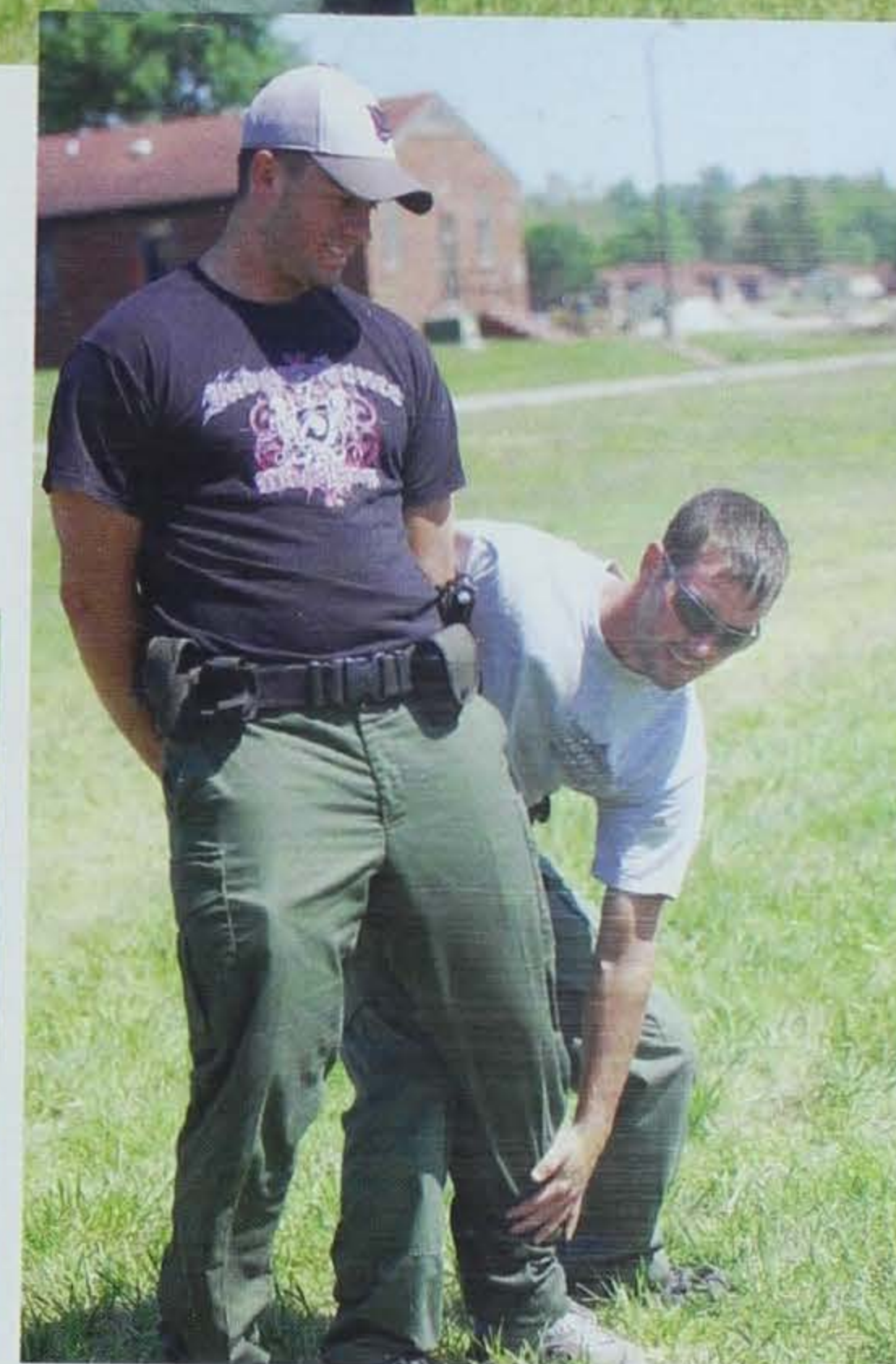
“This is law enforcement. Please open the door!” he shouts sharply. A few seconds of silence follows. “Is anyone home? Open the door! This is Officer Bruner of



An officer defends against simulated assault using a 100-pound sandbag dummy.



Officers practice handcuff and restraint skills on each other while learning that verbal commands can help control suspects. Physical take downs may be required if a suspect resists.



the DNR," he announces.

The second officer ducks quickly to the hinged side of the door as the first officer breaks open the door with a thrust of his foot. Holding a flashlight in one hand over a handgun in the other, he starts low at one side of the dark room and quickly moves the light around the walls to the other side.

"Clear," he says to officers behind him with flashlights off, but handguns ready.

Never Backlight Your Partner

Sign language between officers is simple, direct. There is no room for confusion or error. Officers are in the moment of most risk as a "poaching suspect" realizes his activities are discovered.

The officers move quickly to the hallway and split one to a room, flicking on flashlights to survey each room, keeping lights away from other officers. "Never give away other officers' positions by backlighting them," they were reminded an hour earlier.

This home search exercise allows officers to practice techniques they've been taught during two days of annual training. Their performance is monitored by officer

instructors. For a home search, officers learn room-to-room search techniques, how to gain control of an area, controlling and cuffing suspects and how to protect assisting officers and evidence at the scene.

Retaining Peak-level Skills

"Training varies each year, but the point is to keep officers' skills at peak level, provide them the latest tools, and emphasize prevention and safety," says Vollers.

Current CPR certification is mandated, as well as training in dependent adult abuse, child abuse, blood-borne pathogens, awareness level training for hazardous materials and first responder requirements for homeland security. Firearms certifications must be maintained every year: officers must qualify in marksmanship for rifle, handgun, shotgun, low light and tactical shooting involving moving targets.

"The DNR provides more training than required by state law," adds Vollers. "Annual enforcement and use of force training includes code updates, forensics, and control tactics including baton, passive and active countermeasures, restraints and pepper spray." Additionally, officers are regularly trained in skills they

use most often—professional communications, including report writing and public relations, and operation of all-terrain vehicles, boats and patrol vehicles.

Officers receive training in driving maneuvers, day and night pursuits and driving in gravel. Every three years they recertify skills.

“The point of training conservation officers is so they make it home safely after each shift. Peace officers are as

Officer Driver Training Tips:

- Shuffle steering, with fingers and thumbs on the steering wheel at 8 and 4 o'clock positions with the palms up allows for smoother turns as the hands never leave the steering wheel; and it helps with fatigue. Conservation officers spend many hours driving daily and need to stay sharp, especially at the start or end of their shift.
- Steer through braking, even if the vehicle is going 55 mph when the brake is applied. Use the right foot for both braking and accelerating.
- Weight transfer occurs when a vehicle accelerates, decelerates or changes direction. Weight transfers to the front during braking, causing the front wheels' contact patches to enlarge, adding steering capability. However, the rear tires' contact patches get smaller, so the back is less stable. When accelerating, weight transfers to the rear, providing traction, but making turning more difficult.
- Feathering techniques are used on hard, fast turns. As the vehicle continues the turn, the driver moves the steering wheel in quick, short left and right movements with the fingertips and thumbs in the 8 - 4 positions. If the steering wheel is turned too sharply, the outside tire will lock up and go straight and the vehicle won't make the turn. Over-steering a hard, fast turn makes the back of the vehicle come around, reducing control.

likely to be involved in a vehicle crash as in a shooting, so evasive driving training is a necessary skill to protect the public and the officer,” says Driver Training Instructor Ron Lane.

Training With Skids and Swerves

Under crisscross vapor trails in a September blue sky and behind a field of dry cornstalks crackling in the wind, the gunning of an engine erupts, then squealing wheels, the shifting down of gears, three handgun shots and occasional thuds of a traffic cone as a pickup or SUV takes one out in a serpentine steering maneuver. Park rangers and conservation officers are partnered with DNR driving instructors to learn evasive driving skills on a tarmac at the Oskaloosa Municipal Airport.

“This training serves two purposes,” says driver training supervisor Mark Sedlmayr. “Students practice driving maneuvers at varying speeds. They learn about what their vehicles can and cannot do. They learn their own limitations. And, they get a sight understanding of the distance between a stationary object and their vehicle.”

“The other purpose of training is to drive beyond the pursued driver's ability so that person stops his or her



The finale in law enforcement driving training simulates a pursuit with steering maneuvers that culminates in an armed confrontation—a target shoot with the officer firing from behind the vehicle door.



vehicle rather than continues flight.”

Drivers practice sudden turns at varying speeds, backing up at diverse speeds and angles, and tight turns to avoid obstacles. The driver training finale is a shoot and pursuit of a “rabbit” vehicle driven by a training officer. The rabbit vehicle is a Ford Expedition—a shorter, lighter vehicle than those driven by conservation officers. Drivers chase through a course that includes a hair-pin curve, a box, an s-curve and a figure eight. Although the Expedition turns quickly through the box, the heavier vehicles catch up in the straightaway.

A Step Ahead of Lawbreakers

“Criminals always find new ways to break the law,” says Vollers. “Conservation officers have to stay current with the devices and tools they use. The skills needed to protect people and officers are always evolving. Our officers must be kept up-to-date with new technologies developed to help us in this job.”

Forensic Interview and Interrogation Techniques for Conservation Officers led by Certified Forensic Interviewer and former Conservation Officer Jeff Baile provides officers with fine-tuned interviewing,

interrogation and body language analysis skills. Officers practice mock interrogations.

Then there is Hunting Incident Investigation Training.

Gunfire

Gunshots echo off the banks of the Chariton River. A scuffle ensues with shouting and vehicle doors slamming. One truck fishtails out of the area on a gravel road. A man jumps up from a ditch, scanning the horizon to see what’s going on. Another truck slowly moves into the open field, taking bumps carefully. A person standing in the parking lot punches 911 on a cell phone as he watches two men help a bleeding man out of the back of their truck toward a restroom door.

“I heard gun shots and shouting,” says the man into the cell phone. “There’s a man here bleeding. Send an ambulance. Yes, I’ll stay on the line until an officer is here.”

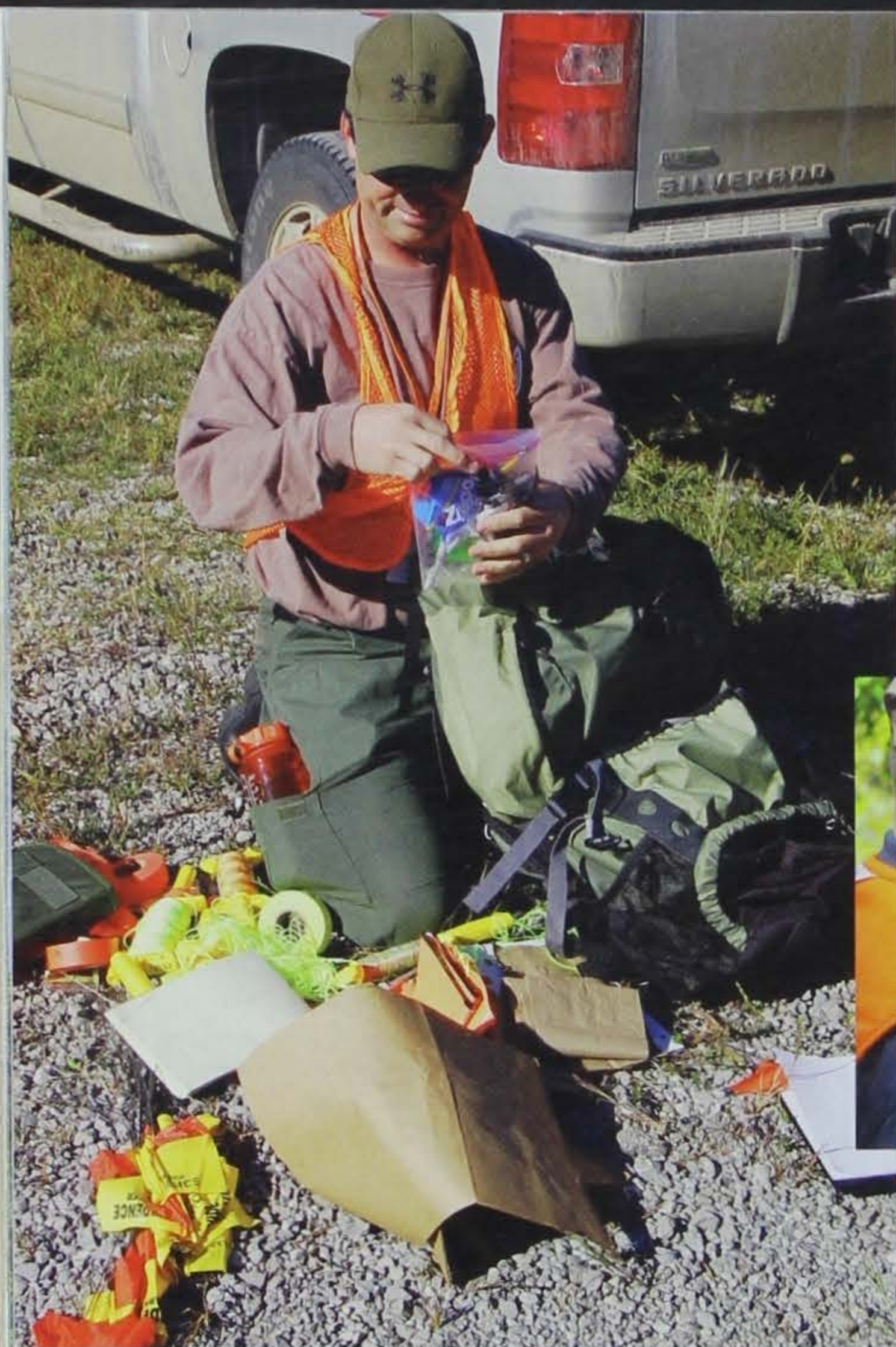
Within minutes a conservation officer arrives. The 911 caller walks toward him.

“I’m the one who called. There’s a bloody man in the restroom. Two men standing by that blue truck brought him here in their truck bed. Another truck drove out like crazy after I heard shots.”



Annual firearms training is a must for DNR conservation officers and park rangers. Training includes qualifications and tactical training with rifle, handgun and shotgun in low-light and dynamic situations.





Officers learn to interpret a hunting incident to determine if the cause of death was accidental, suicide or homicide.



Field training includes investigating mock hunting incidents. **AT LEFT**, an investigation kit contains supplies to collect evidence. **ABOVE**: A DNR staffer acts as an emotional citizen and "interferes" in the investigation and is escorted from the perimeter.



"Wait by your truck please. Do you know if the man in the restroom is alone?"

"I don't know. There might have been someone in there when he went in. I haven't seen anybody come out."

The scene is a staged hunting incident exercise orchestrated by the Hunting Incident Investigation Academy. Forty experienced conservation officers from 18 states are at the Rathbun Fish Hatchery near Centerville for a two-day workshop to learn and practice procedures for investigating and documenting hunting-related shooting incidents.

Accident or Attempted Murder?

"Keep several things in mind," advises Rod Slings, a retired Iowa DNR conservation officer and one of the founding instructors of the Hunting Incident Investigation Academy. "Is this what it should look like? A hunting accident may be an accident, but it might also be suicide or murder. You have to learn all you can about the incident from interviews and evidence at the scene. You must be able to recreate exactly what happened and when you do that, the scene will speak to you."

The workshop covers investigative tools to determine what happened. Scene protection and integrity is

discussed, as well as questions to pose, observations to make and what to record. Evidence is collected, evaluated and interpreted. During the scenario, all the distractions that instructing officers have encountered in their own experience are added to test officers-in-training.

