



Wisconsin natural resources. Vol. 31, No. 5 October 2007

[Madison, Wisconsin]: Wisconsin Department of Natural Resources, October 2007

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A person is rappelling down a dark, craggy rock face. They are wearing a dark jacket, pants, and a headlamp that is turned on, illuminating the rock around them. The person is positioned in the center-left of the frame, with their body angled towards the right. The background is a mix of dark and light rock textures, with some areas appearing to be wet or reflective. The overall mood is adventurous and exploratory.

WISCONSIN NATURAL RESOURCES

www.wnrmag.com
October 2007 \$3.50

The world down under

The century run —
a tale of a birding tally

Biting down on deer damage

Trim down paunchy pets

Big puffball mushrooms are tasty when they are young and still pure white, but be careful as small ones look like some highly poisonous species. Cut into the mushroom. The edible species should have no stalk or stem, no brown discoloration, no signs of a stem or gills and should have a soft but dry interior with no signs of moisture, slime or spores.

Smoke from a bald giant

This massive fungi is a creamy puffball but not a pushover.

Anita Carpenter

A co-worker unceremoniously placed the medium-sized cardboard box before me.

"Have you ever seen anything like this?"

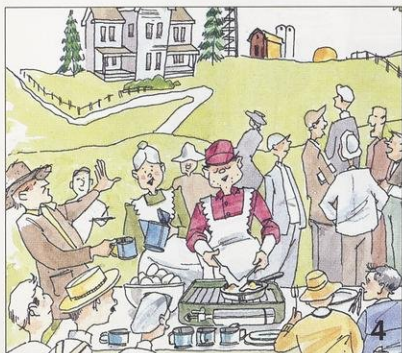
I carefully opened the box to find the largest mushroom I had ever seen. It was the size of a volleyball, pearly white and positively dwarfed the walnut-sized puffballs that were more familiar to me. All I could exclaim was "Wow! This is cool!" Then my naturalist's curiosity took over.

I just had to measure this giant. The puffball was a somewhat flattened oval, not a perfect sphere. It measured seven inches high, 22 inches around from top to bottom with a circumference at the widest point of 32 inches. The specimen weighed in at a hefty two pounds eleven ounces. With no evidence of spines or small hairs, the surface was as soft and smooth to the touch as kid gloves. On the bottom, the behemoth had a cord-like root where it must have attached to the mycelium.

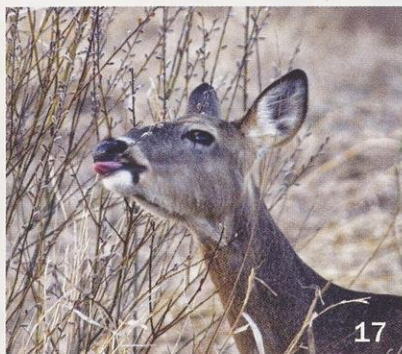
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October 2007
Volume 31, Number 5



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FRONT COVER: Henry Welch rappels through a sunbeam into Dave's Sink, a cave at the Ledge View Nature Center in Chilton. Welch, fellow members of the Wisconsin Speleological Society, and other volunteers helped remove tons of sediments from the caves at Ledge View over the years to unearth the beauty and opportunity to explore these underground caverns.

JENNIFER SCHEHR, Dodgeville

BACK COVER: Battle Bluff State Natural Area in Vernon County. For more information, or to order a guidebook to State Natural Areas, contact the State Natural Areas Program, Bureau of Endangered Resources, DNR, P.O. Box 7921, Madison, WI 53707 or visit dnr.wi.gov/org/land/er/sna.

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Wisconsin Natural Resources magazine (USPS #34625000) is published bimonthly in February, April, June, August, October and December by the Wisconsin Department of Natural Resources, 101 S. Webster St., Madison, WI 53702. The magazine is sustained through paid subscriptions. No tax money or license fees are used. Preferred Periodicals postage paid at Madison, WI. POSTMASTER and readers: subscription questions and address changes should be sent to Wisconsin Natural Resources magazine, P.O. Box 7191, Madison, WI 53707. Subscription rates are: \$8.97 for one year, \$15.97 for two years, \$21.97 for three years. Toll-free subscription inquiries will be answered at 1-800-678-9472.

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Printed in the U.S.A. on recycled paper using soy-based inks in the interest of our readers and our philosophy to foster stronger recycling markets in Wisconsin.

Governor Jim Doyle

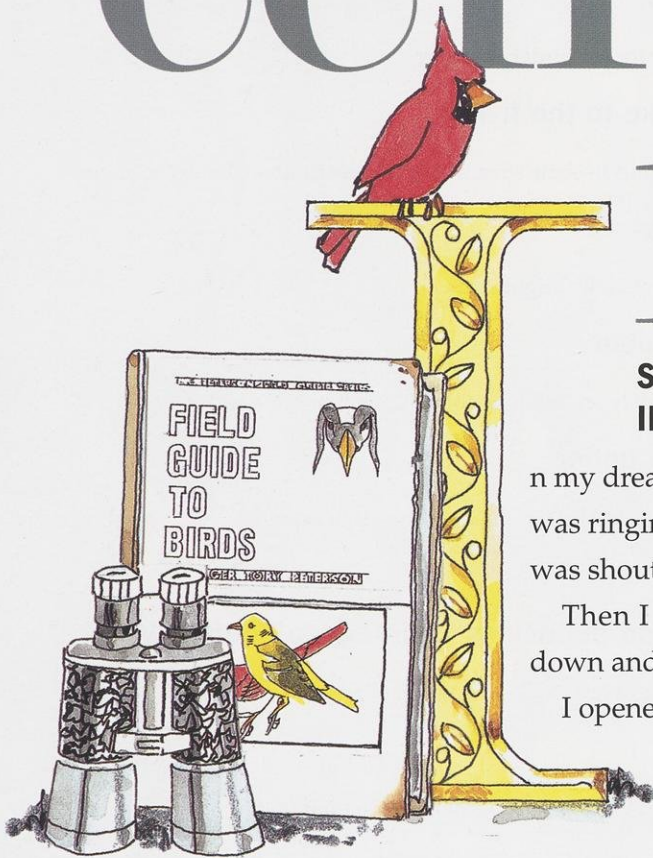
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PUBL CE-012
ISSN-0736-2277

The century run



Story by Dave Crehore

Illustrations by Tom Lowes

In my dream I was in the belfry of a church steeple. The bell was ringing, and from the bottom of a long ladder, someone was shouting my name.

Then I woke up. My windup alarm clock was winding down and Dad was calling me from the foot of the stairs.

I opened my eyes and shut the alarm off. It was 3:30 in the morning. I put on jeans and a wool shirt, laced up my boots, hung binoculars around my neck and stuffed my copy of "A Field Guide to the Birds" into a back pocket. It was the first Saturday in May,

1953. I was 11 years old, and Dad and I were going all out to win the father-and-son division of the Bird Breakfast birding contest.

I'm not sure when Manitowoc's Bird Breakfast got started, but in the early fifties it was a minor cultural institution, sponsored by St. Paul's Methodist Church. For a couple of years it was held at our house just outside the city limits. I don't know why we were chosen to host the event, but I suspect it was because we belonged to the church and had two bathrooms.



The procedure was to arrive at dawn, eat an outdoor breakfast cooked on a Coleman stove, and then go birding. The competitors listed the species they saw, and those who had the most birds by noon won modest prizes. Scoring was on the honor system, so beginning birders who said they saw fulvous tree-ducks or painted buntings got to count them. Some participants did not go birding at all, but instead hung around Dad and his big cast iron skillet, eating bacon and eggs and drinking coffee. "My God, Dave, that makes three eggs I've had," a man would say, and Dad would reply, "Five, but who's counting?"

This year, though, Dad was leaving the cooking to Mom. This year, I was old enough to do some fairly serious birding. Dad and I were going to skip breakfast, start out in total darkness, drive briskly from one hot spot to another, and rack up sixty or seventy species. This year, we were going to win.

Mom, Dad and I had no particular interest in birds until we moved from Ohio to Manitowoc in 1950. But when we bought our house on River Road, we acquired Merle Pickett and Lillian Marsh as neighbors, and they were master birders: experts, sharks. They knew habitats, field marks and songs, and shared their knowledge with everyone.

Under their guidance we became birders as well. Not masters, of course, but devoted apprentices. And now, with three years of bird-chasing under our belts, Dad and I were serious contenders for the father-and-son title.

Down in the kitchen, Dad poured me a half-cup of coffee and slapped butter on toast. "Eat quick, and let's get going," he said. "We've got a lot of miles to drive."

Dad planned our day as we finished our coffee. "First stop is the thrush woods," he said. "We should get two or three thrushes and a couple of owls, if we're lucky. Then we'll drive out to Collins for puddle ducks and shorebirds. After that we'll come back here and check out Rahr's farm. Then the cemetery, Lincoln Park and the Little Manitowoc, if we can squeeze it all in."

Nip and Jeff, our beagles, yawned and stretched and kept an eye on us.



They knew something was up and wanted to be included. Dad reached down and patted Jeff's head. "No, we aren't going rabbit hunting and you aren't coming along," he said. "But don't feel bad, boys — in a couple of hours there'll be a hundred people here, and all the leftovers you can eat."

Outside, we paused for a moment in front of the garage. The moon was down, it was pitch dark and there wasn't a breath of wind. From the black sky overhead we heard the faint chipping calls of migrating songbirds. We weren't skillful enough to identify them, but birds were clearly on the move.

Dad raised the garage door. It made its usual screech and was answered by the rasping crow of a cock pheasant somewhere down in the wooded ravine

that ran along the east side of our yard. "How about that!" Dad said. "Species number one and we haven't even started the car. Maybe it's an omen."

On our way to the thrush woods, Dad turned on the overhead light in our Studebaker station wagon. He took a folded bird list from his field guide. "You can be the accountant today," he said, handing me the list. I ran the point of my pencil past the loons and ducks and geese until I came to "ring-necked pheasant" and made a small, careful check. "That's one," I said.

The thrush woods was our name for a woodlot about 10 miles west of town. It was split down the middle by a gravel road. We stopped part-way through. Dad opened the Studie's tailgate and we sat on it while he poured some cof-



eight times in a jazzy rhythm.

There was an immediate, loud reply from a tree almost overhead: *Hoo hoo hoo-hoo, hoo hoo, hoo hoo-aw!*

We tried to spot the owl, but it was too dark. "You try it, Davy," Dad said. I hooted, and got a similar answer. The branches of the trees were now faintly silhouetted against the sky, but the owl was still invisible. "Anyway, it's a barred owl," Dad said. "That was worth the price of admission." I checked it off. So far we had three species without seeing a thing.

Dad and I sat on the tailgate for another 10 minutes, drinking coffee and listening. The thrushes started in shortly after the owls knocked off, and for a while we were serenaded by a veery and a wood thrush singing simultaneously from opposite sides of the road.

"Some day," Dad said, "you'll be reading a book and come across the word 'ethereal.' It means heavenly, and it's the best word for the song of the wood thrush." I glanced up at Dad; I had never heard him say anything like that.

He looked at me and winked. "And maybe for Audrey Hepburn," he said. "She's pretty *ethereal*."

By this time it was light enough to walk into the woods. We saw hermit and olive-backed thrushes, a brown thrasher, a flicker and a yellow-bellied sapsucker. Birds were singing all around us. Dad peered through the underbrush. "There's a fallen log over there — let's sit on it for a minute and listen." But when we got within 30 feet of the log, it seemed to explode. There was a thunder of wings and a shower of leaves as a large bird rocketed into the air and disappeared.

"Grouse," Dad said. "We must have jumped him off his drumming log." We headed back to the car. On the way we passed through a small clearing and I flushed a chubby, long-billed bird that ran erratically ahead of us and then twittered into the air. "Woodcock," Dad said.

Back at the car, Dad looked at his watch. "Five-thirty. We've got to hit the road for Collins. The sun will be up soon."

I opened the door of the Studie and took a last look around. On a lower branch of a big oak I saw a small, white-bellied bird with an eye ring and a long tail. Dad saw it too, studied it with his binoculars, and flipped through his field guide. "Blue-gray gnatcatcher," he said. "Page 163."

On the way to Collins Marsh, I checked off the birds we had seen or heard at the thrush woods. We were up to 13.

The marsh was a low-lying area along the Manitowoc River, near the little town of Collins. In wet years, it provided a temporary stopping place for migrating waterfowl and shorebirds.

Dad turned down a side road and stopped beside a flooded cornfield that was covered with ducks. He started identifying them and pointing them out to me as I made checks on our list. We saw nine species of ducks, a horned grebe, a hooded merganser, a marsh hawk tilting low over the field, Forster's and black terns, an eastern kingbird and a yellow warbler. Through the shimmer and glare we thought we could see shorebirds on the far side of the cornfield, but they were too far away to identify with our seven-power binoculars.

"Shoot!" Dad said. "I was counting on getting some shorebirds at this spot. We could walk out there, but there's no cover and we'd just scare them away." I counted up my check marks. "That makes 29," I said.

Out on the highway, Dad gunned the Studie up through the gears and leveled off at about 50. Then I saw some puddles in a grassy field just ahead. Dozens of small, long-legged birds were wading in the puddles.

"Shorebirds!" I yelled, and Dad stamped on the brakes. From behind us came the squealing of tires from a much larger car. It slid to a stop a few feet from our bumper. I looked back and saw the toothy grille of a Nash Ambassador. The car was painted an ominous black and white; it was a state trooper. "Oh, Lord," Dad said, and pulled over onto the shoulder.

fee from the thermos and lit his pipe. We waited through five minutes of unbroken silence.

"Come on, owls," Dad whispered. He tapped his pipe on his palm, dislodging a small shower of glowing red embers onto the gravel. Then, at a considerable distance, we heard the first owl of the morning. *Hoo, hoo-hoo, hoo, hoo*, it said, in a five-note pattern I had heard once before. Dad struck a match so I could see the list, and I checked off the great horned owl. "That's two," Dad said. "Heard birds count, if you're really sure what they are."

There was a hint of gray in the east. Dad cupped his hands around his mouth. "I wonder if this will produce anything," he said. "I've never tried it, but I've heard that it works." He hooted

The trooper got out of his cruiser, straightened his flat-brimmed campaign hat and walked slowly up to Dad's side of the car, carrying a leather citation book.

"What did you stop for?" the trooper said. "It's lucky I was paying attention or I would have run you over!"

"Well, officer, we saw those birds over there," Dad said, pointing. The trooper looked over the top of our car at the puddles.

"So there's birds," he said. "So what?"

Dad smiled ingratiatingly. "We're in a contest — a birdwatching contest."

"I never heard of a birdwatching contest," the trooper said, suspiciously. "Who's putting it on?"

"St. Paul's Methodist Church in Manitowoc," Dad said. "Oh," said the trooper. He didn't seem impressed. He was a big, beefy blond fellow, probably a Lutheran or Dutch Reformed.

"So what kind of birds do you see over there?" the trooper asked. "Let me look," Dad said, lifting his binoculars. "Well, right in front of us is a Wilson's snipe, and behind him is a flock of dunlins, and then just to the left is a semipalmated plover and a pectoral sandpiper. Then there's a solitary sandpiper, and behind it is a little flock of yellowlegs."

Dad rattled on nervously. "Actually there are two kinds of yellowlegs, greater and lesser, but I can't tell which they are at this distance. I think that's pretty much all — except, wait — yes, those little reddish birds drilling in the mud are dowitchers. There's two kinds of them, too — long-billed and short-billed, but they are really hard to tell apart if you can't hear them call...."

"OK, OK, I believe you," the trooper said, beginning to smile. "Tell you what, sir — when I got out of my car I was all set to write you a ticket for reck-

less driving. But you two have made my day. I can't wait for the shift change, so I can tell the other guys about those short-legged doohickies," he said, laughing. "In the meantime, you Methodists keep an eye on your mirrors — something might be gaining on you."

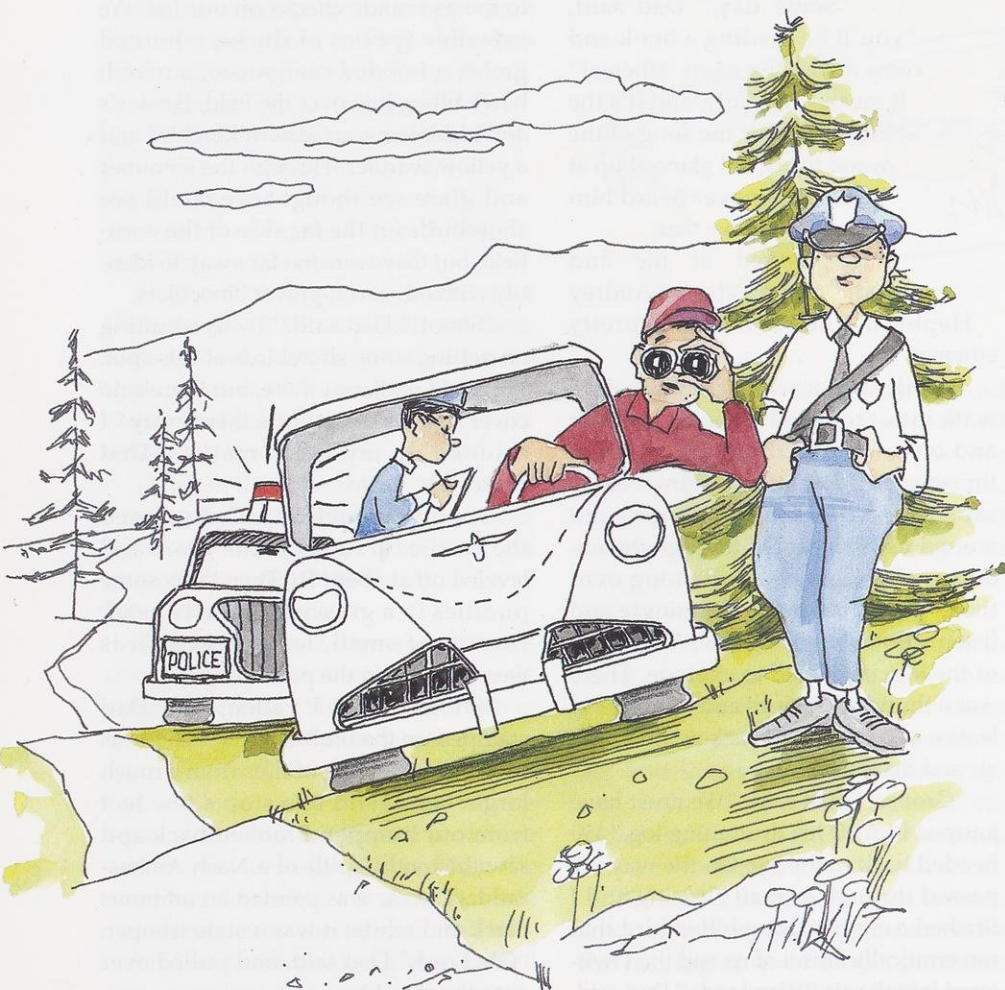
Dad lit his pipe as the trooper drove off. "Were you marking those birds down as I was calling them off?" he asked, all business again. "We've got a 50/50 chance of being right on the yellowlegs and dowitchers. Mark down one of each." I counted them up. "That makes 36," I said.

On the way back home, Dad and I looked in four directions at once. The sun was well above the horizon, and we picked up eight more species flying or perched near the road: a turkey vulture, a red-tailed hawk, a chimney swift, numerous crows and starlings, an eastern meadowlark, a sparrow hawk and a goldfinch. I added the checks as we pulled up the driveway — the total was now 44.