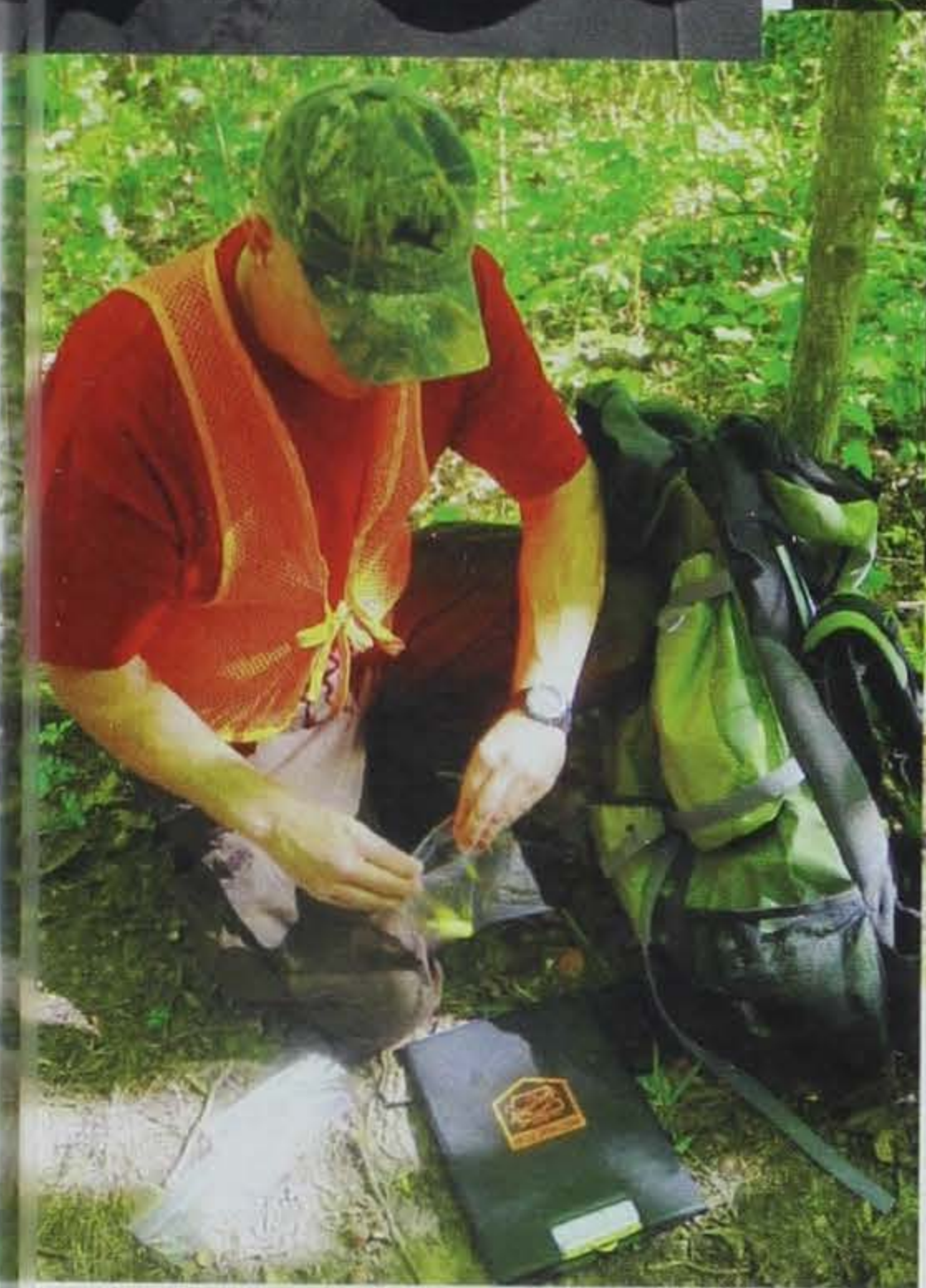
Discussion includes mistakes made and possibilities trainees missed. How could the incident have been prevented? Future public hunting education will include prevention instruction officers learn during this training.

If Not Written, It Didn't Happen

Conservation officers need good report writing skills that never conjecture what happened. They are told to write down facts only. What was learned during the interrogation and at the scene? What isn't written down loses credibility. Officers must prepare complete reports while information is fresh.

Law Enforcement Academy

Additional training for conservation officers includes certification from the Iowa Law Enforcement Academy to serve as training officers. They instruct other officers multiple times annually and attend recertification schools every three years for each discipline. Specialty training



Trainers guide conservation officers in re-creating a shooting incident to determine cause. Investigation tools, witness interviews, scene protection, evidence collection and scene evaluation are part of the lifelike training. All the distractions that trainers have experienced in real situations are added to test officers-in-training.

also occurs, such as undercover investigations.

High Alert

"Most conservation officer applicants are not people who want to be 'cops.'" They usually want a career in natural resources protection and to help people recreate safely. They realize the best way is to serve as a conservation officer," says Vollers.

A conservation officer's job differs from a police officer or state trooper," points out Smith. "We deal with people every day that we know nothing about. We don't know if they've done something wrong. When we approach people and ask to see their fishing or hunting licenses, we try not to be threatening about it. However, we want people to understand why conservation laws exist. We've got to check into suspicious behavior to protect our natural resources.

Both agree training and experience is critical.

"Training is so important for that moment of greatest risk: when an officer has to switch into high alert to concentrate on doing things to stay in control of a situation, so the public and the officer stay safe," emphasizes Smith. "Things can change quickly. On the other hand, what can appear as a threat may not be one.

An officer has to be ready for that, too."

"We can't let personal experiences cloud judgment. We must be self-aware of errors to avoid them in the future," adds Vollers. "That examination of errors, our own or others, helps us keep safe and protect the public through our education programs."

Smith adds, "We work alone most of the time. Sometimes I'll hear someone I approach say, 'What are you so uptight about?' That's because I keep a distance. I can't afford to let a person I don't know anything about get into my personal space. Help may be an hour away, or not available at all."

DNR Director Chuck Gipp summarizes the importance of providing training and resources conservation officers need to perform duties safely.

"Our DNR officers' duty is to protect Iowa's natural resources. There is potential for danger when dealing with armed people who may or may not be happy to see you. Training and skills practice reduce risks. But, it's important we have level-headed, trained people willing to go diligently into situations and do what's necessary to protect our valuable resources. We are fortunate to have a force of officers who enjoy their duty and we all benefit from their protection of Iowa's natural gifts." 🐾

Capture a young one's first fishing trip or ratchet up your own efforts with the new DNR's **FIRST FISH** AND **MASTER ANGLER AWARDS PROGRAM**. Memorialize that first catch or monster walleye with a photo-inlaid certificate, and if you are really good, earn a silver or gold medallion. Visit iowadnr.gov/fish/masterangler.html for details.



First Fish

IOWA DEPARTMENT OF NATURAL RESOURCES

Zach Percival battles a 35.5-inch paddlefish below the hydroelectric dam in Ottumwa. Although shy of the 107-pound, 69.5-inch state record, it did earn him an Iowa Master Angler award. The scaleless, slate-gray fish is most often found in Iowa's border rivers. Percival's brother Matt, and his dad Kevin, also avid anglers, helped document many of Zach's fishing triumphs.

ZACH PERCIVAL

ON THE QUEST FOR 32 SPORT FISH SPECIES

BY KAREN GRIMES PHOTOS BY ZACH PERCIVAL



Zach Percival set out to catch all of the sport fish in Iowa. In one year. And while he is an accomplished angler, most of his success stems from planning and research, which puts him in the right place at the right time. High-tech gear and fancy boats? Ask him, and he'll tell you he uses simple, basic tackle, but is goal-oriented and persistent. Some might say obsessive.

For him, it pays off. Last year he created a list of 32 Iowa game fish, then set out to catch and photograph all of them. His list is a little different from what you might find in the book, *Iowa Fish and Fishing*. The rarely seen tiny orangespotted sunfish is on it. The common carp and freshwater drum are not.

"I took out all the endangered or threatened species and I threw in a few that I thought were interesting," like

the orangespotted sunfish. "It's so colorful, almost neon gill covers and orange spots, it looks like it belongs in an aquarium," he says.

Catching all the fish listed in *The Freshwater Game Fish of North America* has always been a long-held, somewhat vague, dream. "When I was growing up, I thought it would be neat to catch all of them," he says. But it was last year after catching about 15 fish on his list, then 20, and then catching a few he didn't think he'd catch, that's when the dream turned into a passion—one fed by his younger years.

"My grandparents live on a pond up by Mason City," he says. "I've always enjoyed fishing. My dad loves to fish, and has encouraged me and my brothers to love it, too."

While on summer break from the University of Iowa, his dad's encouragement included staking Percival gas

money to pursue fish across Iowa, making the desire to catch 32 different game fish a real possibility.

His strategy started with fishing all the rivers and lakes around Des Moines, his hometown, but the adventure took him to places he's never been. After exhausting the local waters, he turned to the DNR website, looking not just at the fishing report, but studying the species list.

"If you click on it at the bottom, you can find the statewide distribution map for each species, the lakes or rivers where it's found, and the fish survey reports," he explains, adding the Iowa Sportsman forum, an online gathering place for outdoor junkies, has been helpful.

For example, he found from fisheries biologists' reports that West Swan Lake near Estherville was the place to find brown bullhead. So he and his cousin, Luke Johnson, headed to northwest Iowa.

"Google Earth became my friend, too. I'd check it to see if I could fish from shore."

Being mindful of his dad's gas contribution weighed into the strategy, too. "I had to balance going to get these fish without racking up a lot of mileage." So Percival would look at surveys for several species to find the best locations to find the most species per trip.

That research was essential, because most of his experience was fishing for bass, pike and walleye.

Catfish were a new experience. "For catfish, you have to decide whether to fish on the bottom or the top, actively casting or still fishing. When I go to catch catfish, I keep it as simple as I can, using a no-roll sinker and a circle hook with a bunch of worms on it."

Using worms or any live bait is a change from his usual artificial lures. But knowing the feeding habits pays off. Chalk up blue, channel and flathead catfish. Add black, yellow and brown bullheads to the list.

Habitat is just as important as habits. "A key thing is when you go to a river, or any body of water, you want to look for the spot most likely to have fish. I look for eddies or current breaks or some sort of structure that breaks up a normal flow in a river."

Even so, sometimes it just doesn't work. "A lot of times you have to go back again and again." That's what it took for the brown bullhead.

"You have to know what you are after, know that it's there and then you have to be persistent," he says.

Percival prefers fishing lakes, but has fished a mix of rivers to fulfill his quest.

"River fishing has its challenges. You're a lot more prone to get snagged on rocks, obstructions in the water," he says. Yet if he has to name a favorite fishing hole, it would be the streams in northeast Iowa. "I really enjoyed catching trout. That's scenic with the bluffs. I'd never been in that part of the state before."

He found a hair jig (a plain jighead with a feather on it) to be the best lure for trout. Using a 12- to 15-inch