As Dad eased the Studie into the maze of parked cars on our lawn, I spotted Nip and Jeff working the crowd of breakfast eaters, polishing off bacon crumbs, cold eggs and sausage scraps, their white-tipped tails waving. People were lining up to feed them. "I hope they don't get too many eggs," Dad said. "These folks are all going home this afternoon, but we'll have to live with two gassy beagles for a couple of days."

We walked around the house to check out the back yard and the bird feeders, and picked up seven more species: a robin, a chickadee, a mourning dove, a downy woodpecker, a white-breasted nuthatch, a palm warbler and a house wren. I added up the checks again. "Fifty-one," I said. "Halfway there," Dad muttered.

The next stop was Rahr's farm, across the road from our place. We walked along the half-mile farm driveway and saw 15 species — a great blue heron, a killdeer, a phoebe, a blue jay, three kinds of swallows, a catbird, a cardinal, chipping and song sparrows, red-winged blackbirds, a grackle, a cowbird, and a rock dove. I checked them





off. "That makes 66," Dad said. "Two-thirds of the way there."

"Two-thirds of the way where?" I asked. "To the century run," Dad said. "That's what you call it when you get 100 species in a day. I never thought we could do it, but now we have a chance. We've got almost three hours to pick up another 34 birds. We could have a century run by noon! And we haven't even been to a good warbler spot yet. Let's get going!"

Now that we had a goal to shoot for, our birding took on a fresh intensity. The nearest good warbler spot was Evergreen Cemetery, on the outskirts of Manitowoc about a mile away. Dad let the Studie coast to a stop at the west edge of the cemetery, which was bounded by a stand of box elder trees and honeysuckle bushes that attracted migrating warblers every year. As we got out of the car, we could see small birds flitting from branch to branch, never spending more than a few seconds in any one place. Warblers were there in droves.

But the mild weather that had brought the warblers had also sped up the emergence of leaves. The box elders already had leaves the size of squirrels' ears, and the honeysuckles were almost fully leafed out, making the birds hard

to see. We spotted a chestnut-sided and a magnolia, but the rest of the warblers were hidden by foliage.

Dad put his pipe in his mouth and drew through it before filling it. "Drat," he said, "it's plugged up." He blew through it, but the shred of tobacco stayed put. He pursed his lips and sucked on the end of the stem, and the pipe made a kissing sound ending in a smack. He sucked again and made another smack. I looked back at the honeysuckles and saw a half-dozen myrtle warblers flutter to the outside edge of the bushes, followed by a Cape May and a Blackburnian.

"Do that again, Dad!" I said. "It's attracting them!" And it was. In about a hundred yards of walking and smacking, we saw six more species of warblers — bay-breasted, blackpoll, black and white, redstart, Canada and Wilson's — plus a rose-breasted grosbeak and a Baltimore oriole, all brought out of the shrubbery and tree-

tops by Dad's pipe.

"The next time I buy a new pipe and your mother complains, I'll tell her it's a bird call," Dad said. "That makes 79 — we're getting close. Let's go to the park."

Lincoln Park was on the east side of town near the lakeshore. In its center was a stand of big oaks and pines crisscrossed with cinder paths. We walked fast, looking at our watches every couple of minutes, and saw eight new species: a pewee, a great crested flycatcher, three kinds of vireos, a red-breasted nuthatch, a ruby-crowned kinglet and a common yellowthroat. We circled back to the car, walking as quickly as we could. Suddenly Dad stopped in mid-stride and raised his binoculars.

"On the trunk of that big white pine," he said. "See it? A little greenish bird, no wing bars, no eye ring. I think it's an orange-crowned warbler, but I can't be sure. Could be a Philadelphia



"only 99"

99?



vireo — Oh rats, it flew."

"Should I count it?" I asked. "No," Dad said. "I'm not really sure what it was. Let's save it for an emergency."

"Well, that makes 87," I said, "not counting the little green bird."

Our last stop was a small estuary where the Little Manistowic River flowed into Lake Michigan. It was alive with waterfowl; the problem was finding birds we had not already seen. We managed to sort out 12 new species — red-breasted and common mergansers, ring-billed and herring gulls, blue-winged and green-winged teal, a pied-billed grebe, a coot, a Canada goose and a common goldeneye, plus a Caspian tern and a kingfisher.

I totaled my check marks, counting under my breath from the top of the list. "99, 100!" I yelled. "We did it. The century run!"

Dad looked at me with a broad grin. He was not a demonstrative man, but he grabbed me in a bear hug, and then quickly let me go when his binoculars began to crush my ribs. Dad looked at his watch. "A hundred species with 40 minutes to spare — let's head for the barn," he said.

We were a couple of happy birders as we drove out River Road to our house. A cold east wind had begun to blow off the lake, and the crowd had thinned a bit when we got home at twenty to twelve. I headed up to my bedroom to get my leather jacket, and as I put it on I realized I still had the bird list in my shirt pocket. I sat down

at my desk, picked up a sharp pencil and re-counted my check marks, subtotaing at the bottom of each page.

I added up the column of figures. The total was 99. Fear clutched at my heart. I added again. The total was still 99. It was ten minutes to twelve. My brain began to churn. Of all the birds we had not seen, which one could we find in the next 10 minutes?

I glanced over at a display of bird pictures that Mom had hung on my bedroom wall. At the very bottom was a woodcut of a sparrow bathing in a puddle, with a little poem:

*The muddy sparrow,
Mean and small,
I like by far
The best of all.*

House sparrow!
I looked at the checklist. I had not checked off the house sparrow. Of course, we had seen house sparrows that morning; they were everywhere, like avian wallpaper. But we had not identified one.

I ran outside and found Dad. "I miscounted," I said. "We've only got 99. We have to find something right away, or otherwise count that little green bird from Lincoln Park."

"It's tempting," Dad said, "but it

would be cheating."

Then I remembered something I had read about horses and house sparrows: Horses eat oats, and house sparrows feed on the undigested oats in horse manure. I had no idea where to find a horse, but there were cows aplenty right across the road. They would have to do.

"Come on!" I shouted, and started down the steep path from our yard to the farm driveway. Dad followed. We squeezed through Rahr's big wooden gate and ran out into the pasture. Not 50 feet away was a fresh green cowflop the size of a manhole cover, and perched on it was a male house sparrow picking at seeds, his feathers ruffled in the wind. We looked at him through our binoculars, to be sure, and I made the hundredth check on the list. We had done the century run, and were a shoo-in for the father-and-son.

Dad sat down to catch his breath. He took his pipe from his pocket and tapped the bowl on his palm.

"Good old Wisconsin," he said. "There's always a cow around when you need it." ■

Author's Note: Birders who wonder about some of the species mentioned in this story should be aware that over the years, the names of many birds have been changed to confuse the innocent. In 1953, we were using the second edition of Peterson's Field Guide, and I have adhered to the names in use back then. In the

meantime, for example, the fulvous tree-duck has become the fulvous whistling-duck, the olive-backed thrush has become the Swainson's thrush, the marsh hawk has become the northern harrier, the Wilson's snipe has become the common snipe, and the sparrow hawk has become the kestrel. I have used lower

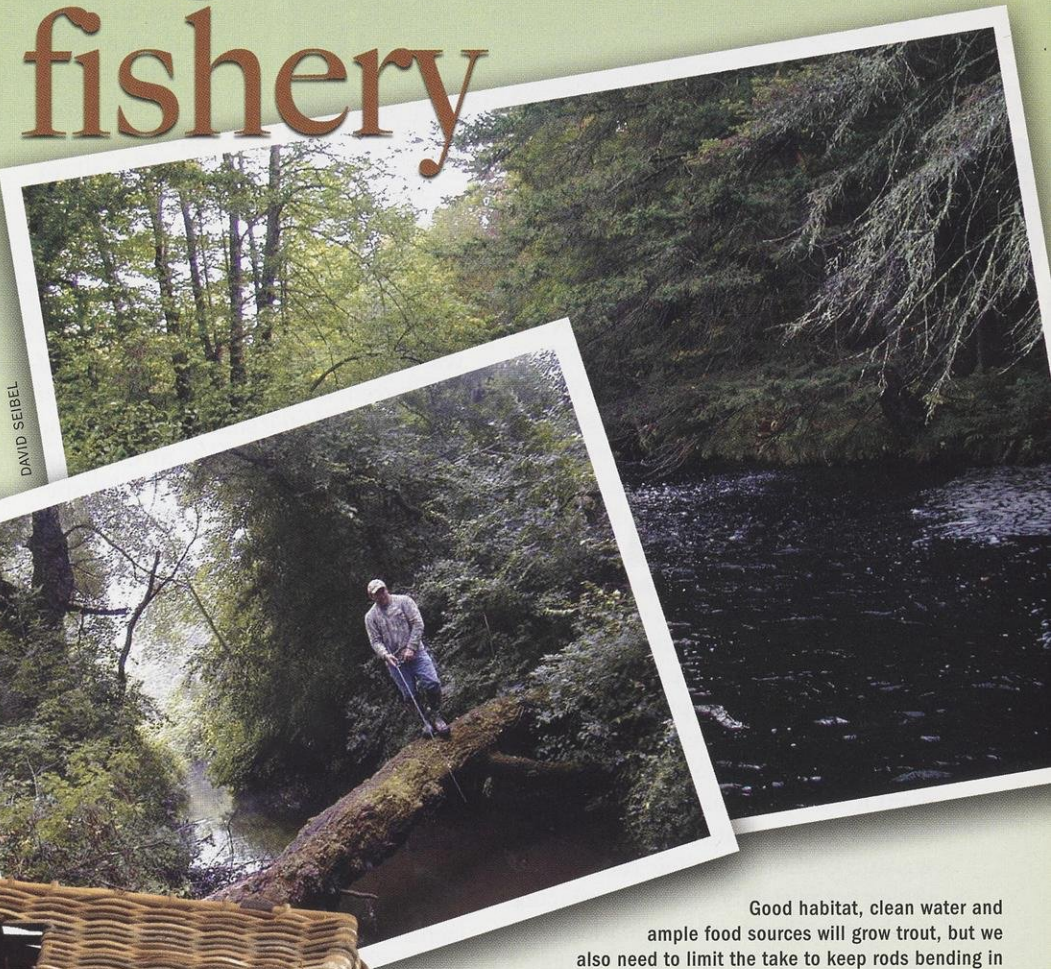
case for bird names that do not include proper nouns because I think the copy looks better that way, and to avoid hitting the shift key any more than necessary. I have also avoided the trendy practice of listing bird names without articles, as in: We saw starling and cowbird, when in fact a starling and a cowbird were seen. The "a" key is easier to hit than the shift key.