Striper



Smallmouth Bass



Yellow Bass



Channel Catfish



Flathead Catfish



Blue Catfish



Largemouth Bass



Rock Bass



White Bass



Spotted Bass



Percival with white crappie
at Saylorville Lake



Bluegill



Black Bullhead



Pumpkinseed



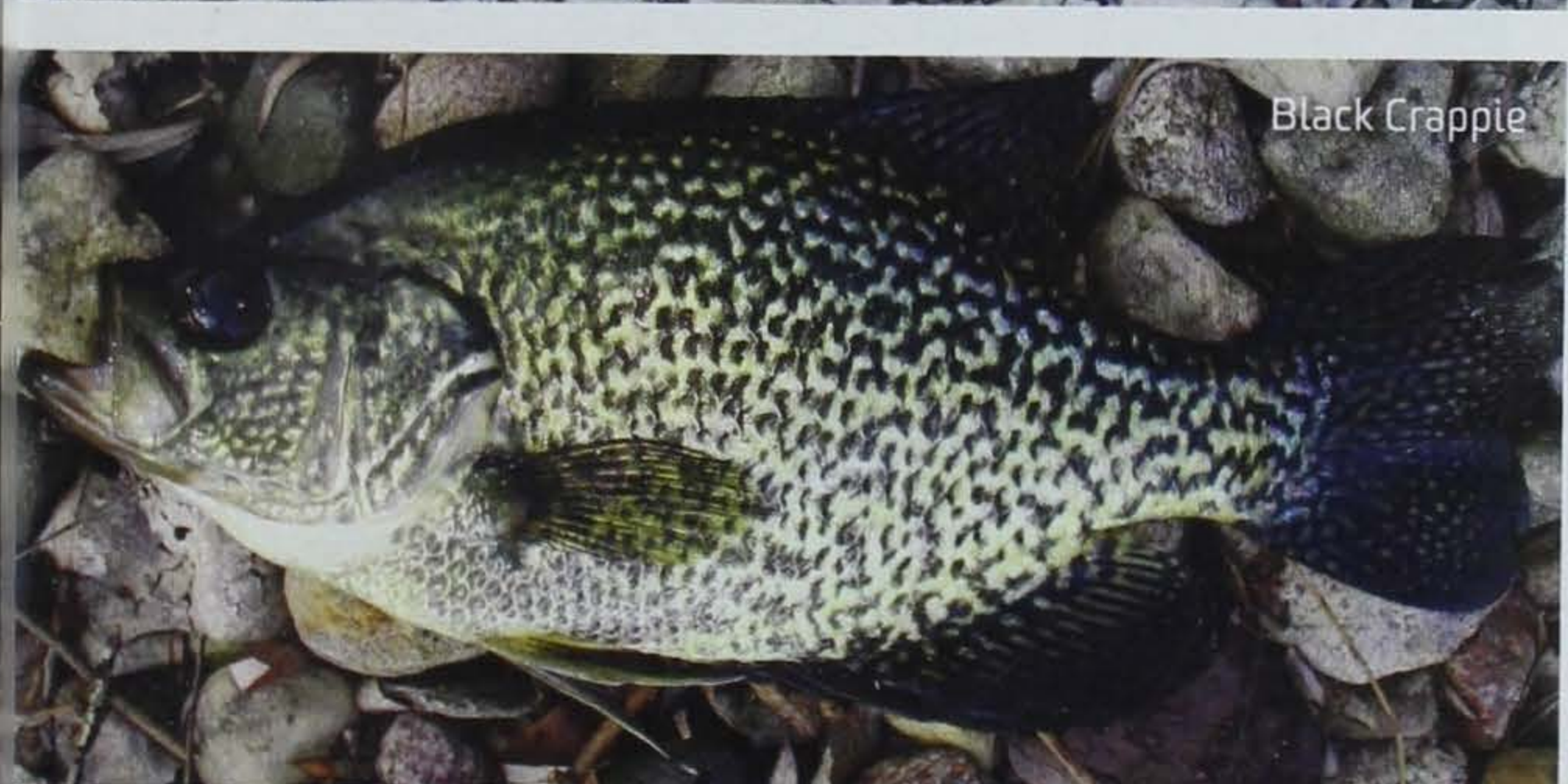
Brown Bullhead



Shovelnose Sturgeon



Yellow Bullhead



Black Crappie



White Crappie



Green Sunfish



Orangespotted Sunfish



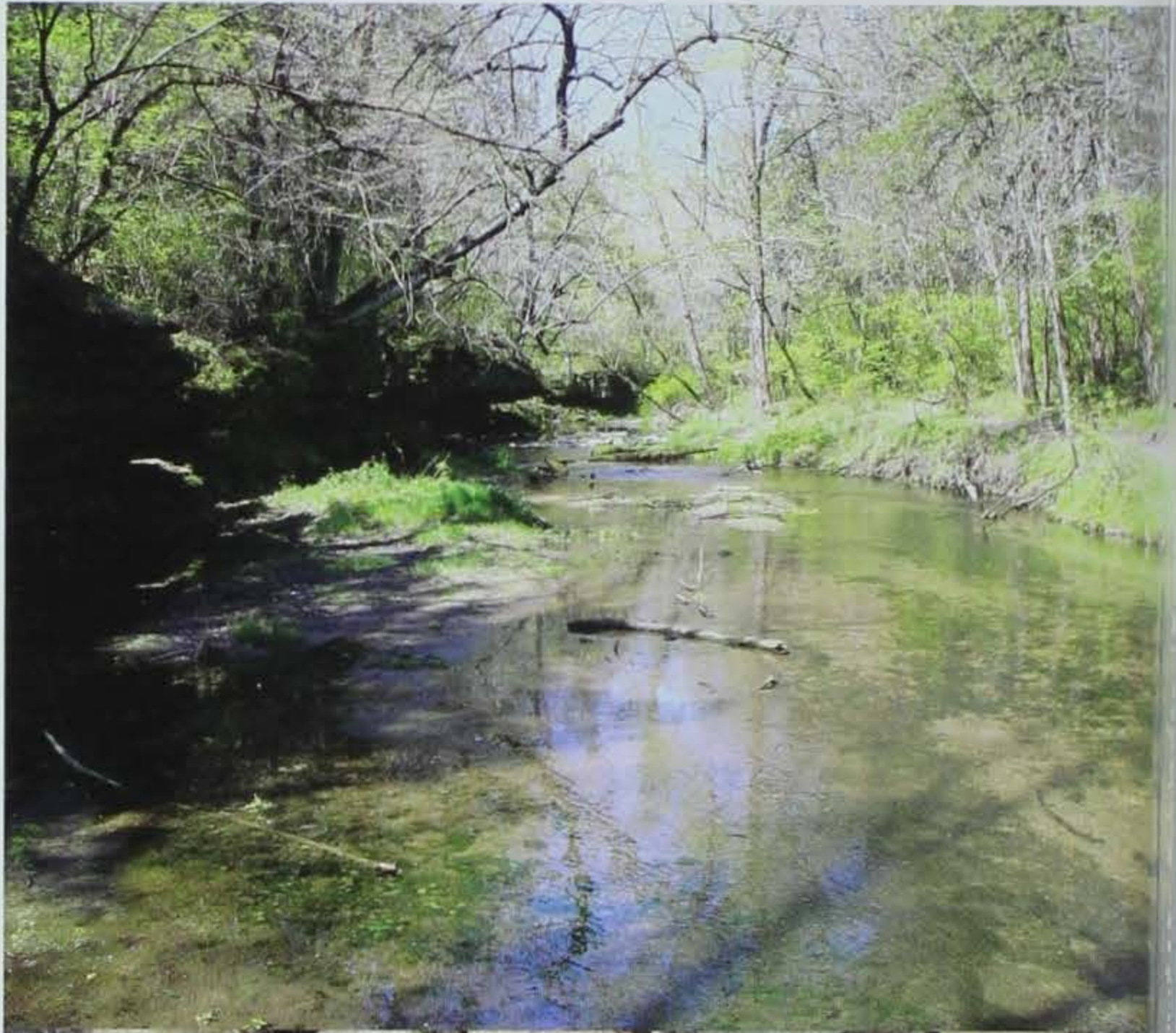
Warmouth



Redear Sunfish



Muskellunge



Brown Trout



Yellow Perch



Rainbow Trout



Walleye



Brook Trout

trailer to fish a jig and a fly on 4-pound test line was most effective. He also uses a fluorocarbon leader so the line virtually disappears in the water. Add brook, brown and rainbow trout to the list.

During the course of the pursuit, Percival added seven fish large enough to qualify for the DNR's Master Angler award: a 10-inch bluegill, 9.5-inch rock bass, an 11.25-inch yellow bass, a 7-inch warmouth, a 13-inch yellow perch, a 35.5-inch flathead catfish and a 21.25-inch largemouth bass.

The hot spot has been (almost) in his backyard, the familiar pond he's fished throughout his life. He caught four of the seven lunkers in his grandparents' farm pond. Yellow bass, yellow perch, bluegill and rock bass out of his family farm pond qualified as Master Angler fish.

He caught the Master Angler warmouth at the Conklin Fish Farm near Griswold, a recreational area managed by Cass County.

He was fishing for muskellunge at Sun Valley Lake in Ringgold County when he caught the largemouth bass. And the flathead catfish was also a serendipitous find. He was fishing below the hydroelectric dam in Ottumwa. "That was before I ruled out threatened or endangered species," he says. "I was hoping to catch a lake sturgeon, even though I didn't think I would." Instead, he ended up with about a 20-pound flathead. Another Master Angler fish.

Aside from Percival's goal to catch 32 species of fish in one year, he yearned for the Gold Medallion by catching 10 fish species that qualify for Master Angler awards. He fell just short, yet still walked away with the Silver Medallion.

By summer's end, the obsession was paying off. Percival had 29 of his 32 fish in the creel, including about 13 that he'd never caught before. Remember that beautiful orangespotted sunfish? That was one of the bigger challenges.

While the orangespot swims throughout the state, Percival found this diminutive sunfish in the North Raccoon River, below a lowhead dam in Adel. "It tops out at about 4 inches. It's very small and usually not caught, because most people don't use a hook small enough for this species."

To enhance his chances for any species, he recommends getting on the Iowa Sportsman forum and just ask: "Where is someplace you've caught a 'name your fish?'"

"Once you've found a spot, a lot of times you have to go back again and again." For the orangespot, he hit "three to four spots in three to four streams before I got one."

"They're found everywhere, but they are not common. They prefer slow, unmoving water like an oxbow. The water behind the dam in Adel was so low it just formed a big pool. One day I looked down and noticed two fish with neon gill covers and thought I'd found them. I went back the next day with a 1/64-ounce jig with part of a Berkley gold wax worm on it." Voila. One orangespotted sunfish.

By September, Percival was back at school, facing a heavy schedule as a new student in the University of Iowa

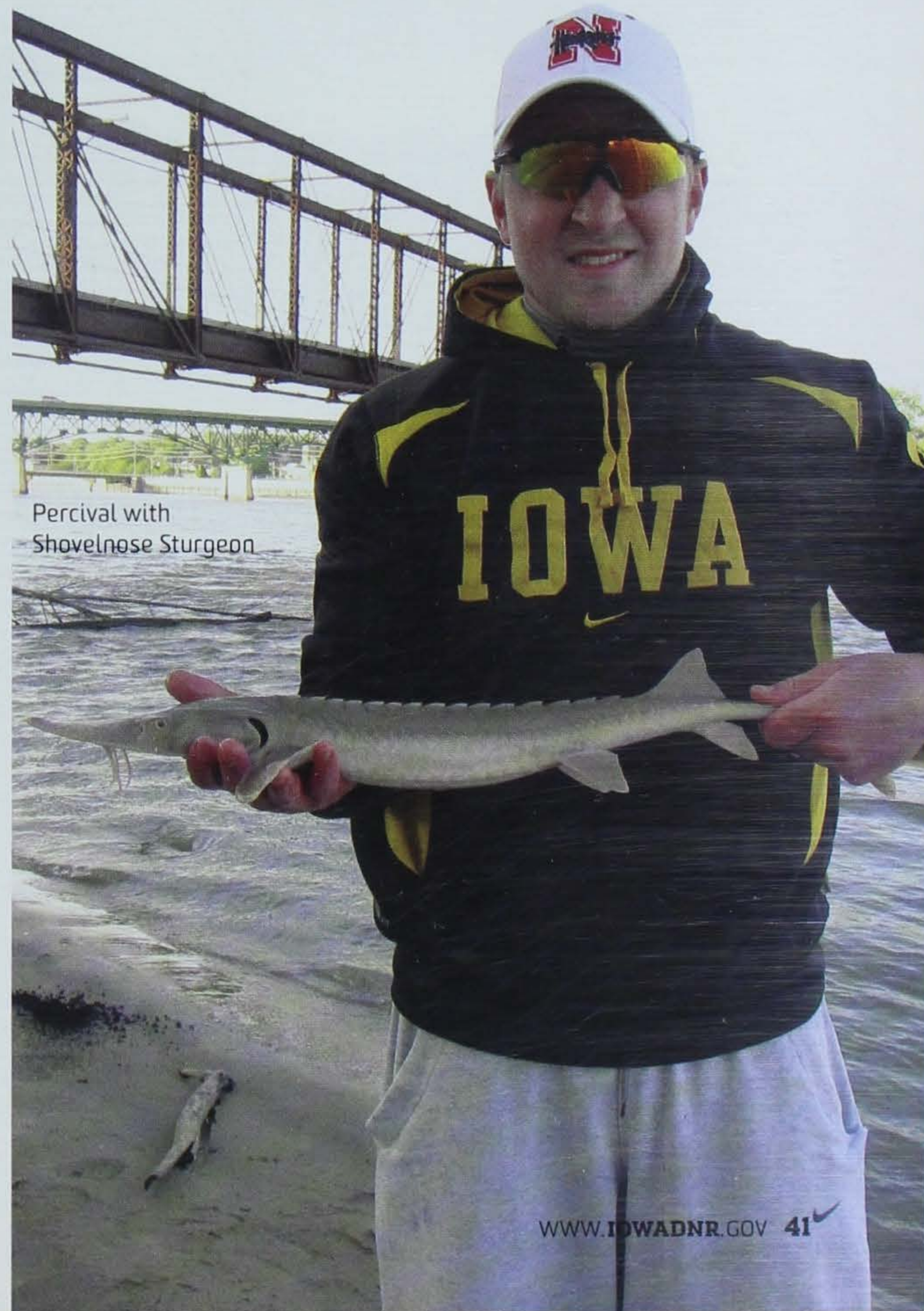
dental school. With time at a premium and three fish left on his wish list, he could find only a few hours to devote to his quest. The sauger, saugeye and pike remained elusive.

Fortunately, he's in the right place for saugeye. The only place in the state he's likely to find these walleye/sauger crosses is on the Iowa River below Coralville Dam. Just the ideal spot for a harried dental student to slip out for an hour or two of relaxation.

His strategy for the pike and sauger was a boat trip to the Mississippi River near Davenport with his dad. They've been out on Pool 12 north of Dubuque before. "We got skunked," he says. "That's the first time we'd fished a big river in a boat. You have to adjust to the current. It's a little intimidating."

Even though the last boat trip of the season was not successful, Percival plans to continue the hunt this year. He'll keep his memories intact, too, with photos of all the fish he's caught. Each one is meticulously recorded—with lighting, pose and background carefully arranged. "I put as much effort into the photography as I put into catching it."

That's the kind of attention to detail that spells success whether in angling or studying. Good luck Zach. 🐻



Percival with
Shovelnose Sturgeon

DROWNING

7 TIPS TO AVOID A WATERY DEMISE

STORY AND PHOTO BY BRIAN BUTTON



Last summer, near record drownings affected a wide swath of outdoor users, from people swimming in lakes and rivers, standing on docks, wading in rivers to warm-weather anglers, ice-anglers and boaters. As hotter summers push more Iowans toward water, drownings can increase. Luckily, many of these deaths are preventable.

The main causes of drowning 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, location and seizure disorders. Heed these statistics and top 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. Swimming is a life-saving, life-long skill worth

knowing. Bolster your abilities or learn to swim by taking formal swimming lessons. Inquire at municipal pools, colleges and YMCA facilities.

Life Jackets

Based on U.S. Coast Guard statistics, nearly 75 percent of boating deaths result from drowning. In nearly 90 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 boating deaths nationwide occurred on boats that were anchored, docked, moored or drifting.

Beer & Booze

Among adolescents and adults, alcohol is involved in up to 70 percent of water recreation deaths, nearly a quarter of emergency room visits for near-drowning and about one-in-five boating deaths. Alcohol alters balance,



DROWNING FACTS

- Drowning deaths in the United States average 10 a day.

- 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 department 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, 29 Iowans drown annually with 18 hospital admissions for near-drownings.

- More than half that survive a near drowning but require emergency care will require further 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.

coordination and judgment. Its effects are amplified by sun exposure and heat. Stay sober near waterbodies.

Learn CPR

CPR from a bystander is proven to save lives and improve outcomes for near-drownings. The quicker CPR begins, the better the results. In the time needed for paramedics to arrive, your CPR skills could save a life or prevent permanent damage. If already certified, learn the latest techniques and refresh your 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. A submerged person is

often difficult to find due to Iowa's low-visibility water.

Know the Terrain

Iowa rivers and lakes can have sudden dropoffs, holes, submerged shelves, foot holds and rock ledges. Exercise caution near all waters. Current strength is often deceiving even for 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 hold watercraft and occupants underwater. Avoid dropoffs near sand and gravel bars. On large rivers, sudden dropoffs can measure more than 5 feet, posing hazards for children and weaker swimmers. Re-circulating, powerful currents from even small low-head dams are unforgiving drowning machines. Stay clear above and below all dam areas. 

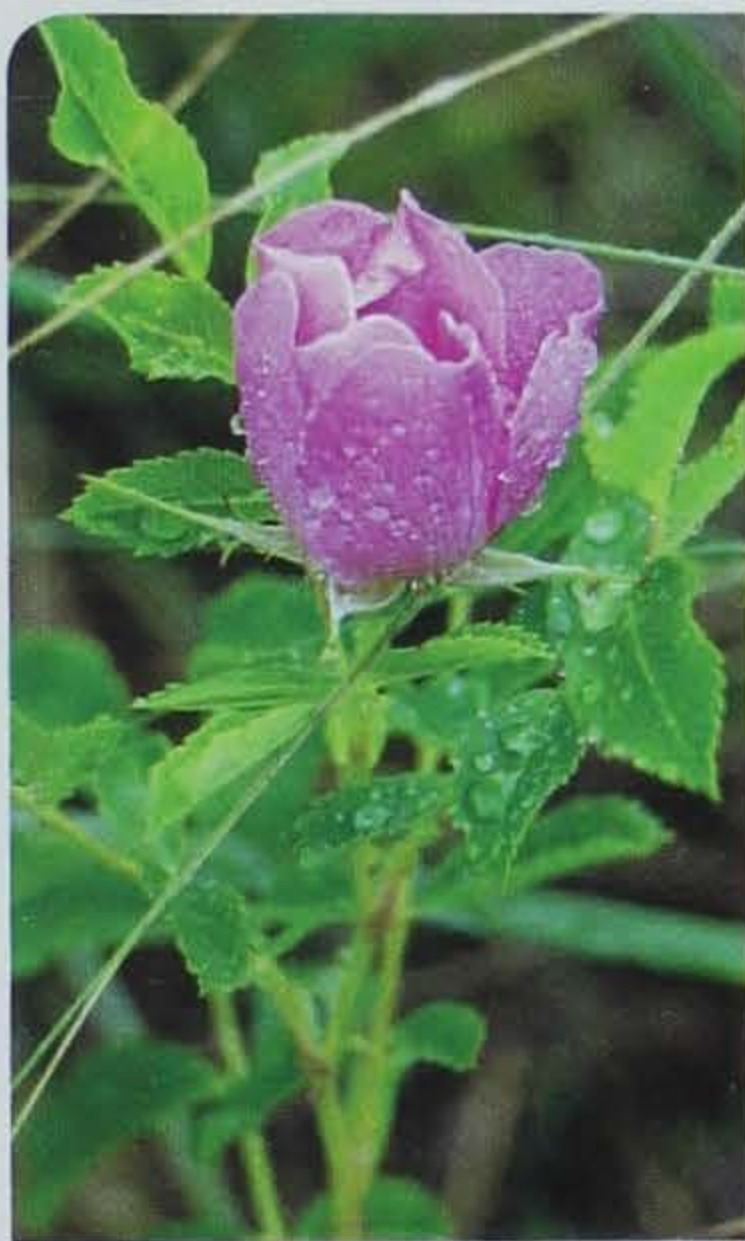


This Iowa endangered yellow mud turtle (*Kinosternon flavescens*) was found during the annual field day at Muscatine County's Big Sand Mound Nature Preserve in 2012. The annual field day is the only day a portion of the preserve is open to the public and reservations are required. It occurs only once every three years. **AT RIGHT** are the wild rose, Iowa's state flower; a view of Big Sand Mound from Beatty's pond; and Dr. Tom Rosburg of Drake University, examining a tiny American toad. The sand mound prairies are one of Iowa's most unique ecosystems. Unusual dunes shift in the winds, prickly pear cactus beds flourish, reptiles sunbathe and the area mimics the arid American Southwest more than the nation's breadbasket.

RECOVERY IN THE LAND OF THE LOST

At Big Sand Mound Nature Preserve, a dazzling sand prairie next to the Mississippi River, *ornate box and yellow mud turtles, race runner lizards, blue grosbeaks, hoary puccoon and sand primrose* shows what people can save when they value it.

BY MINDY KRALICEK PHOTOS BY MINDY KRALICEK AND ERIC OSMUNDSON



At 4:30 a.m. the night's rain has diminished to mist and it floats through the open car window. It's time to hit the road to make the "early riser" programs of the field day at Big Sand Mound Nature Preserve in Muscatine. Scheduled to start promptly at 5:30 a.m., the maxim is "Get there on time so you won't be left behind."

Parked in front of the Monsanto Recreation Building, the mist has turned into a downpour. Inside, Connie Veach, Monsanto's environmental coordinator, greets 20 or so early risers with a wry smile and coffee. Nothing to do until the rain lets up.

Twenty minutes later the rain moves westward and the early risers split into two groups: birdwatchers are with Jessica Bolser of the U.S. Fish and Wildlife Service; those interested in a preserve overview are with biologist Dr. Tom Rosburg of Drake University.

Following Rosburg into the preserve, it's a short walk to a graveled levee next to Spring Lake. In the mist, thousands of tiny American toads hop from grassy banks onto the gravel. Newly transformed from toadlets to toads, they are leaving the pond for their new life on land.

"This area was wetland until the river levee was built at the turn of the century and groundwater was extracted for irrigation, industry and urban development. That left this area dry," explains Rosburg. "In order to bring back the wetland, a hole was made in the levee to fill the wetland during the wet season and the water recedes during the dry part of the cycle. That change has brought the wetland animals, invertebrates and herptiles back."

Today, the wetland is dry except for a small pond in the deepest area of Spring Lake, where Monsanto dug it out to hold water during drought.

The birdwatchers pass us with Bolser pointing out common yellow throat, indigo bunting, catbird and a field sparrow that just let loose its insect-sounding trill. Diffused lighting from dark clouds pumps up the feather colors.

Dampness creeps up our pant legs; shoes and jeans are soaked toe to thigh.

Beyond Spring Lake is sand prairie in three visible terraces formed by a sequence of rainfall patterns and climate changes over thousands of years.

Our group comes upon a pitfall screen fence used by Mount Mercy University biology students to trap small animals for population studies. Small animals will follow the fence until there is a break where plastic buckets are buried. Some have lids that sway with the weight of the animal that crosses it, and the animal falls in. Other pits are open, but just as likely to contain small animals.

Beetles and spiders are the most numerous creatures in the pits, but one bucket contains a female six-lined racerunner lizard. Lizards eat crickets, grasshoppers, beetles, spiders and caterpillars, which they mash with their strong jaws. Although the lizard is trapped, it has food until the researchers return to record, measure and release what's been captured.

Rosburg points out many species of plants growing in the sandy dry soil. Although productivity is poor in the sandy soil, diversity is high because of the sunny conditions. Due to the early

2012 spring, the plants are ahead of their normal growing schedule. He points to flowers that don't usually bud until August or September—but this June they are here.

As we hike upward, Rosburg points out several varieties of milkweed and catchfly. Catchfly produces a sticky substance at the base of its flowers that catch small insects. There is also hoary verbain, bush clover, horse nettle, purple prairie grass, June grass, pennyroyal and cranesbill.

Rosburg spies a western ribbon snake and someone in the group snatches it. Ribbon snakes are active in daytime and more aquatic than garter snakes, which is why it is in Big Sand Mound amid its ponds and marshes.

Along the property line are many non-native, invasive autumn olive shrubs. Their leaves are tough and leathery, dull green on top and silver underneath. "It's difficult to get rid of," says Rosburg. "An herbicide will probably be used, as cutting or burning it creates more shrubs. It looks nice and smells good, but it shades out native plants."

Border fence posts have several bluebird houses attached. Rosburg opens the lid of the first and it is occupied by baby swallows. All the birdhouses checked contain baby swallows. Their parents dart and circle above our heads as the sun burns away the last of the mist.

Rosburg moves ahead with speed, leaving stragglers behind. Bob Bryant, a naturalist at Nahant Marsh Education Center in Davenport, brings up the rear and stops at a decaying branch on the ground with a greenish-white plant with bright red tops growing from it. "This isn't a plant," says Bryant. "It's British soldier lichen, named for the red-coated soldiers who fought against the American Revolution."

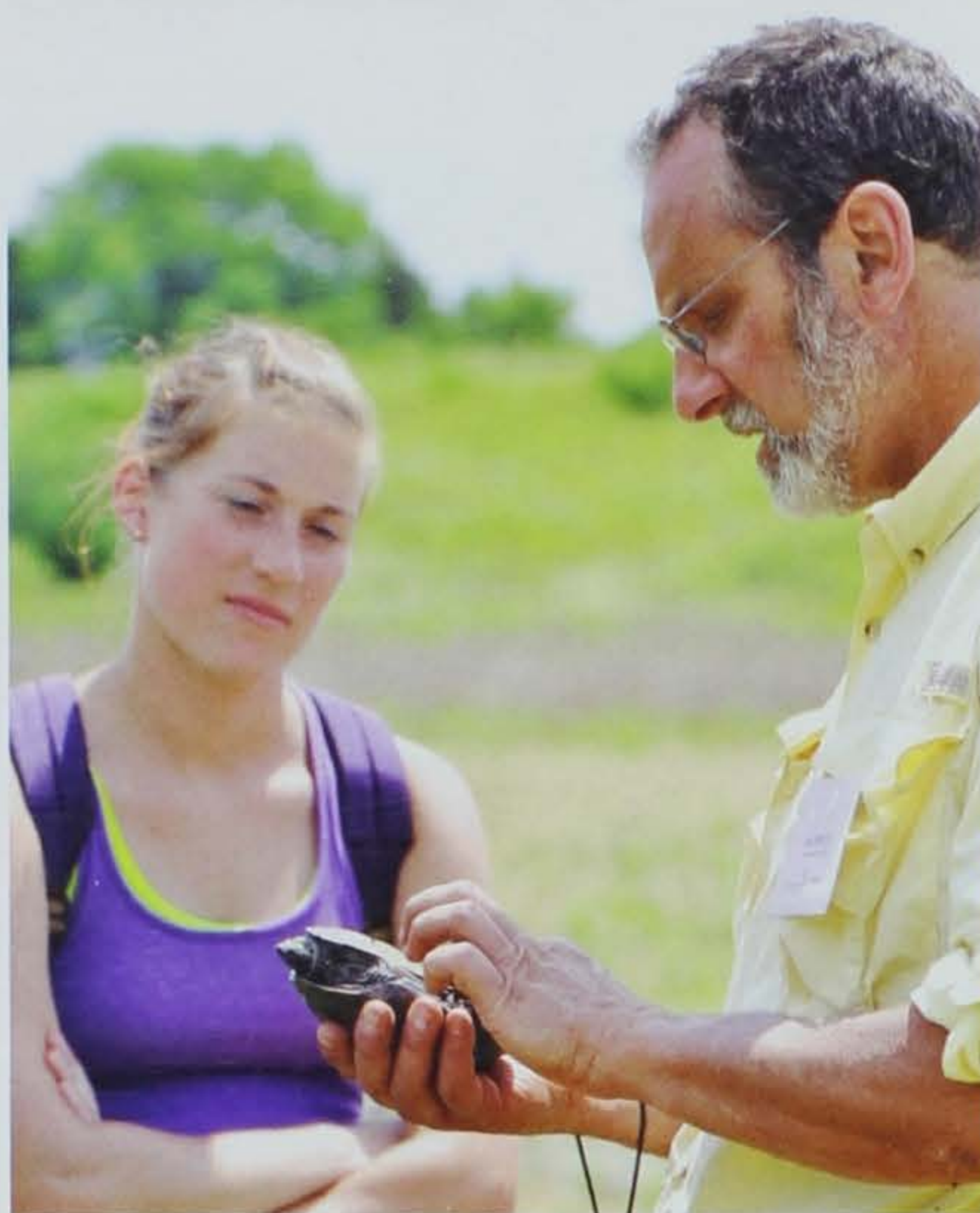
Beautiful, wide-crowned shrubs bloom. They are identified as the common hoptree or wafer ash. "Some think the shrub's odor stinks, while others like the smell. The fruit is a round wafer-like winged seed," informs Rosburg.

We take a turn through a



LEFT: An ornate box turtle (*Terrapene Omata*), is found among woodland debris at Big Sand Mound. Mount Mercy University biology students check a pitfall fence line in search of small animals inhabiting the preserve. Rosburg, arms raised, leads a group of early-risers on a tour of the preserve. **BELOW:** A western ribbon snake (*Thamnophis proximus*), similar to a garter snake but more aquatic, poses patiently for a photo.





stand of trees and discover an ornate box turtle. A few more are found in the woodland debris. A later group will find 14 in that same stand.

As we join the birders walking back to the Monsanto Recreation Building, they tell us they spotted a blue grosbeak—a definite high point for a birder—as well as an eastern kingbird, a pileated woodpecker and many goldfinches.

Professors and Boy Scouts

Gathered at the check-in point are a hundred or so adults and college students waiting to begin the regular Big Sand Mound Field Day activities. Boy Scout Troop 560 from Cedar Rapids is there to assist the groups with navigation. This troop also helped remove downed trees and brush so yellow mud turtles and hatchlings can travel from hibernation areas to the preserve's ponds to drink and eat. Troop 560, along with Troop 160 of Muscatine, helped erect 3,225 feet of net fencing with Mount Mercy University research students.

Choices include either a three-hour tour of Big Sand Mound or attendance at two short session tours or talks. After pondering whether to join a session about photographing nature, the wetlands of the preserve, prairie plants, birds of prey or handling amphibians and reptiles, I join the turtle and other fauna group led by Neil Bernstein, Mount Mercy University biology professor.

Bernstein and his students have monitored yellow mud turtle populations here for more than nine years, a study started by retired Drake University professor

Jim Christiansen in 1988. This is the largest population known to exist in Iowa. Three of his students and his daughter will help check the pitfall traps.

Again, the first stop is Spring Lake with its thousands of tiny hopping toads. He says changes in hydrology during the last 4,000 to 8,000 years isolated this sand prairie from sand prairies southwest of Iowa. Female yellow mud turtles are first to come to the ponds to feed and drink in April. Then males arrive. Females leave first to lay eggs, with males following later. Eggs hatch in the fall, but hatchlings remain buried until spring warms the sand. There are no mud turtles to view at Spring Lake. The early warm weather has affected the turtles' normal schedule as well.

We head to the pitfall traps where the female racerunner is waiting to be weighed and measured. Bernstein says to hold the racerunner under its head. Grabbing it by the tail will cause it to drop its tail.

After peering into buckets of trapped beetles, Bernstein quotes British biologist J.B.S. Haldane (1892-1964). "The Creator, if he exists, has 'an inordinate fondness for beetles.'" This alludes to the fact that there are more types of beetles than any other form of insect, and more insects than any other kind of animal.

A deer mouse is found in one trap. His students often find prairie pocket mice, too. The last bucket holds an eastern garter snake. Both are measured and released.

Bernstein's students have found four adult yellow mud turtles and two hatchlings in the pit traps at Beatty's Pond,



OPPOSITE PAGE: Mount Mercy University biology student Taylor Helms and Dr. Bernstein study a 10-year-old yellow mud turtle found at the preserve. The turtle is named for its bright yellow plastron (bottom shell). The deepest part of Spring Lake is where turtles and toads come to feed, drink and mate. A Fowler's toad is discovered in woodland debris and sand. **THIS PAGE:** The public gathers at the Monsanto Recreation Center for the field day. Dr. Mark L. Anderson, archaeologist, discusses prehistoric cultures that lived in the area. A visitor examines a hoe like those used in the Late Prehistoric period. At left is a female six-lined (count the yellow and dark stripes) racerunner (*Cnemidophorus sexlineatus*) caught in a pitfall bucket.

a larger pond at the preserve. No yellow mud turtles have been caught in the last two weeks and students may start checking bullfrog stomach contents to see if they are eating hatchling mud turtles.

Prehistoric Cultures at Big Sand Mound

On top of a ridge, a perspiring but rapt group listens to project archaeologist Mark Anderson's account of prehistoric cultures that lived here.

"This preserve was farmed until the 1960s and was sold in 1962 to Monsanto and MidAmerican Energy. Fortunately, U.S. industries are now interested in preserving large tracts of land and this property is benefitting from that trend," begins Anderson.

"Not much is specifically known about the cultures at Big Sand Mound," says Anderson, who also serves on the preserve's advisory board.

He says sands accumulated here between 20,000 and 17,000 years ago, forming the mounds. A cool, wet climate eventually gave way to warmer and dryer conditions over the next 8,000-plus years. Bands of hunter/gatherers roamed the upper Midwest. They probably relied on hunting deer, elk and other large game with darts and spears, and small game captured in pit traps, with plant foods used in the warm season. Ultimately, Native Americans transitioned from highly mobile hunter/gatherers with large ranges to more seasonal camps dependent on local resources.

Big Sand Mound has three distinct erosion-formed

terraces. Anderson says the highest—Gunder Terrace—was likely stable by about 6,000 years ago. Archaic and later Woodland period cultures could have occupied this landscape. Environmental change was occurring rapidly, with the expansion of prairie and later, deciduous forests. People flourished and populations slowly grew. The hunter/gatherer way of life continued as ground stone tools came into wide use. By the end of the period, burial sites began to occur, along with experimenting with growing plants. This terrace could contain buried sites.