Tailoring the take to the fishery

In some streams, special size and bag limits can encourage trout populations that better match angler expectations.

Larry Claggett



Good habitat, clean water and ample food sources will grow trout, but we also need to limit the take to keep rods bending in areas anglers prefer. "Special" (Category 5) regulations limit the harvest, but these waters provide better opportunities to catch more fish and bigger fish in pretty settings.

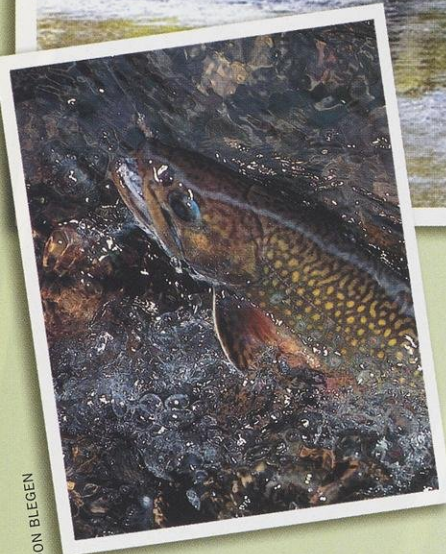
As with all natural resource programs, providing quality fishing on trout streams is as much about working with anglers and improving habitat as it is about providing fish. Wisconsin's trout fishing regulations are designed to provide different experiences and opportunities that the trout-fishing public is seeking. Collectively and individually, they have wide-ranging interests.





COURTESY OF JOHN E. NELSON

LEFT: In Sheboygan County, the combination of habitat work and special regulations increased the catch rate of brown and rainbow trout on the upper reaches of the Onion River by more than 1,320 percent in the last decade. BELOW LEFT: On the Prairie River in Lincoln County, reductions in the bag limit and special size limits increased the catch of larger brook trout by nearly 840 percent.



DON BLEGEN

In a broad survey done in the late 1980s, most trout anglers

rated being outside in nature and the physical beauty of trout as important factors that kept them satisfied when fishing, but there were differences among fishers as well. Some anglers want to catch lots of trout. Others are seeking fewer, but larger fish. Some want to eat some of their catch while others are perfectly content to practice catch-and-release as long as their rods keep bending. To provide a range of opportunities on streams that can meet those desires, fisheries biologists proposed a category system of trout fishing regulations back in 1990. Three of those categories (1-3) were designed to increase trout harvest for those who want to keep and eat their catch, and two (4-5) were meant to improve the catch rate and size of fish caught. Category 5 regulations were deemed "special" because they combined various regulations tailored to each water and were designed to maximize catch rate and size of trout that would be subsequently released.

A brief history of trout fishing regulations might help here to understand how we got to where we are today. Prior to 1990, most streams had general statewide regulations that allowed each angler to keep 10 trout over six inches in length per day (five browns and rainbows during May). A southern zone of counties established in 1986 had a three

waters comprised less than one-half of one percent of the total of 9,560 miles of trout stream in the state. Bob Hunt, one of our trout researchers at the time, found that the waters where these special regulations were put in place were used by more anglers than other streams, they attracted greater use by nonlocal and nonresident anglers, more anglers came back for return visits, the catch rates were substantially better, and ratios of trout released per trout kept in the creel helped bulk both the size and number of trout in these waters. Therefore, the group of biologists working on 1990 regulations recommended expanding the group of special regulation waters. That number was increased to 91 streams and 280 miles, or about three percent of the state total.

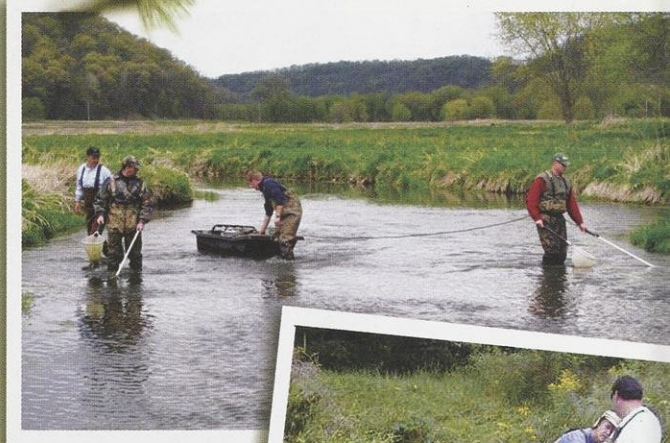
Half of these special regulations used slot-sizes to regulate the harvest (where fish above and below a certain size have to be released). About one-fourth of the waters relied on larger minimum size limits before fish could be kept, and catch-and-release requirements were put in place on the remaining fourth of special waters.

The effects of those regulations were reviewed and revamped in 2003. Category 1 was dropped to sim-

plify the number of streams that had to be listed in the trout regulations pamphlet, and special regulations were adjusted to better fit the streams where they were used.

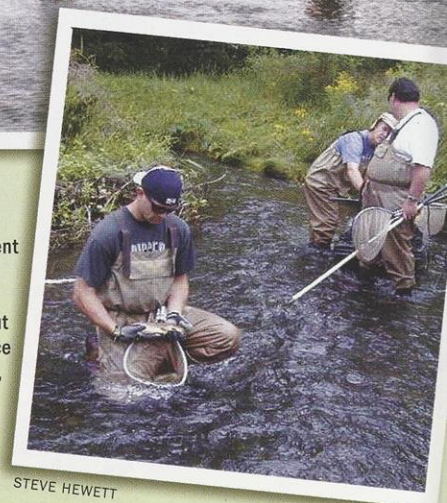
The benefits of fishing regulations on fish populations are not always easy to detect because so many natural factors also influence how well fish populations survive and thrive. Drought, floods, stocking, habitat changes, water quality and predators can all have an effect. We really need to look at long-term trends before judging if a regulation change helps in a particular stream, lake or river. We sample trout populations by using an electrofishing tow barge — a small skiff that we typically drag behind us as we don waders and slog our way upstream. Electric probes in the water temporarily stun the trout. They float up, we net them, measure and examine them, and sometimes fin-clip the fish for recapture studies.

We used those techniques to study the consequences of changing trout regulations on the Tomorrow River in Portage County and the Prairie River in Lincoln County. On the Tomorrow

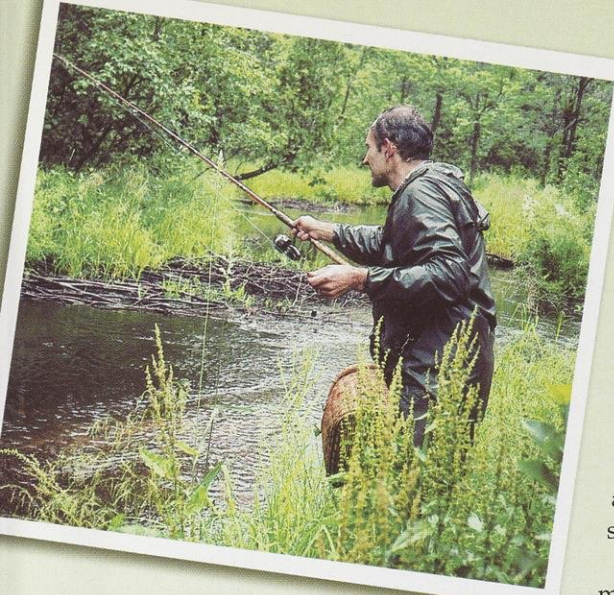


STEVE HEWETT

Fisheries biologists tow a small barge with equipment upstream to sample fish. Careful stream shocking temporarily stuns the trout so they float to the surface where they can be netted, weighed, measured, clipped and returned to the water quickly.



STEVE HEWETT



DON BLEGEN

River, regulation had changed from a bag limit of 10 fish (five browns) over six inches, to a bag of one brook trout at least 10 inches long and a minimum size of 18 inches for brown trout. Artificial lures were required to reduce hooking mortality. Surveys were done nearly every year starting in 1988. Population estimates were averaged from 1988-91 before the regulations were put in place and compared to post-regulation years (1995-97) after waiting a few years for the populations to stabilize. Brown trout showed an increase from 469 fish per mile to 709 fish per mile. Brook trout populations stayed about the same at 400 fish per mile, but the average size of both species improved. Brook trout over eight inches improved from 13 percent of the adult population to 21 percent. Brown trout over 12 inches increased from 5 percent to 20 percent, and brown trout over 18 inches increased tenfold from 0.3 fish per mile to three fish per mile. The special regulations were successful in producing a good catch-and-release fishery that could sustain harvesting some fish.

On the Prairie River in Lincoln County, the regulation changed in 1993 from a 10-fish bag limit (five browns) over six inches, to a two-fish bag limit with only one brown trout over 20 inches and one brook trout over 14 inches. Trout population estimates were compared from two years (1985 and 1988) before the changes, to four different years (1995, 2004-06) after the regulation. Brook trout over 10 inches improved 840 percent, and brown trout of quality size (over 12, 14, and 16 inches) all increased over 100 percent. Some of these changes may be attributable to

Anglers have accepted different regulations on several trout waters in return for having a greater chance of catching more fish and/or larger fish.

habitat improvements made in this stretch in 1985. Regardless, the habitat work and the regulations working together have greatly improved the size and numbers of trout in this stretch of stream.

More recent changes were made on the Onion River in Sheboygan County in 2004. The upper part of the watershed was changed from a bag limit of three and a nine-inch size limit to a bag limit of one fish of at least 15 inches in length. The lower part of the river continues to have the three-fish bag, nine-inch minimum size limit.

The river was surveyed before the change in 1997 and after the change in 2006. In addition, a lower section of the same river where these regulations are not in place can be considered a control stretch to compare to the upper section. In the special regulation section, the catch rate of brown trout increased by 1,327 percent from 1997 to 2006. This compares to an increase of 379 percent in the control section. The percentage of fish over 12 inches was 14.3 percent in the special regulation section and 9.4 percent in the control section. Although all indices increased due to improving conditions in the watershed, they clearly increased more in the special regulations section.

Though we've had some success, fisheries biologists have also learned from mistakes that special regulations don't work in all situations and we can't always judge ahead of time which streams will respond well when we lower angling pressure aiming to grow larger, healthier

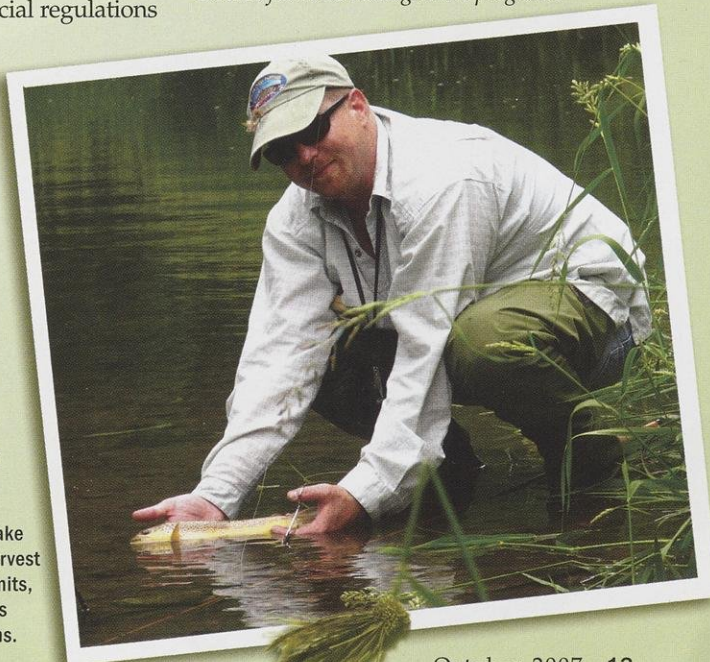
Habitat changes and angling pressure vary over time. It can take several years to fine-tune the harvest to determine what mix of size limits, bag limits and fishing techniques produce healthy trout populations.

fish. For instance, on Rowan Creek in Columbia County, putting a 12-inch minimum size limit resulted in less fishing, less harvest, and no appreciable increase in numbers or size of brown trout. The regulation was subsequently changed back to the standard in the rest of the county streams of a three-fish bag limit with a nine-inch size limit.

Yet a different experimental regulation shows promise in thinning crowded trout populations while increasing the numbers of larger fish. On Sand Creek in Polk and Barron counties, surveys from 1999 and 2007 show the number of brown trout caught increased from 39 fish per stream mile to 129 fish per mile. And the number of big browns (better than 14 inches in length) increased from seven to 36 fish per mile after special regulations were put in place. In a nearby control stream, South Fork Clam River, the numbers of brown trout of similar sizes decreased over a similar time period.

In summary, special regulations, applied in the right situation, can measurably increase both the numbers and size of large trout, providing different kinds of fishing challenges for anglers willing to work with biologists to limit their takes and adjust fishing techniques to provide a wider variety of fishing experiences. ▀

Larry Claggett is DNR's coldwater fisheries ecologist. Data and photos for this story were provided by John Nelson, Heath Benike, Tom Meronek, Dave Seibel and Tim Larson of DNR's fisheries management program.



JOHN KOCH

Cunning corvids

Learn a thing or two about the Einsteins of the bird world.

Kathryn A. Kahler

Their attributes read like an ad in a singles column: Intelligent. Communicative. Good sense of humor. Family-oriented and looking for long-term relationship. Community-minded and unhesitant in sticking up for their friends.

With such endearing qualities, one has to wonder why the crow doesn't get a little more respect. The species has been associated with darkness and death throughout history. Mark Twain described it as "a low comedian, a fussy woman, a scoffer, a practicer and propagator of irreverence and a busybody." Instead of letting myth or legend jade our opinion of crows, let's take a look at some of the facts about this much maligned bird.

A member of the Corvidae family, which includes ravens, magpies, jays and nutcrackers, the American or common crow (*Corvus brachyrhynchos*) is one of the most common North American birds. It's found across a wide range of habitats from coast to coast and from the northern reaches of Canada throughout the United States, except for a thin strip near our southwestern border. Other members of the *Corvus* genus include the northwestern crow, the fish crow found mostly in southeastern

coastal states, and the common raven. One occasionally sees ravens — distinguishable by their larger size and shaggy throat feathers — in northern Wisconsin.

Aside from some parrots, the American crow and its cousins worldwide are considered the most intelligent birds, close to humans in their brain-to-body ratio. Betty, a New Caledonian crow, attained celebrity status a few years ago when she was videotaped shaping straight pieces of wire into hooks to fetch out-of-reach food in a laboratory setting, not just once, but nine out of 10 times. Wild crows of that species use their beaks to fashion twigs and leaves into tools to poke and prod into crevices in search of grubs and insects. Crows have been observed flying higher and higher then dropping mussels and walnuts onto hard surfaces to crack them open. Crows in Japan were seen setting nuts in roads then hopping up on the curb and waiting until cars drove over the nuts before hopping back to retrieve their dinner.



JACK R. BARTHOLMAI

Their eyes aren't the only bright feature on crows. In animal intelligence tests they consistently outscore rats and often dogs. Crows fashion and use tools and will tag-team with other crows to find food, cache food and drive off predators.

Crows also take part in cooperative feeding, a kind of tag-team effort used to steal food from larger birds, or even mammals. Reportedly, one crow will sneak up behind a bird with food in its mouth and pull a tail feather. When the bird turns to defend its meal and drops its food, another crow swoops in and recovers it. Similar encounters involve crows pulling otters by the tail to nab their meals. Even ice-anglers are the victims of crows' craftiness when they steal bait from unattended fishing lines.

Caching food is another crafty crow tactic. Crows, like other corvids, stash excess food in hiding places, usually in holes in the ground that they cover with dirt, leaves or stones. If a crow thinks it's being watched, it will recognize the risk of giving up the location of its nest and hide a morsel of food, rather than take it directly to the nest. If a raven thinks another bird has spied its cache, it will fly back after the other bird is gone and move, or re-cache the food to prevent pilfering.

Nathan Emery and Nicola Clayton reported in the December 2004 issue of *Science* magazine that caching and re-caching food is evidence that corvids are equal to apes in their ability to reason from a cause-and-effect perspective. Like apes, corvids also show flexibility, imagination and prospection, or future-thinking.

"Cache recovery may require more than simply remembering where their caches are hidden, for species that store many types of food," they observed. "These species may need to process information about the location of the cache site, the type and perishability of the cached item, and the social context of caching."

Other corvids may worry about perishability, but crows seem to relish all food in varying degrees of decay. A better question than "What do crows eat?" would be "What don't they eat?" Studies show that crows eat over 600 different food items, one-third animal matter — like insects, worms, larvae, fish, frogs, snakes and roadkill — and two-thirds vegetable matter. Their vegetable of choice is corn, but crow fanciers contend they do more good than harm to cornfields, consuming thousands of

cutworms, grasshoppers and harmful weeds, and gleaning kernels from picked fields to prevent volunteer plants next spring. Urban crows add all manner of garbage — bread, spaghetti, even French fries — to their varied bill of fare.

Scientists may speculate or disagree about its purpose, but of this they are certain — crows play. How else could one describe this behavior reported by a birder in Springfield, Ohio? "I spotted three crows on a short grass lawn alongside the road on the outskirts of town. Two of the birds were standing and walking around in the normal fashion but the third was lying on its back, moving its legs in a 'bicycling' motion reminiscent of one of the exercises I was forced to do in physical education class in school."

Young birds drop sticks from their bills in flight and catch them before they hit the ground, or use them to play tug-of-war. They perform aerial acrobatics in gusty winds and swing upside down from swaying branches or vines. They dance to the beat of an imaginary drummer as they bounce and jump with outspread wings.

Communication is another characteristic that sets crows apart from other less outgoing species. Crows have about two dozen calls, ranging from their distinctive caw-caw to clacking, rattling or gurgling sounds. They mimic all sorts of other beings, such as humans, cats, dogs, geese and their most hated predators, barred and great horned owls. Some of their varied calls are a means of keeping in contact with mates and offspring, and another acts as a call-to-arms for any crow within hearing distance to drop everything and join the mobbing of a predator.

Mobbing behavior is initiated when a crow observes a predator near its nest or anywhere else, for that matter. The



KEVIN SPATT

Crow language skills are also highly developed. They employ more than two dozen distinct calls to note territory, attract mates, rally company, alert other birds of dangers and defend other crows. They are also superb mimics of human, cat, dog, goose and owl sounds.

crow begins its loud, raucous cawing and keeps it up until joined by others in the vicinity. The din reaches a riotous level. The behavior serves the two-fold purpose of alerting others to danger and sometimes driving off the offending predator.

Stan Temple, retired UW-Madison wildlife ecologist and falconer by avocation, described an encounter with one of his hawks. His red-tailed hawk caught a crow and brought it to the ground. The screaming of the captured crow sounded the alarm for the crows in a huge nearby roost and "They descended like a black tornado on the hawk," and the captured crow got away.