Anderson leads the group down to the second terrace—Robert's Terrace—likely stable around 2,000 years ago. One of the prominent cultures of the time was the Hopewell. Networks of trading brought obsidian from the Yellowstone area, copper from Lake Superior and shells from the Gulf. Domesticated plants were tended and mound building was an integral part of their culture. Political and social hierarchy was clearly developed.

"As you look at the evolution of Native Americans, you find the population grew as horticulture increased, and as cooking with pots developed. This allowed greater caloric intake. People slowly stopped moving seasonally and developed larger villages," says Anderson. "Trading with other Native Americans appears to have occurred more regularly. Use of bows and arrows arrives in the upper Midwest during this period."

The lowest—Camp Creek Terrace—formed about 200 years ago.

"By about 1,200 years ago, people in the Big Sand

Mound vicinity had improved food production, pottery technology, storage methods and greater social and political complexity," says Anderson. "The Oneota culture occupied this area and likely later became known as the historic Ioway peoples, our state's namesake. The Sac and Fox (Meskwaki) tribes go back several hundred years ago. They moved out of the western Wisconsin area to eventually live here."

The Find

As we walk to the Monsanto Recreation Building, a couple of tent classrooms have been set up and I catch the end of the talk on creatures great and small. There is a tiger salamander, large American toad and several snakes to hold. One of Bernstein's students holds a black turtle, about 7 inches long, that she found several yards away. A crowd gathers.

She gently turns the turtle over. The plastron is bright yellow. "It's a yellow mud turtle," heralds Bernstein. He examines the long, front claws and checks the distance from tail to vent (cloaca). A male's vent is located further away from the body than a female's. Bernstein counts rings on a scute, or shell section, and points to one with a notch.

"He's about 10 years old and we caught him two years ago, too," he tells us. "This is a great find. It's time we let him get back to his life," Bernstein says.

He carries the turtle away and releases him gently in cream-colored grass in the direction of the wetland. Excitement turns to sadness as I watch the turtle quickly stroke his way into the shadows of trees and out of sight. I want to follow the turtle, pick him up and run with him—take him where he'll be protected from predators, vehicles and everything that could hurt him.

Bernstein watches me and I see a flash of emotion in his face. "He'll be alright," Bernstein says, and I fall in step with him, back to where his students wait.

Trap Line at Beatty's Pond

Bernstein and the students gather in two vehicles to grab a quick lunch. Then, it's off to the MidAmerican Energy side of the property and a remote access point on a bumpy road to the area

around Beatty's Pond.

We stop the cars at a woodland and climb out. Clouds have moved in and the woods are dark, but the browns, beiges and greens are vibrant. The quiet is welcoming and eerie at the same time. A field sparrow wings past us as we walk to a clearing where the pitfall fence begins.

We follow it, winding around fallen branches, trees and brush, watching our steps to avoid the many small Fowler's toads. An eastern garter snake is surprised and caught as we make our way uphill. A male racerunner, a gorgeous blue, is caught in a pit. Larger Fowler's and American toads are caught, and then a beautiful ribbon snake. Lightning flashes in the distance. More tiny toads. All are counted, measured and released.

Beatty's Pond spreads out before us, loaded with water lilies. Trees flank water's edge. Lightning strikes closer and Bernstein motions. "I don't want you caught out here in lightning. Go back to the cars and I'll finish the trap line and meet you back there."

The students tell him no way; they want to finish the job. Then there is a downpour. We take shelter under tall bushes, pulling hoods over heads, unprepared for this turn in weather.

Bernstein notices a large dead map turtle in the grass. The carapace and plastron are in great shape, but it stinks. Cause of death is beyond guess.

Lightning continues and rain pours. I signal to others that I am going back and turn tail to the pounding rain.

The trap line is about a mile and a half long, and it's another quarter mile through woods to the car, so it means backtracking almost that far with nothing familiar in sight except the trap line. I stay next to it, trying to jog when I can. The path turns slippery and I slow for footing. There's something about being in a new place and not sure where you are going that conjures up Rod Serling's voice—a sound wave into the Twilight Zone. Then I see the safe haven of the Jeep Cherokee, paint shining in the rain, wheels sunk in mud, on the edge between woodland and prairie.

In 10 minutes the rest join me, drenched and tired, eyes shining with adventure. We say our thank-yous and good-byes and head for the highway home. 🐢



OPPOSITE PAGE: A blue racer (*Coluber constrictor foxi*) was caught slithering through the grass. An eastern garter snake (*Thamnophis sirtalis*) caught in a researcher's pit-fall trap gets a visitor's lookover before it is released. **THIS PAGE:** The endangered yellow mud turtles appear to be in decline at Big Sand Mound Nature Preserve.



Yellow Mud Turtles: A Perilous Journey at Big Sand Mound

During a period of hot, dry climate about 8,000 years ago, yellow mud turtles (*Kinosternon flavescens*) made their way to the sand prairies of Iowa, Illinois and Missouri. Their small legs pulled them through oxbows, marshes and backwaters in the spring for hydration. After feeding and mating, they returned to the sand prairies for nesting in mid-July. Their hatchlings broke through their shells in the fall, but remained buried in the sand, waiting for spring. When warmth returned, the walnut-sized hatchlings began their journey to find water and feed on dead fish, crayfish, insects and snails. Their journey took them several hundred meters to a large pond they'd never seen. Raccoons, skunks, hawks, eagles, foxes, even crows, are their predators on land. In water, fish and larger turtles feed on them, but some survive to make the trip back to the Big Sand Mound—they've done so ever since.

As part of a larger area known as Muscatine Island, the sand prairie was

drastically altered since settlement in the mid-1800s. People increased the size of Muscatine Island, lowered the water table, and dried up oxbows and wetlands. Trees encroached the sand dunes. Wildlife in the unique environment found itself homeless.

Upon purchasing the 510-acre site, Monsanto and MidAmerican Energy decided to conserve and enhance the ecological communities, manage endangered species, protect archaeological features and accommodate scientific research. By their efforts, at least 352 native plants and 30 rare plants and animals, including copperbelly water snakes, smallmouth salamanders and plains pocket gophers are thriving. To protect yellow mud turtle populations, a DNR-approved trapper removed raccoons and volunteers cut encroaching woody plants. Water flow in the main oxbow from the Mississippi River was reconnected by culvert. Wetlands were deepened. Prescribed burns removed trees to restore prairie.

In 2008, the area was honored by the

Wildlife Habitat Council for voluntary private sector involvement for biodiversity conservation.

Still, yellow mud turtle populations decline, as monitoring by Professor Neil Bernstein and students show. "Preservation without focused management may not be enough to maintain the species, even within a protected habitat," says Bernstein.

Then there is the problem with fragmentation. Surveys in 2007 outside of Big Sand Mound found no yellow mud turtles. Lacking nearby populations of mud turtles large enough to attract the Big Sand Mound population for mating, it is doubtful the isolated population will survive.

"A majority of the mud turtles found in 2009 were unmarked. It's likely the adults are not living to breeding age (seven years), which explains the lack of hatchlings," says Bernstein. "However in 2012, 10 adults at Spring Lake were marked. That's a positive sign, but total numbers found have continued to decline."

THE CORAL REEFS OF JOHNSON COUNTY

BY CHARLES C. MONSON PHOTOS BY JESSICA MONSON AND CHARLES C. MONSON

Coralville Lake in Johnson County is a popular destination on any lazy summer day. However, the throngs of people who poured into the park at summer's end in 1993 didn't come for a round of disc golf, some fried mushrooms at the Funcrest Dairy & Grill or any of the other standard attractions. They came for a glimpse of the distant past. The catastrophic floods of 1993 opened a window on an ancient sea floor, and creatures that died in those sunlit waters some 375 million years earlier were suddenly exposed to the air. Flood-weary Iowans, ready for a pleasant surprise after a summer of battling nature, flocked to Coralville Lake to see the fossils, which dated back to the Devonian period.


Some 129 years earlier, the world's most famous naturalist also visited Johnson County with Devonian fossils on his mind. What he found there, he believed, helped prove a theory about the growth of North America out of the primeval seas. His ideas reflected some of the greatest scientific debates in history: how old is the planet and did life develop through evolution? As a parting gift, he helped give the city of Coralville its name.

Naked Bedrock


There is a massive scar on the landscape around

Coralville Lake. It's a wide swath of naked bedrock that runs between green hills on a path toward the reservoir's tailwaters, and it's called the Devonian Fossil Gorge. When you stand at its uppermost northern end, you can see the lake's concrete spillway. That's where the reservoir, swollen by floodwaters, escaped its boundaries. Thousands of cubic feet of water per second coursed over the spillway for the next month. The torrent carved into the road and a campground beneath, stripping away soil and rock to reveal underlying Devonian limestone. When the waters subsided, park rangers discovered a wealth of fossils on the newly exposed limestones—from trilobites to armor pieces from the giant predatory fish *Dunkleosteus*. The story garnered national attention, and a quarter million people visited the site in its first three months. In the following years, rangers and local geologists set up open-air exhibits and an interpretive trail and collected some of the most spectacular fossils for display in the park's visitors' center.

If you start your visit at the pavilion on the east side of the gorge and amble down the path toward the north, you will shortly come across a rock ledge that's chockablock with fossils. It's studded with a large variety of animal remains—discs from crinoid stems, lumps of stromatoporoid sponge and several other fossil types large



A close-up of a fossil-laden block of "Iowa City marble" or Cedar Valley limestone in the wall of the Old Capitol Building on the University of Iowa campus. Excellent fossil remains of marine life that inhabited the clear, warm, shallow Devonian seas can also be observed below the spillway at Coralville Lake at the Devonian Fossil Gorge. Look for solitary horn corals and larger colonial coral forms, especially *Hexagonaria* and *Favosites*. More rare are fossil trails of worm burrows through the sea mud and occasional trilobite fragments.

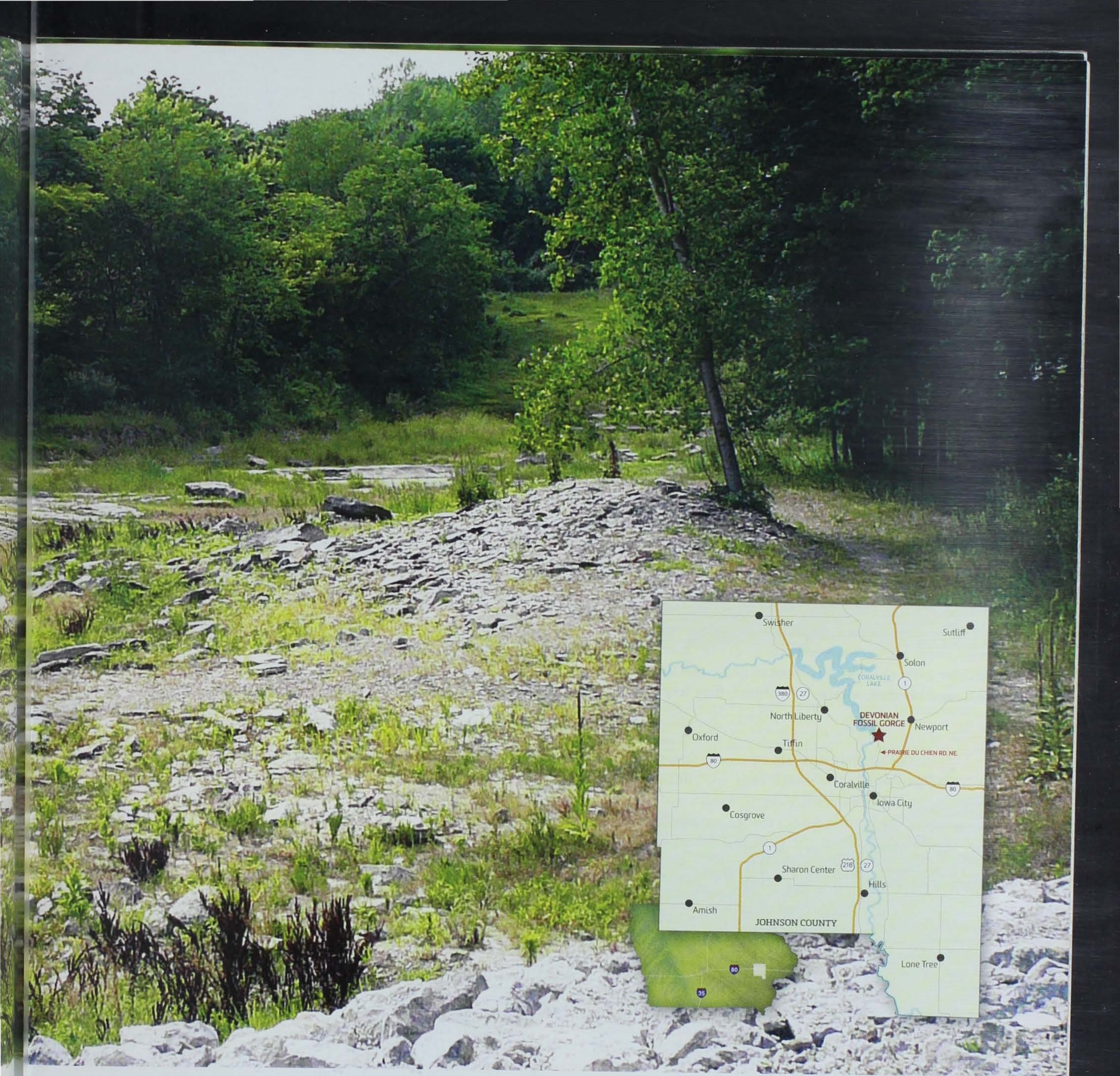


View from the gorge where historic floods in 1993 poured over the Coralville Lake emergency spillway to erode a deep channel into underlying bedrock. Today, visitors can walk across acres of 375-million-year-old Devonian-age sea floors to gaze at features normally hidden or glimpsed only in cuts along roads or quarries. The power of floodwater is still seen in the position of large slabs of limestone plucked from their bedrock foundation and moved downstream. Some slabs came to rest in an overlapping fashion—shoved together and slanted in the direction of the flood's flow.

and small—but the first things that will catch your eye are the heads of coral embedded in the rock. Some of them are covered with interlocking six-sided corallites, each of which was once home to an individual coral animal. This is one of the trademark fossils of the gorge, and its name is spot-on: *Hexagonaria*. Scientific names can be obscure—if someone asks you to bag them an *Anas platyrhynchos*, you likely wouldn't know that they're after a mallard—but the name *Hexagonaria* gets right to the point.

This ledge and the other rocks exposed at the gorge

are part of a geographically extensive set of rock layers which geologists call the Cedar Valley Group. In this particular layer—the Lower Rapid Biostrome—sponges and corals (including *Hexagonaria* and the honeycomb-like *Favosites*) are packed together so closely in places that it might remind you of a coral reef. If so, you wouldn't be alone in thinking that (more on that later). However, they did not form a large connected framework in the manner of true reefs, so paleontologists needed a different term to describe these fossil concentrations—



hence the word “biostrome,” which means “life layer.” The gorge is the most prominent local exposure of fossil-rich Cedar Valley limestones today, but these rocks are also exposed elsewhere in Johnson County along outcrops and old quarry faces. Geologists have found these biostromes can be recognized in adjoining states as well, giving us some idea of how extensive these great banks of corals and sponges must have been.