When it comes to family life, crows are exemplary in many respects. They mate for life and provide for their young longer than any other bird. The lovefest begins in March or early April when both male and female pick a nest site, usually high in the crotch of a tree, and get to work constructing their home. They always start fresh with a new nest each year. The male does the heavy construction, forming a base of large sticks. His mate provides a


feminine touch, shaping an inner bowl of twigs, bark and mud, lined with soft grasses, feathers and fur. Four or five brown-speckled aqua eggs are incubated by the female and hatch in 19 days, usually by early May. The males don't share incubation responsibility, but bring food to their mates while they are on the nest. Young stay in the nest for 35 days and fledge in six to eight weeks. They are usually food-independent by early August. With that long a nesting period, crows usually have only one successful brood a year.

That's where similarities with other species end. Unlike most other birds, crows don't rush matters when it comes to rearing their young. After fledging, young birds stay with their parents for one to three years, sometimes as long as five years. These adolescents help their parents raise subsequent broods by bringing food to the incubating female and chicks still in the nest and chasing away predators. Scientists call this behavior cooperative breeding. These extended families of parents and siblings of differing age groups, commonly 10 to 15 birds, stay on the breeding territory, forage and roost together throughout the summer.

In fall and winter, crow families may leave their home territories and assemble in small neighborhood groups at designated staging areas late in the afternoon. At dark, the flock takes off and moves to a nighttime roost, joined by other neighborhood groups from miles in every direction. These communal roosts can attract hundreds, thousands,

even hundreds of thousands of birds and are usually located near a reliable food source, like a landfill or cornfield. Come morning, the roost empties quickly as the smaller flocks find their way back to individual territories. In spring the roosts break up when the nesting cycle begins anew.

Crows are considered partially migratory, depending on where they live within their range. Birds in the northernmost parts of Canada, where minimum temperatures average 0°F, will migrate to Nebraska and Oklahoma, where roosts have been known to hold half a million birds. Wisconsin crows probably stay put most of the year, especially in mild winters like those of late. During the winter roosting period, individuals may spend time on their breeding territory during the day and join the communal roost at night. Other non-breeding juveniles may leave home for the winter and return to the breeding territory in spring to help raise their new brothers and sisters.

So come garbage day if you find that crows have had their way with your pizza boxes and cold French fries, consider this — they've got a family to feed. Get a heavier lid for the garbage can or you might just find them picking their way through the grease-stained newspapers to the personals column, to find the perfect mate and take up residence over your driveway. 

Writer Kathryn A. Kahler recently retired from her position as circulation, promotions and production manager of Wisconsin Natural Resources magazine.

A premonition when West Nile strikes

Though there isn't much published research on the subject, American crow populations seem drastically affected by West Nile virus (WNV), both in virulence and numbers of birds killed.

Crows' intelligence makes them extremely difficult to study by traditional trapping/marketing techniques. Most studies rely on testing collected dead birds or infecting laboratory birds with the virus. This research shows this extremely virulent virus introduced to the United States in 1999 hits crows harder than other wildlife species. In the lab, 97 percent of the crows experimentally infected with the virus died. Another study found only three percent of a sample of over 100 live wild crows in Illinois had WNV antibodies in their blood. That means most don't survive infection.

Once infected, most crows die within one season, as many as 72 percent in a Stillwater, Oklahoma study done in the summer of 2002. Field studies in Kentucky and New York, where bird carcasses were collected and tested, showed that crows had the highest infection rate of all species tested — 44 percent of 12,500 birds in New York and 87 percent of 1,549 birds in Kentucky. In one of the few population studies of its kind, a 2002 University of Illinois banding study found WNV responsible for 90 percent of American crow deaths during the study period.

These statistics might suggest that crow populations nationwide would decrease as WNV moved westward, but monitoring efforts such as the Christmas Bird Counts don't back up that notion. While some states have seen crow populations decline over the past 10 years, others have seen substantial increases, even in years with significant incidence of WNV. Nationwide, these annual crow counts in 2006 were 13 percent lower than in 1999, with peaks and valleys in between. The crow count in Wisconsin registered 14,000 in 1999, peaked at 22,000 in 2002, and declined slightly to 17,000 this past December.

Crows are extremely social. Outside of the breeding season they gather, feed and amass in huge communal roosts. Crows will assemble to harass and drive off predators in a behavior dubbed "mobbing." No wonder a group of crows is called a "murder."

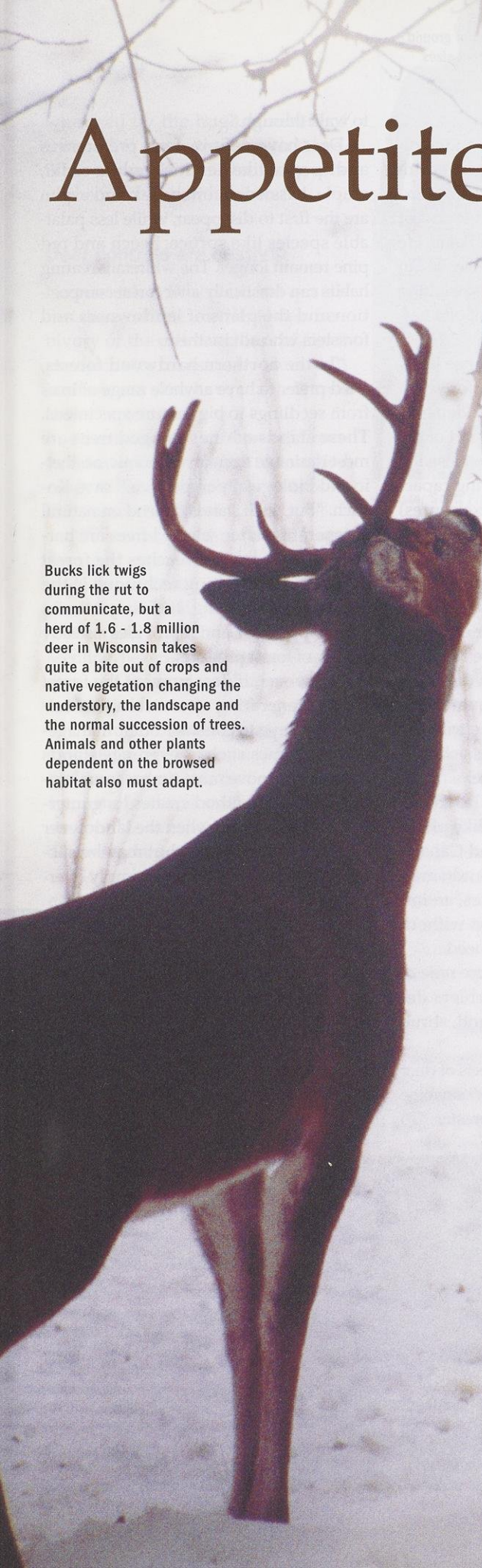
BOTH PHOTOS BY JACK R. BARTHOLMAI



Appetite for trouble

How browsing deer change the landscape in forests, croplands and homesteads.

Robert J. Manwell



Bucks lick twigs during the rut to communicate, but a herd of 1.6 - 1.8 million deer in Wisconsin takes quite a bite out of crops and native vegetation changing the understory, the landscape and the normal succession of trees. Animals and other plants dependent on the browsed habitat also must adapt.

No other wildlife animal in Wisconsin generates as much enthusiasm, economic clout or discussion as the white-tailed deer. Given so much interest among so many, how could there be too many whitetails? The answer depends on who you talk to once you understand how the whitetail fits into its environment.

Aldo Leopold, whose text *Game Management* was a foundation of modern wildlife management, warned as far back as the 1930s and 40s of the threat overabundant deer populations pose to forests. At the time, sighting a deer in many areas of the state was something of a novelty. By contrast, seeing deer today is commonplace — sometimes too common.

For nearly two decades, deer populations have been above community-established goals. A long succession of mild winters has increased deer productivity and survival. The popularity of food plots, baiting and feeding has added to deer herd growth. Meanwhile, land ownership changes have reduced hunter access. All of this has confounded proper deer herd control.

This fall, wildlife managers estimate Wisconsin's white-tailed deer population will top 1.6 million animals. Deer find Wisconsin's landscape mosaic of farm, forest and suburbs much to their liking, and their numbers and browsing habits are changing the forests and woodlots they inhabit.

Browsing, or deer "herbivory," as it is referred to by foresters and biologists, is measurably altering the make-up and diversity of the forest floor. Returning to pioneering research conducted by ecologist John T. Curtis, a study team of University of Wisconsin researchers (Rooney, Wiegmann, Rogers and Waller), found that over the last 50 years the number of native species had declined by an average of 18 percent on 62 of Curtis' study sites that had been browsed by deer.

Deer are a "keystone species." As their numbers increase, the plants they prefer for food become less abundant or are lost. This in turn takes a toll on small mammals, birds and insects that rely on ground-level herbs and shrubs for food and cover when breeding, nesting, foraging and escaping predators. Further, these plants are often replaced by less desirable species.



ROBERT QUEEN

Forests with fewer deer fill in with a mix of ground cover, shrubs and tree species of different sizes and ages.

deer goes far beyond forest trees.

"When populations of browsing animals attain high densities, the plant composition of the forest floor can also be expected to change," says University of Washington biologist Robert T. Paine. He first coined the term "trophic cascade" in 1980 to describe chains of events resulting from changes in one component of a natural system.

The consequences of a large deer herd have concerned biologists for years. Local effects vary considerably depending on the number of deer, the part of the state and other factors like how close the deer population is to the carrying capacity. Small fenced areas (deer exclosures) around the state clearly show how high deer populations or local deer concentrations can greatly reduce the variety and abundance of forest plants.

Even small numbers of deer can have dramatic consequences where the land can't support a larger herd. At a deer density of 12 to 15 animals per square mile of range, herbaceous plants like trillium, Indian cucumber, showy lady's slipper and white fringed orchid decline.

When deer densities reach 20 to 25 animals per square mile, species like pines, white cedar, hemlock, oaks and Canada yew may stop regenerating and small mammals like red-backed voles, an important prey species, starve out without the forest floor vegetation they need.

At 25 to 35 animals per square mile of range, birds like hooded warblers decline from lack of needed ground, shrub and tree layers.

"To an untrained eye the effects of deer browsing can be difficult to see," says Joe Kovach, a DNR field research forester. "To many folks, a clear understory or one that is full of ferns topped by mature trees looks like a park, an inviting place to walk, picnic or hang out. In contrast, visibility is more limited in a forest with healthy regeneration in the understory. It can be thick with plants that are very difficult

to walk through."

Deer have definite food preferences and species like hemlock, white cedar, maple, basswood, birch, oak and aspen are the first to disappear, while less palatable species like spruce, beech and red pine remain longer. The whitetails' eating habits can drastically alter forest composition and the plans of landowners and foresters who advise them.

"In the northern hardwood forests, we'd prefer to have a whole range of trees from seedlings to big mature specimens. These stands of uneven-aged trees are most desirable from an economic, aesthetic and biological perspective," says Kovach. "But, such stands depend on natural regeneration after selected trees are harvested and sunlight reaches the forest floor. This harvesting technique is the most natural-looking. It closely mimics natural processes and it provides a steady supply of forest products."

"However, if deer prevent the forest from regenerating after a selective cutting, we have to consider other management schemes such as even-age stands where we remove more timber from larger areas. This method creates long intervals between times when the landowner can earn some income, but may be successful because the deer are simply over-

Deer browsing also bites into the forest economy by reducing landowners' ability to establish new tree plantations or regenerate harvested areas. On numerous sites, regeneration of valuable forest species is at a standstill. Valuable seedlings are nipped off repeatedly, never getting a chance to grow more than a couple of feet in height, if that.

Deer replace cattle as primary woodland grazers

"Twenty years ago, when I started my forestry career, one of my first jobs was working with landowners to fence cattle out of the wooded portions of their pastures," said Scott Fischer, a DNR forester in Bowler.

"The cows were selective grazers and happened to prefer the more commercially valuable maple, ash and oak seedlings found under the canopy. After a while, these woodlots looked like parks with few or no tree seedlings. In their place, the understory filled in with plants the cattle didn't like such as ironwood, prickly ash, hickory and white birch.

"DNR foresters would decline assisting landowners who were planning harvests in those grazed woodlots because if cattle grazing continued, there would not be any natural tree regeneration and that forest could not sustain itself. Now, we are faced with a similar situation only it is deer that are retarding or preventing regeneration in harvested areas."

In a 2005 survey, 81 percent of DNR foresters identified browsing deer as a significant barrier to reforestation, natural regeneration and successful tree planting. And, the damage attributed to hungry



ROBERT QUEEN



ROBERT QUEEN

ABOVE: Where deer are plentiful, ground cover and the shrub layer gets grazed and browsed so heavily that most of the understory can disappear. It looks open and inviting, but this forest contains far fewer species and provides less protective cover for other animals. LEFT: This little area was fenced in to let an apple tree grow. The lush growth of many plants within the fenced area shows how heavily deer feed in the surrounding area.

whelmed by the huge numbers of trees all at the same growth stage. Some trees survive the browsing simply because of sheer numbers."

Deer controls are costly

No research in Wisconsin has quantified the economic impacts of deer herbivory or the estimated loss of forest productivity caused by deer, but landowners who have planted trees know the costs.

At a site in western Shawano County, forester Fischer points out stunted ash seedlings struggling to rise above the grass around them.

"Given the quality of this site and the weed control the landowner has undertaken, these white ash should be about four feet tall," says Fischer.

Leaning over an oddly-shaped seedling, he observes "this tree shows evidence of being nipped seven times already this season.

"Summer browsing brings the worst kind of damage for hardwoods. Extensive leaf damage prevents the tree from manufacturing food and weakens it, making it susceptible to other plant competition, disease and insect attack.

"It only goes to show that the high deer populations are forcing deer to feed on less desirable species in order to get enough to eat."

"Imagine the heartbreak experienced by this landowner," adds Kovach. "He is reaching the point where the entire project may be lost. He's replanted twice already, adding 1,000 additional seedlings in each of the last two years. He stands to lose about \$7,000 in his investment."

Agriculture and transportation

High deer populations lead to other costs as well. Statewide deer damage to corn crops alone were estimated to be as high as \$15 million a year in 1993. Actual damage payments to farmers due mainly to deer browsing are running about \$1.5 million per year according to wildlife officials. The number of deer-vehicle collisions is in the range of 40,000-50,000 per year and combined property damage and personal injury from deer-vehicle accidents is estimated



ROBERT QUEEN



ROBERT QUEEN

Forester Scott Fischer shows how high the ash seedlings should be in this planted tree stand. ABOVE: He points out a misshapen seedling that was nipped back seven times already this season by feeding deer. This plot was already planted twice, but it's almost impossible to establish trees where lots of hungry deer feed.

to be over \$100 million per year.

The Wisconsin Council on Forestry also recognizes the problems landowners and foresters face. In a letter to Governor Jim Doyle, the council states "Deer herbivory is a serious problem that if not addressed will affect the sustainability of forestry in Wisconsin."

The County Forest Administrators Association submitted a resolution last year calling for deer herd control.

This alarm has also been sounded by the Wisconsin chapter of the Society of American Foresters which adds that "deer populations should be reduced to allow for the efficient and desired regeneration of forests, and to sustain a diverse array of plant and animal communities."

Addressing the problem

Many techniques have mixed results in reducing the consequences of deer browsing on forest regeneration and plantations. Fencing, tree shelters, bud caps and repellents can all deter deer browsing around plantations and high value crops like fruit trees. All are expensive and take much more labor after tree harvesting and planting. To recoup costs, producers have to pass on some of these costs to wood and pulp buyers.

"A tall fence is probably the best deterrent but it is obviously a very expensive undertaking," says Kovach. "Tree shelters — two- to three-foot plastic tubes wrapped around the base of young trees — can help, but they are labor intensive

to install, provide shade and moisture for some disease and insect damage, and in some cases will harbor rodents that damage the tree."

Repellents work best when deer densities are low, but they often have to be reapplied after each rainfall and a variety of products need to be applied to keep discouraging deer.

Deer hunting helps, but often is not enough

Deer population goals balance the "social" carrying capacity in farm country — the crop damage, reduced forest regeneration and vehicle collisions that people will tolerate — and the "biological" carrying capacity in forested regions — the maximum number of deer that can survive on the land under average habitat and weather conditions.

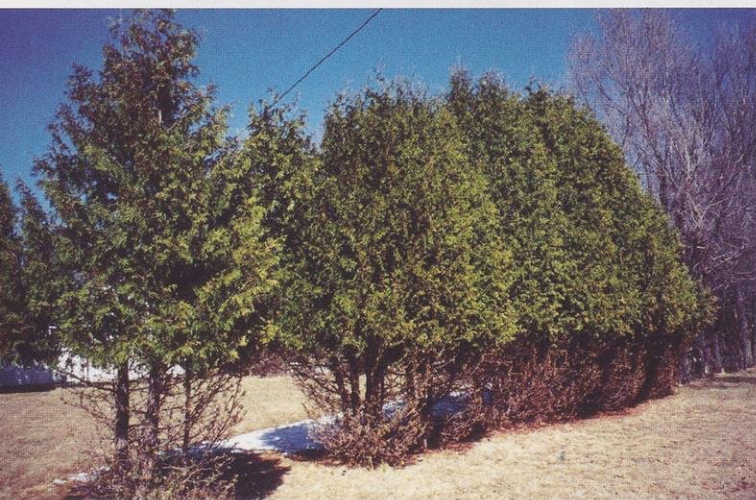
The primary tool that aims to keep the deer herd at these population goals is recreational hunting. Though the harvest has been impressive during the last decade, it doesn't hold a candle to the deer herd's ability to grow given food and shelter.

Over the last 10 years, Wisconsin hunters have harvested on average more than 460,000 deer per year. Population goals for deer management units vary from 10 to 35 deer per square mile of deer range. Yet, just 17 of Wisconsin's 130 DMUs currently are close to or at their goals.

In the unit that the author toured with foresters Fischer and Kovach, the



LEFT: During cold winters with deep snows, deer may yard up and concentrate near unoccupied shelters that are out of the wind.



BELOW: To stave off starvation in cold winters, deer feed heavily on every edible twig within reach, leaving a distinct browse line by the end of the winter season.

DNR WILDLIFE MANAGEMENT

DNR WILDLIFE MANAGEMENT

ally tailored to each landowner's objectives and use widely accepted forestry practices. By enrolling in the program, landowners can defer much of their annual property taxes until the time that they harvest timber. Taxes are then paid from the proceeds of the timber sale.

Knowing what forest practices to apply in the face of heavy deer browsing can be challenging.

"We see results on managed forest lands," says Fischer.

"We don't know how much browsing can be sustained before we need a radical change in the management plan, such as going from a shelter wood or selective cut management plan to perhaps a clearcut. And it may not be possible to grow new forests where deer numbers are too high regardless of the system we attempt."

"Browsing has nearly stopped forest regeneration in many areas. If as foresters we can't depend on the forest's natural ability to regenerate itself following a timber harvest, we have to ask ourselves if we really are practicing sustainable forestry."

Not all landowners have the same objectives for their property. One of the most hotly debated topics among landowners is hunting deer on their properties or allowing hunting access.

"Landowners have strong control over the makeup of their woodlot through timber harvest and planting," says Fischer. "But control over deer populations are another matter. Individual landowners can have only a limited effect on deer populations. It takes neighbors with similar management objectives to address high deer populations. If one neighbor

creates a refuge where deer are inaccessible to hunters or if the neighbor allows only limited hunting, deer can hide in protected areas during daylight and emerge at night to browse neighboring woodlands."