If you could go back in time to look at these wide undersea meadows firsthand, you would see a thicket

of sponges, corals and bryozoans set low to the seafloor against a cool blue backdrop of shallow tropical waters. Flowerlike creatures appear to sway in the current, but when you look close, you realize they point into the flow, not away. These are not plants but crinoids, creatures related to sea stars and sand dollars, and they make their living filtering food out of the current using petal-like “arms.” Shelled cephalopods jet over the sea floor, and in the background a huge shape looms: *Dunkleosteus* emerges from the blue, massive jaws agape.

This is the scene at Iowa Hall on the University of Iowa campus, some 15 minutes' drive from the gorge. Here, a diorama of the Devonian sea floor keeps company with Rusty the giant ground sloth, reconstructions of Iowa habitats like forests and sloughs and other exhibits. Step outside and walk a few dozen yards and you move forward hundreds of millions of years to Iowa's pioneer days. Now you're in the heart of campus and standing in front of the dignified Old Capitol building, former seat of Iowa government. Get up close to the stone walls and you'll see a familiar sight: large corals and other fossils in cross-section on the faces of some of the blocks.

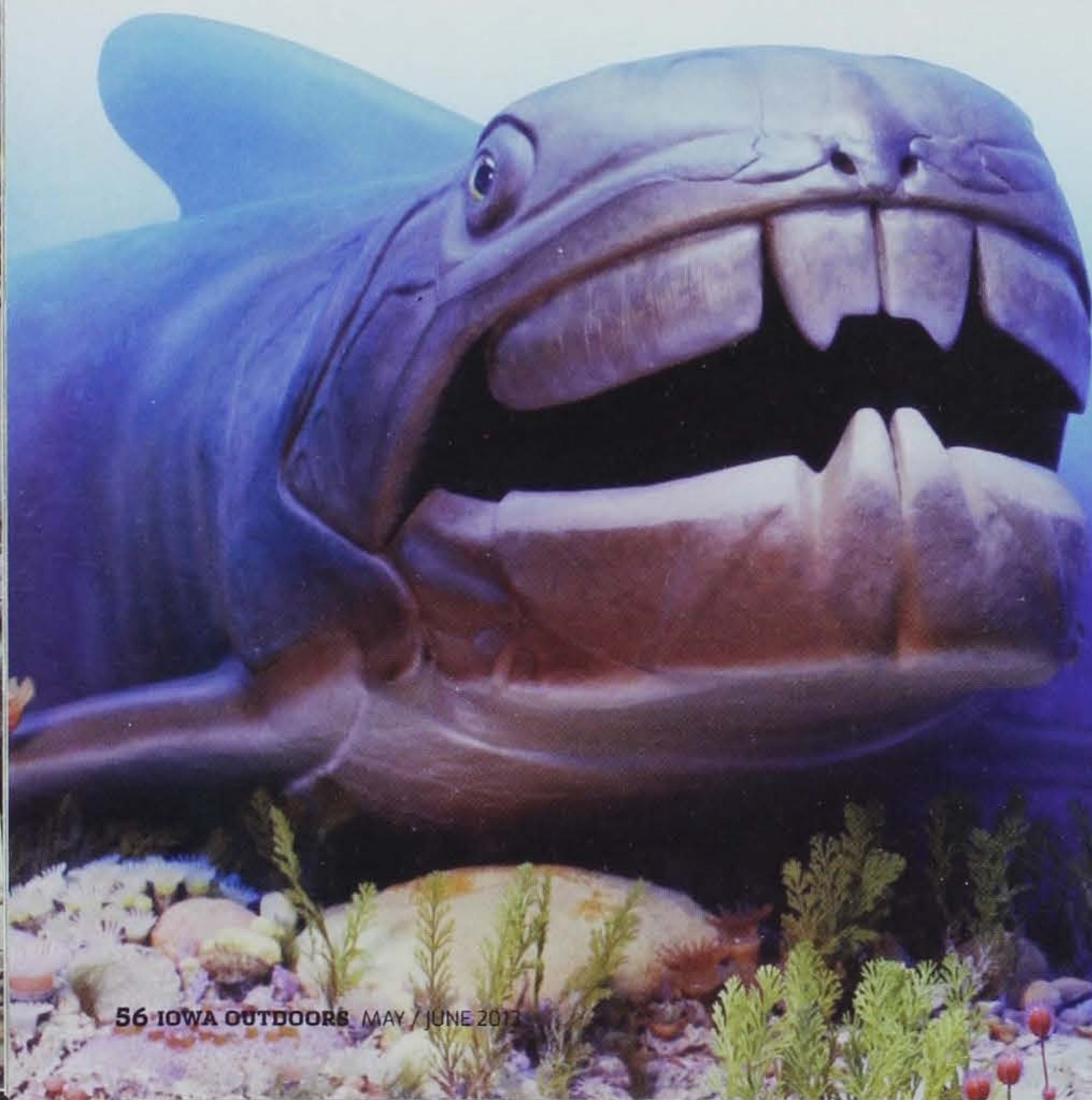
These are the Cedar Valley corals again, and it should be no surprise to see them, because their story is the story of Johnson County. Iowa City was created in 1839 to be the territorial capitol, and settlers took note of the coral-rich limestones. The corals gave the rock a striking appearance when it was cut or polished, and the limestones soon became well-known regionally as "Iowa City marble" or "birdseye marble." Small pieces were turned into cane heads and other curios, and large pieces were used for building stones (not just for the capitol building, but for homes and even milkhouses). The first steamboat to visit Iowa City returned to its home port with several cases of the "marble." One Iowa booster even showed off pieces at museums in Washington D.C. and London, where, he claimed, they were much

appreciated for their "unique beauty."

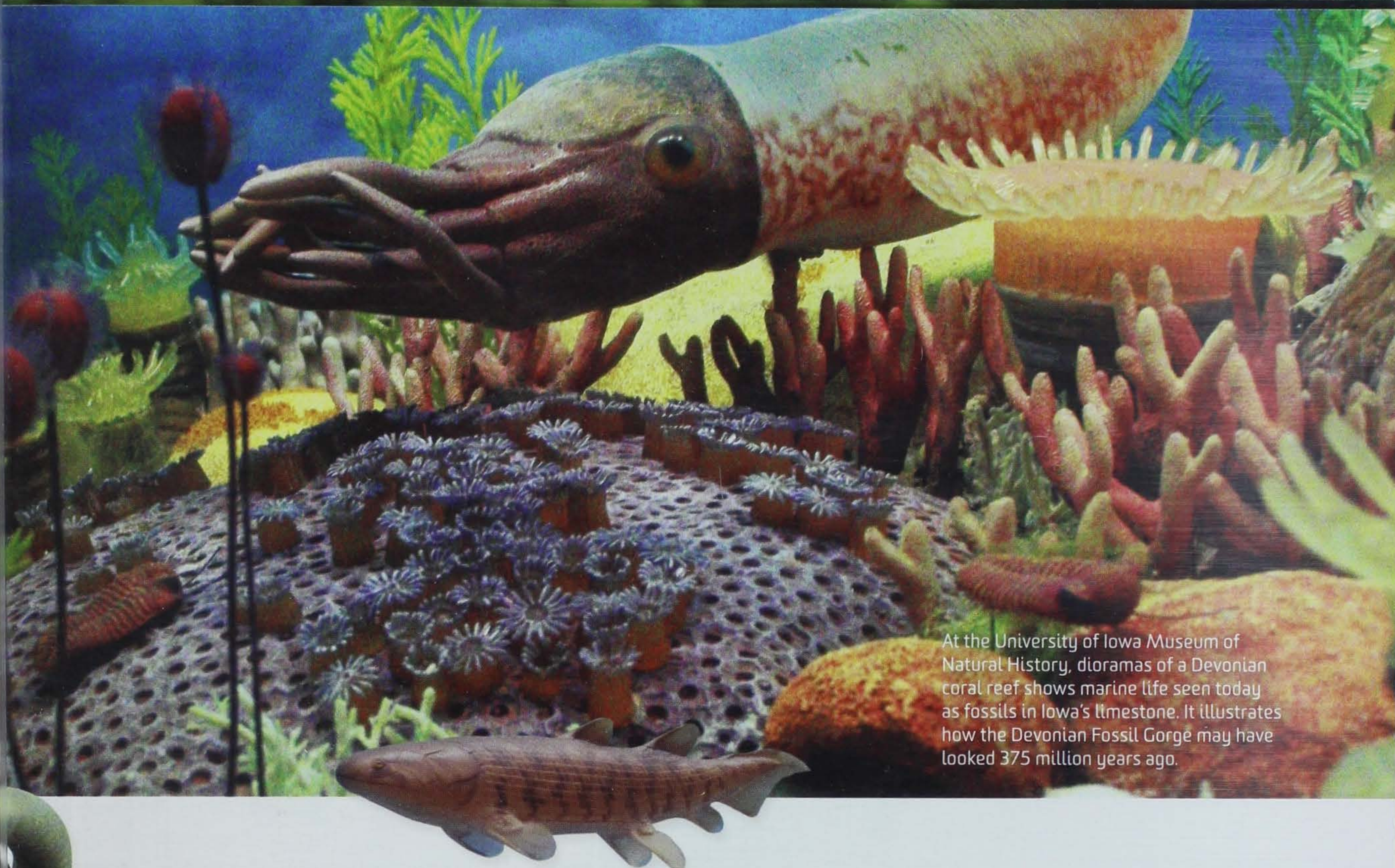
American scientists also took note of the fossil-rich layers, which they believed to be ancient coral reefs. David Dale Owen's reports on the first geological survey of Iowa called attention to the corals, and eventually these landlocked "reefs" caught the attention of the Swiss-born scientist who had seized the reins of American natural history research.

Darwin's Rival Visits Iowa

Just off Interstate 80 at exit 242, the Iowa River Landing area bustles with activity. With its eight-story hotel and conference center, restaurants, museums and newly opened medical office building, it's one of the centers of modern commerce in Coralville. But the historic heart of the town is in a quieter niche a few blocks south, where the Iowa River courses over an old dam. Several mills—a flour mill, a woolen mill, a paper mill—grew up around this dam from the 1840s through the 1860s, and a small settlement grew with them. If you visit the site today, there are no obvious signs of these past enterprises, but there is a restaurant (Iowa River Power, a local landmark) where you can have a meal of steak and shrimp while watching waterfowl play in the surf. In the winter, there's a good chance to catch sight of some bald eagles. A bridge across the river offers scenic views, and at one end of the bridge is a line of plaques



Dunkleosteus grew up to 33 feet long and weighed up to 4 tons. This ancient fish had a bite that exerted 11,000 pounds of force, the strongest bite of any fish ever, and one of the strongest bites of any animal, rivaling T-Rex. The bladed dentition focused the force into a small area, the fang tip, at an incredible force of 80,000 pounds per square inch. It could also open its mouth in one-fiftieth of a second which created a strong suction, pulling fast prey into its mouth. Such speed and strength are rare.



At the University of Iowa Museum of Natural History, dioramas of a Devonian coral reef shows marine life seen today as fossils in Iowa's limestone. It illustrates how the Devonian Fossil Gorge may have looked 375 million years ago.

showing the faces of historical figures important in the development of the town. One plaque shows an inquisitive-looking fellow who looks a bit like a character out of a Charles Dickens novel. "Louis Agassiz," the plaque reads. "Harvard Professor of Zoology...Lectured at University of Iowa on 'Coral Reefs of Iowa City'...Lecture led to the naming of Coralville."

Louis Agassiz is not particularly well known today, at least not compared to his scientific nemesis, a fellow you may have heard of with the last name Darwin. However, there was a time when Agassiz was the most famous, best-loved naturalist in America, if not the world. Agassiz gained widespread attention for his ideas about glaciers; he is widely credited with originating the concept of an Ice Age. He was also a dedicated taxonomist who spent much of his professional life describing and classifying animal species. After coming to America in 1846, he secured a position at Harvard and set about building a world-class museum around his classification system, which, he believed, provided insight into the mind of God. (As he saw it, he was not really categorizing animals himself; rather, he was simply identifying and describing patterns the Creator built into nature.)

According to one of his biographers, Agassiz considered himself the American public's "interpreter of natural history." He earned this title in part by traveling around the country, delivering lectures and involving

himself in research projects. He was slow to reach Iowa—in 1859, the *New York Times* noted Iowa and Texas were the only two states Agassiz hadn't visited—but he would eventually come to work with a number of Iowans on various projects. Aldo Leopold's conservation classic *A Sand County Almanac* mentions an eccentric Burlington resident who busied himself with fossils from the riverbank and later turned out, to everyone's surprise, to be internationally known for this work. Leopold was talking about Charles Wachsmuth, a German immigrant befriended by Agassiz. Together with lawyer and Wapello native Frank Springer (who went on to become a major figure in New Mexico history), Wachsmuth did important work on the crinoid fossils found at Burlington. Agassiz encouraged Springer and Wachsmuth in their studies and eventually purchased Wachsmuth's collection of Burlington crinoids.

Among Agassiz's diverse projects was a study of the modern and fossil coral reefs of Florida. He theorized the entire Florida peninsula was made of several ancient coral reefs and the sediments that had accumulated between them. Based on the very slow rate of modern coral growth, he argued these extensive reefs must have taken an extremely long time to form, and the Earth therefore had to be much older than many people realized. He also thought the physical features of these corals had remained completely unchanged over long



LEFT: Entrance to Devonian Fossil Gorge. **CENTER LEFT:** View from top of spillway at Coralville Lake, looking down to gorge. **LOWER LEFT:** An old quarry face with exposed Cedar Valley Group limestones at the Art Building West on the University of Iowa campus. **BELOW:** Historical plaque near the Iowa River Power Restaurant honors scientist Louis Agassiz.



time spans, and he interpreted this as evidence against evolution. (Evolution was a hot topic in 19th century science even before Darwin proposed a mechanism—natural selection—for biological change.)

From December 1863 to March 1864, in the midst of the Civil War, Agassiz left his work at Harvard and embarked on a lecture tour of the Western states. There were two main drives behind this tour: the need to raise money for his research and his museum, and his desire to speak out against Darwin's ideas, which he regarded as scientifically shoddy and damaging to society. The tour took him to Chicago, St. Louis and other large cities, but also several towns in Iowa, including Dubuque, Davenport and Burlington. Visits from famous scientists were not an everyday occurrence in these cities, and he invariably received a warm reception. The *Dubuque Daily Times* challenged its readers to prove their city's sophistication by attending Agassiz's lectures: "The question is soon to be settled whether the people of Dubuque are capable of appreciating, and are willing to encourage, superior scientific and literary excellence. They will turn out by the ten thousand to the circus to hear a clown repeat stale jokes from an old almanac—how many will be on hand...to listen to LOUIS AGASSIZ, the foremost among living naturalists?"

In Iowa City—no longer the state capitol, but now home to the University of Iowa—Agassiz spent a day traveling along the river with his wife and professor Theodore Parvin, looking at fossils and other geological phenomena in the outcrops and quarries they encountered. He had heard of the local coral fossils even before his visit, so it is likely that he specially requested this trip in order to see them for himself. According to one historian, the 56-year-old Agassiz "ran about just like a little boy under a windfall apple tree," picking up every fossil in sight.

That evening, Agassiz delivered a public lecture in the university chapel. In his talk, "The Coral Reefs of Iowa City," he described the "reefs" and tied them to his theories on the Florida reefs. He argued the Iowa City area had grown out of a primordial ocean in much the same way he thought the Florida peninsula had formed, with sediment filling in gaps between reefs until dry land emerged.

The audience was thrilled with the lecture and with the fact the world's most famous naturalist had taken an interest in their local natural resources. Two years later, coral fossils were discovered at the site of a new mill. The mill was named after the corals, and in short order, so was the village: "Coralville." Newspaper articles announcing the new town do not mention Agassiz, but he probably deserves most of the credit, since he helped many locals understand the fossils as coral remains from an ancient sea and not just unusual patterns in limestone. Who knows? If not for him, Coralville residents might be living in "Millville" or "Marbletown" instead.

Agassiz and his wife Elizabeth, a scholar herself, repeated the Florida coral story often—in lectures, in books, in magazine articles—and after their Iowa visit they usually embellished the Florida tale with a reference to the Iowa reefs. One Johnson County historian claimed Agassiz's visit had made Iowa City world famous, and there may have been an element of truth to this. Elizabeth's coral articles were printed in children's magazines in England, and publications for the Agassiz Association (a society for the study of natural history by young people) still referenced Iowa coral fossils through the end of the 19th century.

Changing Thoughts

Next year marks the sesquicentennial of Agassiz's visit to Johnson County. A lot has changed since he passed through, but much is familiar as well, as the seeds planted in those early days have continued to grow. Coralville has expanded from a small mill town into a city with a diverse economy, and the University of Iowa has become an important center of research on fossil and modern corals. Cedar Valley limestone is still quarried here, and many early operations that yielded "Iowa City marble" now provide scenic backdrops for Iowa City life. Football fans who travel down Riverside Drive on their way to Kinnick Stadium pass by an old quarry face near the Burlington Street dam, and another rises up behind a green pond at the University's Art Building West.

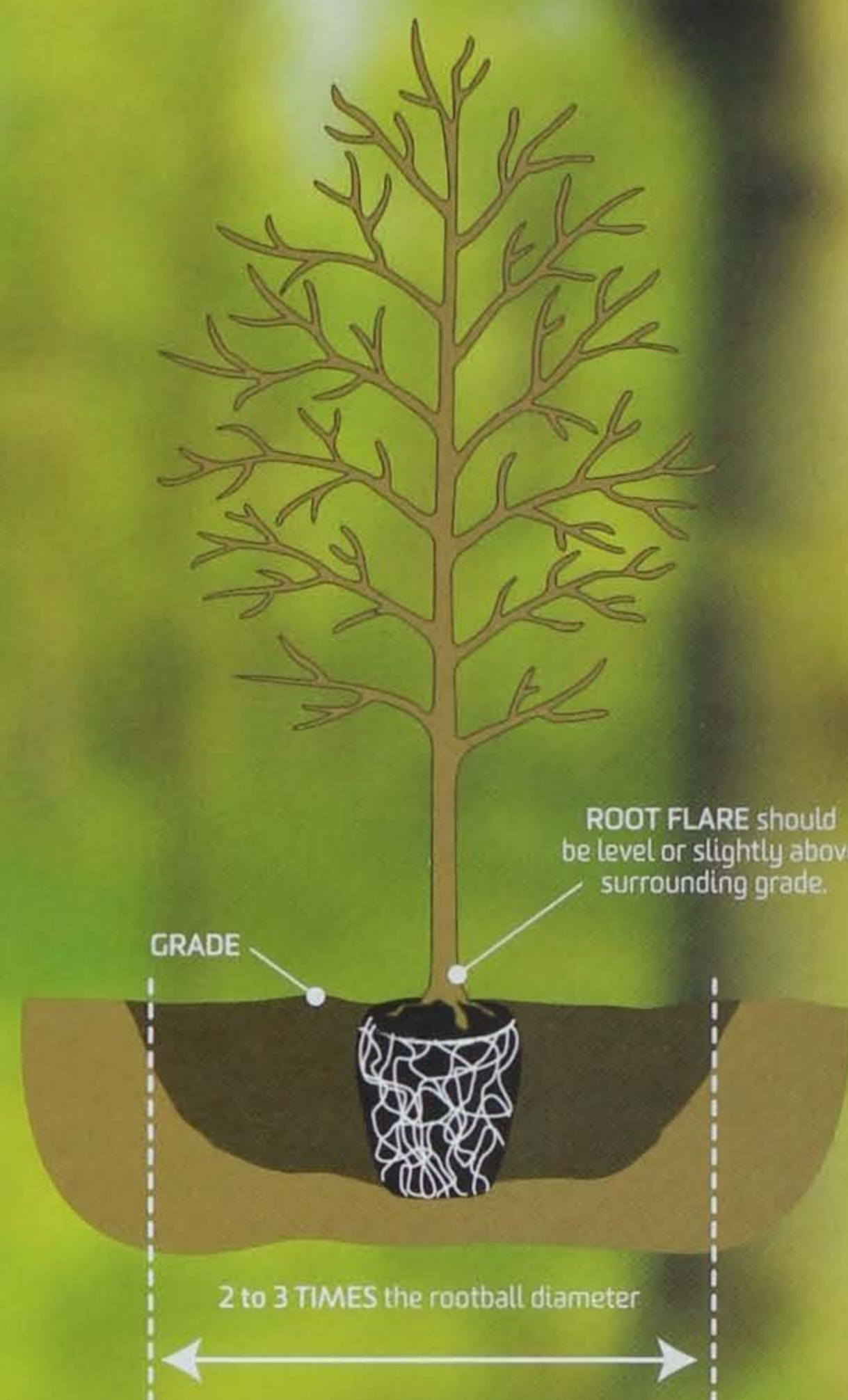
Agassiz is still well known to historians of science, and some of his work endures, but he has become a controversial figure due to his offensive 19th-century views on race. By the time he visited Iowa, his star had already begun to dim as more scholars came to believe Darwin might be onto something; nevertheless, he was still much beloved by the public when he died in 1873. Scientists now understand the Earth is much older than even Agassiz seemed to imagine, and his picture of coastline accretion by coral growth is far too simple in light of what we now know about the complex history of the planet. By 1890, prominent geologist James Dana had written off Agassiz's Florida coral idea as "myth," since Agassiz didn't account for the rise and fall of sea levels.

Even the Devonian Fossil Gorge has changed. In 2008, water from another spillway breach thundered through the gorge. This time the damage was relatively minimal. The sidewalk down from the entry plaza was damaged, but the exhibits were set well above the floodwaters and remained intact. Most of the numbered fossil markers placed on the bedrock were swept away in the torrent, but they have been replaced. Even if any severe damage is caused by future flooding, it may simply unearth a new layer of previously unseen fossils. At Coralville Lake, Iowa history—from the deep past to the birth and childhood of Johnson County—will not stay buried. 🐻

(This essay is based on a longer article that appeared in *Earth Sciences History*, Volume 31, 2012, p. 193-209.)

TIPS TO AVOID THE TOP TREE KILLERS »»

Simple Ways to
Do Right for Your Trees



Trees add beauty, increase property value, clean the air, provide shade and create habitat. Get the most from your leafy wonders with these simple steps to ensure your trees avert an early demise.

Mower Blight

Bumping a young tree with a mower, hitting it with a weed trimmer or tying a dog chain to the trunk takes a toll. "There is living tissue right under the bark," says DNR forester Matt Brewer. Bumps and nicks create a compartmentalized wound unable to carry water and nutrients and leads to decay. Prevent damage by extending mulched areas farther from the trunk into the drip line—the area where water drips off the farthest leaf. Doing so keeps mowers at bay. "Don't value your lawn more than your trees," says DNR forester Laura Wagner.

Watering Issues

New trees often don't get enough water. "People water after planting, then forget the tree for a month," says Brewer. How much water is enough? First, lawn sprinklers and irrigators are not adequate for trees—the superficial watering leads to shallow roots. Older advice called for watering 20 minutes a week using a slow hose drip—about 10 gallons. New recommendations from Iowa State University up the frequency. For new trees, water once to

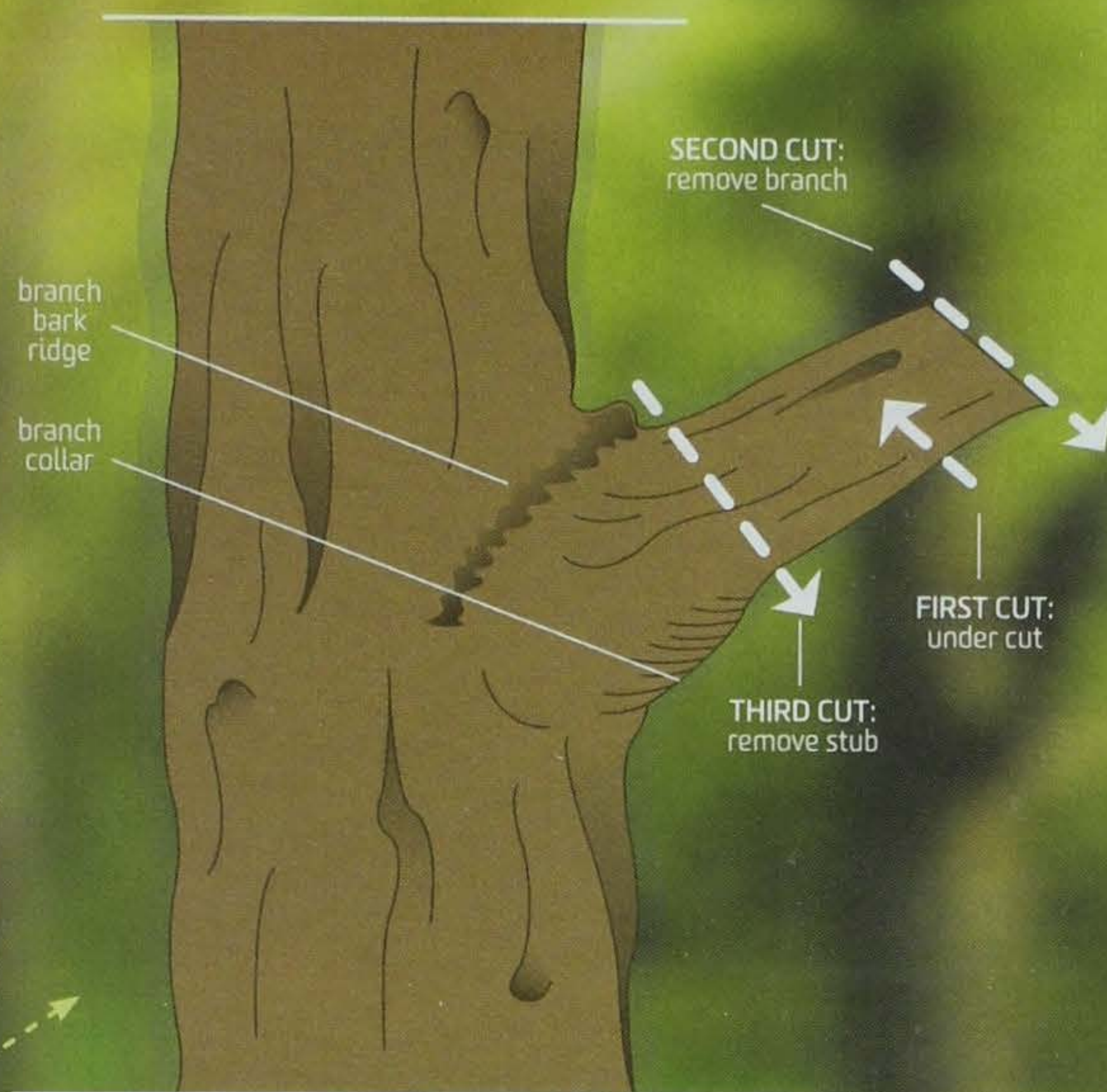
three times weekly directly above the root ball. Use 2 gallons for every inch of trunk diameter (measured 6 inches off the ground). Use a 5-gallon bucket with a small hole in the bottom. During wet years, be careful as keeping a root ball saturated can cause root decay.

Planting Too Deep

More than half the residential trees in the nation are planted too deep, say Wagner. This includes trees planted by nursery staff and landscapers. Planting too deep causes early mortality—for example, a tree may survive 25 years, but not reach its 100-plus-year natural lifespan. If set too deep, trunks grow new, weak roots off the stem which can encircle and choke and promote rot and decay. It also creates a weak spot—susceptible to wind throw—where the trunk breaks above ground in high wind. When planting, ensure the natural taper or root flare at the base of the trunk is slightly above ground.

Roots That Choke

As roots grow in diameter, any circling roots will act like a noose—cutting off water, nutrients and encouraging rot and decay. A tree with circling roots is weak and more susceptible to falling in high winds. Before planting, examine the root ball and prune or straighten any encircling roots.



Pruning Issues

Every cut to a tree is an injury—so prune with purpose. Trees need branches and leaves to store and produce food, so only remove what really must go. Cut to the branch collar, not flush to the limb or trunk to encourage proper scar tissue formation. For branches greater than 1-inch diameter, use the three-cut method. Don't prune a tree the first two years after planting.

Tree Topping

Removing tree tops is harmful, expensive, promotes sucker growth and makes a tree potentially hazardous. People choose to top a tree believing the tree is too large and they remove a large percentage of branches and limbs. Any company that proposes tree topping should be avoided.

Tree Selection

Plant the right site with the right species with a healthy tree. Ensure the species you select will not be too large for the site. Take into account overhead obstructions such as power lines and hard surfaces such as roads, sidewalks and driveways that prevent roots from obtaining moisture and oxygen. Envision the tree at maturity and the proximity to homes. Consider its sunlight needs, shade tolerance, growth rate and other factors.

Soil Changes

Adding decorative retaining walls or deep flower beds around trees can cause harm. Changes to grade such as adding or removing soil can impact trees years later. That seemingly invincible mature bur oak will die quickly after a grade change. Since trees don't like changes, avoid or minimize landscape alterations. Construction activity is particularly

hard on trees. Minimize digging to lessen cutting and tearing of roots. Heavy equipment traffic under drip lines should be avoided to prevent soil compaction.

Volcano Mulching

Piling a thick cone of mulch up against a trunk is a top tree-killing practice, says DNR urban forester Emma Bruemmer. Doing so keeps the trunk overly moist—leading to rot and decay. Dodge this tree destroyer by keeping mulch away from the trunk. Think “donut shape” with a mulch-free area a few inches from the trunk. Extend mulch far from the trunk to maintain moisture, prevent weeds and regulate ground temperature over more area. Use a 3-inch deep layer of wood chips. Don't mulch with grass clippings—they compress and mat together to restrict water and oxygen availability—mix grass in with the compost pile instead.

Ties that Bind

Objects such as stakes, tags, wire and rope cause harm if not removed. Most healthy trees do not require staking if they have a good root ball. Larger bare root trees do require staking.

RESOURCES TO LEARN MORE

- Three new DNR online videos explain tree selection, planting depth and mulching. [Youtube.com/iowadnr](https://www.youtube.com/iowadnr)
- A one-stop shop for everything tree-related. www.extension.iastate.edu/forestry
- U.S. Forest Service tree owner's manual. <http://na.fs.fed.us/urban/treeownersmanual/>
- U.S. Forest Service urban and community tree website. www.fs.fed.us/ucf/

Wild Cuisine KITCHENSIDE

BY ALAN FOSTER AND BRIAN BUTTON



Italian Dandelion with Garlic and Oil

Rich in vitamins A, B, C and D, dandelion leaves also provide minerals such as iron, potassium and zinc. Spring is excellent for harvesting leaves before the plant blooms and the leaves become somewhat bitter, which boiling in salt water helps remove.

While a safe, nutritious food, some people with allergies to ragweed, marigolds and daisies should avoid dandelions due to risk of allergic reactions. Those with gallbladder problems and gallstones should talk to their doctors before eating dandelions. In addition, dandelions may interact with some prescription medications such as lithium, quinolone antibiotics and antacids.

From The Silver Spoon, Italy's number one cookbook for more than 60 years.

2 1/4 lbs. washed dandelion leaves
cut into strips
Extra virgin olive oil
4 whole garlic cloves, peeled
Pinch chili powder (optional)
Salt and pepper

Cook leaves in salted boiling water for 15 minutes. Drain and squeeze out liquid. Heat oil in skillet, add garlic cloves and cook over low until golden brown. Remove and discard garlic.

Add leaves, increase heat and cook 15 minutes. Stir occasionally. Season to taste.

Pickled Fish

Pickled fish has been a staple and a delicacy across Europe for centuries, serving as an easy way to preserve and transport fish. Give this easy recipe a try when looking for a tart treat.

PICKLED FISH

3 pounds fish filets
(bluegill, crappie, pike, etc.)
3/4 cup canning salt
White vinegar

SPICE MIX

3/4 cup sugar
1 tablespoon pickling spice
3/4 cup dry white wine
3/4 cup water

PICKLING MIX

1 1/3 cup white vinegar
One onion, cut into rings
Garlic (optional)
Hot peppers (optional)

Freeze fish three to four days to destroy any parasites. Cut filets into bite-size pieces. Cover with vinegar and salt in a non-metallic bowl. Cover and store in refrigerator for five to seven days, stirring every day. After seven days, drain, rinse and cover with fresh water and let stand eight hours. Combine spice mix in a pan and bring to a boil. Remove from heat and cool to room temperature. Combine spice and pickling mix. Add drained fish and store in a covered, non-metallic container. Refrigerate for 48 hours to allow flavors to mix.

Recipe from the Iowa Warden's Cookbook first edition, courtesy Officer Mike Bonser. To order a copy of the second edition (\$15, plus \$5 S&H), contact your local conservation officer or officer Deb Howe at 712-520-0507.



Admiration & Legacy

BY JESSIE ROLPH BROWN



CALL IN THE GUARD

IOWA ARMY NATIONAL GUARD

Soldiers take on park projects

Service is at the heart of the Iowa Army National Guard, and every April, its soldiers put a focus on the environment. While the "Guard the Environment" volunteer project began five years ago as a trash cleanup, it grew last year. "You collect garbage and that might benefit for only a day. We wanted something tangible that future soldiers could see benefitted the community and state and that they could show to their

friends," says Captain George Mosby. So 120 new Guard members volunteered at two state parks. One group pulled 1,000 pounds of invasive garlic mustard from the Neal Smith Trail in Big Creek State Park. Another group headed to Ledges State Park to repair a quarter-mile stretch of eroding trail. Using buckets and a wheelbarrow, the soldiers spread 26 tons of crushed rock to resurface the trail. "The project these volunteers accomplished was beyond expectation," says Andy Bartlett, park manager at Ledges. "To spread 26 tons of rock—by hand—was an extraordinary feat, especially in that short time. This project would not have been completed without their help." Park visitors passing by offered thanks—and projects like this help prepare soldiers for future efforts, like disaster relief or deployment, Mosby says. "There's no better feeling than being able to serve," he adds. "I want them to get a taste of that."

LANDFILL MAKEOVER

CRAWFORD COUNTY PHEASANTS FOREVER

Local chapter wins national grant to turn closed landfill into public area

It made no sense that the old county landfill should be a wasteland—at least to the Crawford County chapter of Pheasants Forever. The landfill left 145 acres of open space when it closed in 2007, keeping only a transfer station and recycling center. To the chapter, which had planted trees there for 20 years, the space was a natural for wildlife habitat, mowed walking trails and more. The idea sprang during a conversation about needing more local habitat when the chapter hosted the 2011 Governor's Pheasant Hunt. The chapter met with the landfill board and the DNR, but they needed funding. Enter the SportDOG Conservation Fund, which awarded the group \$25,000 following a nationwide vote. That will allow the group to plant 1,000 trees and shrubs, add prairie plantings, bluebird houses and more. The 150-member chapter is applying for more grants to build an outdoor classroom. "We need to make property available to carry on the heritage to the next generation. Our chapter is all about kids," says K.R. Buck. "We knew this land would never be sold, so why not turn it into public use?" Closed landfills present a unique opportunity for wildlife and outdoor recreation, says the DNR's Alex Moon. "Most are publicly owned and aren't likely candidates for development. They often consist of many acres of undisturbed buffer grounds so they naturally draw wildlife."



KEEPING IT CONNECTED

SPIRIT LAKE MIDDLE SCHOOL

Sixth graders revive birdwatching sanctuary

Study nature, and you'll find how connected its parts are—a concept that science, math, art and writing classes at Spirit Lake Middle School learn first-hand. Looking for a community project for his sixth grade science students, Jason Schneider asked Dickinson County Conservation naturalist Barb Tagami for ideas, and the Tom Grein Audubon Sanctuary quickly came to mind. Overgrown, the in-town sanctuary created in the 1970s had fallen into disrepair. Now, students visit monthly to pull invasive plants, identify plants, conduct population studies, install birdhouses and take photos for the website they're building. Back in the classroom, art classes work on educational kiosks and English students create visitor brochures on animals and birds. Math classes analyze biodiversity data to determine if invasive plants are taking over. "All different disciplines were brought together with this project. It gives a child a whole picture," says Tagami. The community jumped in, helping students remove invasive trees and plants. The city and Dickinson County Conservation Board agreed to take on maintenance. "Our kids love it. It's a great chance for them to go outdoors. They take pride in what they're doing," says Schneider. The Northern Iowa Prairie Lakes Audubon Society helped fund the kids' projects, and the

restoration pleases Audubon member Leah Streeter. "It's a cooperative venture that will be very nice. It's what LaVonne's vision for it was," Streeter says, referring to longtime Audubon member and benefactor LaVonne Foote, who wanted to see the sanctuary maintained. With last year's students still involved, Schneider hopes the project spreads through the whole school into the future. "It's really made kids aware of things we can do to help," he says.

Warden's Diary

BY ERIKA BILLERBECK PHOTOS BY KATI BAINTER



Difficult Memories

Nobody has ever accused me of having a photographic memory. I frequently (OK, daily) misplace items such as coats, keys, shoes, purses, phones and every now and then, a kid or dog. Every time I climb into my truck to go to work I sit in the driveway for a few moments taking a mental inventory, only to slink back into the house, murmur to my husband, "I forgot my _____," and watch him roll his eyes. He is in awe of my ineptitude.

Sometimes it seems memories come with varying adhesive strengths. Some hold about as well as a sticky note. A light breeze will send it fluttering away. Others are equipped with stronger glue, like good childhood memories. These memories can be recalled, but they may not be entirely accurate. It is as though my brain is a file cabinet stuffed with unorganized Polaroids.

Then there are industrial strength memories. They seem to be welded into place. They are filled with details. Good ones, like holding my children for the first time, or watching them take their first steps. Other details won't budge, even if I want them to. I'm sure



everyone has a stash of these memories. They are especially strong for people who have experienced a tragedy or been through something extraordinary, like war. And every law enforcement officer, firefighter, first responder and EMT will eventually find him or herself with a detail they just can't shake.

I can conjure details of a particular steamy, summer afternoon I worked on boat patrol years ago as if it happened yesterday. The memories are in the details.

It was a day that a young girl was killed on the lake, and the summer officers and I were first to arrive on the scene. The girl had fallen into the water while tubing and was struck by a boat.

The first detail shows my patrol vessel approaching a boat with what appears to be an injured person lying on the stern of the boat. She is partially covered in towels and I see blood. I yell to the boat occupants and tell them to apply pressure to the wound. There is a man seated at the back of the boat, next to the injured girl, and he is shaking his head at me. He is shaking his head "No." But

I continue to instruct them to apply pressure. Why aren't they trying to stop the bleeding?

In the next image, the man in the back of the boat makes a gesture with his hand. He is telling me something, but I don't comprehend what he's trying to say. It isn't until we finally reach the boat and he lifts the towel off the body that I understand. Applying pressure will do no good. Too many details.

Some people assume that cops have seen everything. Our skin is thick with experience. But there is a first time for everything, and I had never seen anything like this before—not with anyone, and especially not with a child.

In the third detail, I turn away from the body and take a breath. I feel sick and have to concentrate. It is too sad for my stomach to bear. My first instinct is to rush home, and hold my daughter close to me. I desperately want to know that she is safe.

In the fourth snapshot, I realize that I can't go home because everyone is looking to me to do something. I happen to be the one in charge of this situation. So, despite the urge to retch, I don some thick skin and begin the investigation.

A couple days after the incident, my supervisor called in an officer trained in "critical incident stress debriefing" to meet with me and the summer officers. I met with him alone in a parking lot near my home, and within five minutes of listening to reassurance that what I was feeling was normal, I found myself in tears. I cried because it was a tragedy. I cried for the little girl's parents, for her mother. I cried because I had a horrible tendency to mentally substitute my own children for the victim whenever I closed my eyes. And I cried because I was hungry and tired and I couldn't stop thinking about it. There were too many details to sort through.

It took awhile before I was able to make it through a day without randomly bursting into tears. My thoughts were like dominoes. If I thought about one thing, it all came flooding back. Because I was in the midst of investigating the accident, I had to interview many people and every story was full of details. Sometimes other things would trigger memories. One day about a week after the incident, my hairdresser gave my daughter a head model so she could practice "doing" the hair. I couldn't look at the model without feeling like I was going to be sick. Sometimes I know too much—the victim and her friend were singing a song on the tube before she fell, and every time I hear the song I think about her.

Though I don't wish to repeat this experience, I know it has made me a better officer. There is little I take more seriously than boating safety and law enforcement on the water. I'm better off now knowing how I will

handle that kind of stress. And now I don't doubt that other officers will step in to help out when the going gets rough.

The 12 years that I've been in law enforcement have caused me to be a hyper-vigilant parent. Perhaps the biggest challenge is squelching the urge to buy a giant roll of bubble wrap to drape around my kids. I want to buffer them against the world, and keep them next to me where I can watch over them.

But no matter how safe it would be in bubble wrap, it wouldn't be what life is supposed to be about. Instead I hope my children continue to live fully and make sticky memories. I hope they learn that life is all about the details. 🐻



Daddy Longlegs, *Arachnida opiliones*

Although a member of the arachnid family, one of the most common and creepy-looking spiders—daddy longlegs—isn't a spider at all. They are harvestmen, and despite urban myth, they are not the most venomous animal in the world, yet possess fangs too short to bite.

YOU CAN'T MISS ME

Daddy longlegs are recognized by their long, thin legs and singular body. They do not spin silk. Their abdomen and cephalothorax are one unit, unlike true spiders. And instead of having eight eyes like spiders, they only have two.

IT'S ALL IN THE NAME

Daddy longlegs are often seen in great numbers in the fall around harvest time, hence the name "harvestmen."

DEFENSE

Harvestmen have eight legs, two of which double as antennae. When threatened, they can detach their legs, which "twitch" for a short time afterwards. Some theorize that distracts predators to aid escape. Some species have scent glands that secrete a peculiar smelling fluid when disturbed. Others may "glue" debris to their bodies for disguise.

EGGXACTLY

Worldwide there are more than 6,500 species of harvestmen. Rare in the animal world, the male is often responsible for guarding eggs against egg-eating females. Even rarer, these eggs are from multiple partners. Males regularly clean the eggs, too.

GRANDADDY

Harvestmen are very old arachnids, with fossils from the Devonian Rhynie chert some 410 million years ago proving they lived on land since that time. Fossils found 165 million years ago in China were hardly discernible from their modern day descendants.

WHAT'S FOR DINNER

Daddy longlegs are omnivorous, eating primarily small insects and all kinds of plant material and fungi. They also feed on decomposing plant and animal matter. They can eat chunks of food and are not restricted to liquids like other arachnids.



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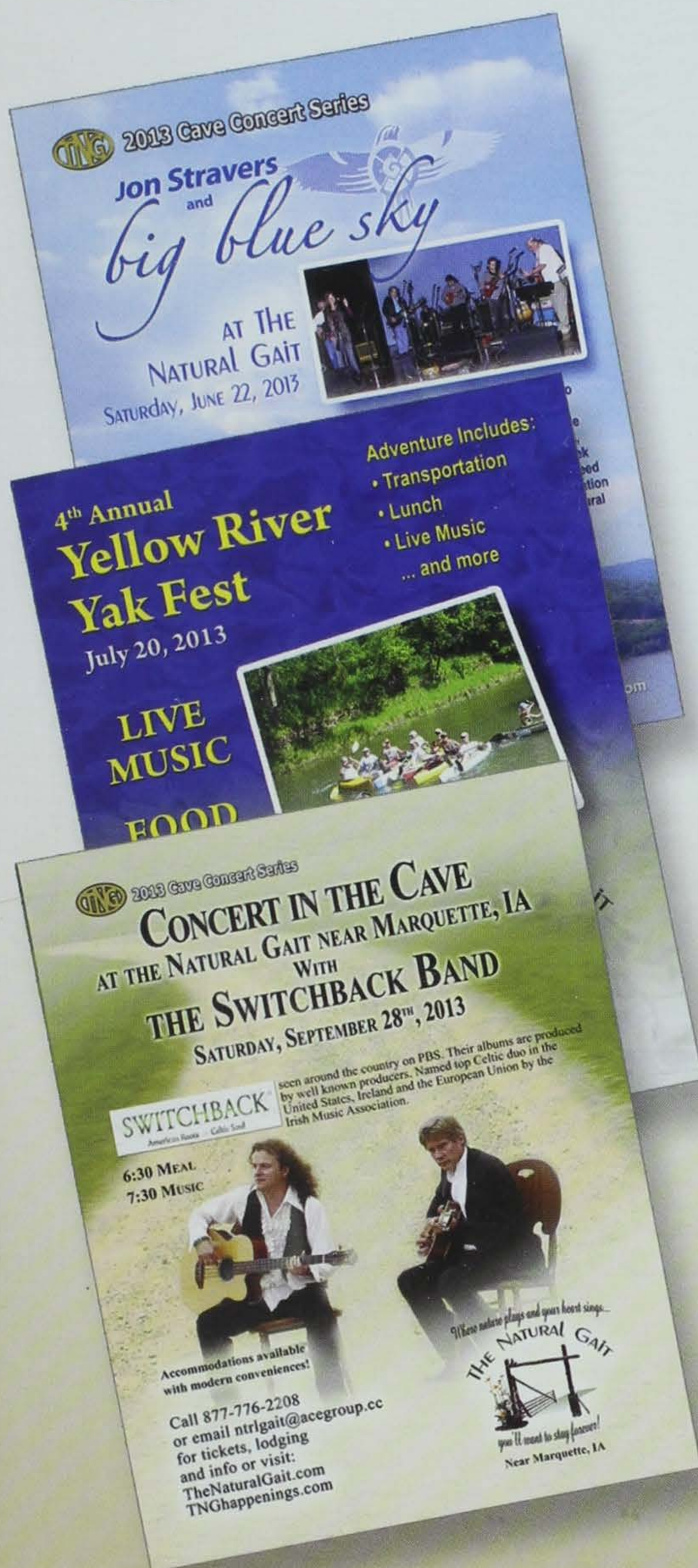
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