In addition to the ecological cost of deer browsing, inability of the forest to regenerate itself threatens the \$28 billion forestry industry in Wisconsin and the 96,000 jobs it supports. A steady supply of quality wood is the lifeblood of this economic machine and affects tens of thousands of small forest landowners. Much of the wood arriving at factories comes from privately owned woodlots. Fifty-two percent of Wisconsin's 34.7 million acres of forest land is privately owned. Many of Wisconsin's most valuable forest trees take 50 to 100 years to mature. Many landowners will only see one or perhaps two harvests on their property in their lifetime.

Large numbers of deer can clearly affect valuable trees, shrubs and flowers of forest owners and homeowners. A few industrial forest owners have even considered selling their land and buying other lands where herds take less of a bite out of their bottom line. Some Christmas tree farmers have resorted to high-priced electric fencing to protect their crops. Homeowners in both rural and suburban settings also complain about deer eating their prized landscaping plants as well as their gardens. When they are hungry, deer will browse trees and shrubs planted for windbreaks, screens between neighbors, backyard wildlife habitat and scenic beauty. Clearly, it takes a mix of strategies to address all these issues, but just as clearly, deer will not naturally resolve these issues in a manner that will be acceptable to people or the environment. The herd keeps growing and its appetite for vegetation is shaping both the physical and cultural landscape. ■


Robert J. Manwell is DNR's Public Affairs Manager for the DNR Lands Division, including the wildlife management, forestry, parks and endangered resources programs.

population goal is 25-30 deer per square mile. The actual population estimate in fall of 2006 was 95, more than three times the desired limit.

"Deer population goals must consider many things," says Kovach, and the state attempts to balance these public interests with sound biology. "There is the desire for hunters and wildlife watchers to see deer. There are the farmers' concerns over crop damage. There are the ecological impacts to consider. From a forest regeneration and diversity perspective, our established over-winter density of about 20 deer per square mile is reasonable — the problem is, we are way above those goals in most deer management units."

Deer impacts on their environment add to the challenge of practicing sustainable forestry. Many private forest landowners have enrolled their forested acres in the Managed Forest Law (MFL) program. A condition of enrollment is that the landowner file a management plan drawn up by a certified professional forester. Plans usually include periodic timber or pulpwood harvests and often prescribe converting cleared agricultural fields back into forest. Plans are individu-

THE WORLD DOWN UNDER



Caves in Wisconsin?
You bet! We can
help you find
them and
explore them.

Judy Nugent

To the Batcave, Robin!

No this isn't Gotham City, though we have one in Wisconsin, but who would guess that there are caves around the state large enough to fit the Batmobile and Wayne Manor? Well, it's true. And what you'll find inside can be even cooler than Hollywood's latest thriller — weird rock formations that look like they're from another planet, fuzzy bats clustered in far corners, an icy chill that brushes across your face, and strange carvings of buffalo that roamed the Midwest centuries ago. Sure makes going to the movies sound dull. Instead, pack up your family for an adventure they are sure to remember. Take them caving!

Looking up toward the entrance to a private cave in Crawford County. These dolomite rocks formed more than 470 million years ago as magnesium slowly replaced the limestone over thousands of years and built up a more durable rocky surface.

Types of Wisconsin caves

There are two types of caves in Wisconsin — limestone and sandstone. Limestone caves are the ones you might typically think of — stalactites dripping from the ceiling, dark, wet places with steady cool temperatures, and bats lurking in the corners. These caves are found in limestone rock formations and are the most prominent type found here. Sandstone caves formed primarily in the southwestern part of the state and are sometimes merely rock outcroppings or shelters. These tend to be much smaller and drier than their limestone cousins. Both types of caves offer opportunities for fun and adventure. The easiest to access are a few of the larger limestone caves that are open to the public.

Once inside a cave, curiosity soon takes over. How were the caves formed? Who found them? What are the different rock and mineral formations on the walls and ceiling? Why it is cold and damp?

As luck would have it, no two caves are alike, just as you never step into the same river twice. Each cave is ever-changing and constantly shapes the landscape above ground and underground.

Kasey Fiske, vice chairman of the Wisconsin Speleological Society (WSS), knows a lot about caves. "Limestone caves are also known as 'solution' caves that are formed by the dissolving limestone rock as the surface came in contact with water that is slightly acidic. It is sort of like seeing an Alka-Seltzer™ tablet dissolving in water."

Looking into vast caverns and rooms with high ceilings, it is hard to imagine Alka-Seltzer getting the job done. A key component is time — millions and millions of years of constant dissolving. Fiske explains, As rain water soaks into the ground, it filters through leaf and other organic matter, drops off larger particles and picks up dissolved carbon compounds. These carbon compounds combine with water to form a mild solution of carbonic acid. If there are some remnant petroleum products in the limestone, sometimes the sulfur compounds in the petroleum products attach themselves to the water and dissolve, forming a mild sulfuric acid. Both

of these acids will dissolve the limestone rock.

Water containing the mild acid solutions flows through the limestone rock formations following cracks in the earth's crust. As the mild acid dissolves the limestone the cracks get bigger and form passages. Some of the dissolved limestone and water comes in contact with air and re-solidifies. That is what makes formations inside the caves.

Most of Wisconsin's limestone caves were formed in this manner over millions of years, and the results inside can be spectacular. The different features that

decorate a cave are referred to as cave formations or speleothems. The most common speleothems are familiar to people, even if they can't remember which is which. They are stalactites and stalagmites. Stalactites are the ones that "stick tight" to the ceiling,

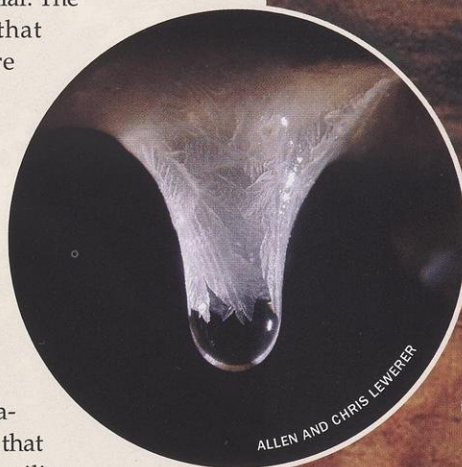
while stalagmites build up from the cave floor. These deposits of calcite are concentrated along cracks where the water drips through the rock and dries out. In fact these formations are often referred to as drip stones or flow stones. They form much as an icicle does in the winter, constantly dripping and leaving a little more calcite to crystallize.

Another type of speleothem is known as onyx, Fiske says, "Onyx is a highly crystallized form of rehardened limestone that covers the ceilings and formations in a cave and can sometimes be several inches thick. It begins as a liquid solution and attaches itself to rock as it dries out. It is a lot harder and more glass-like than normal limestone, so the formations often appear very different from usual, as if they have been coated with milky glass."

There are also "popcorn" speleothems, small formations made from drippings or splashing liquid on the floors. Where lots of these little bubble growths are clustered next to each other, it does look like popcorn.

Caving offers an interesting mix of exercise, exploration, natural history and cultural history. It provides an underground window into the recent past, several thousand years of human history and geological timespans.

A group of soda straw speleothems that may someday become stalactites.

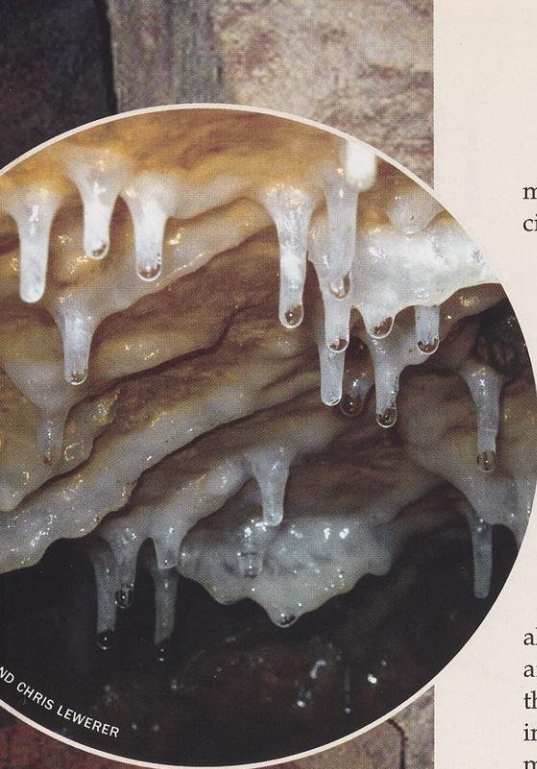


ALLEN AND CHRIS LEWIS

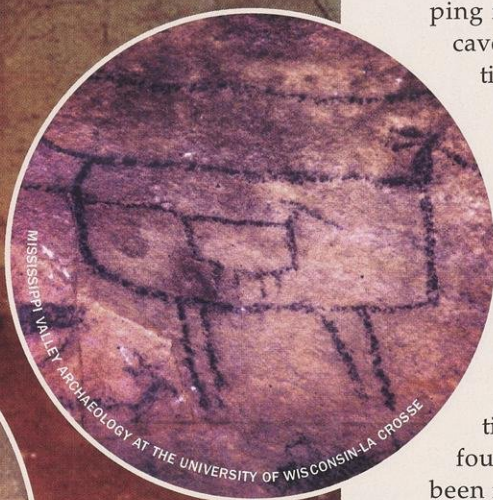
Water seeping through limestone dissolves it. Drops slowly form hollow tubes, called soda straws, over hundreds and thousands of years as calcite (calcium carbonate or calcium sulfate) precipitates and crystallizes on the outside from the water that drips within. These can grow several meters long.



Cavers squeeze through small passages under wet, dark, drippy and dirty conditions as they explore, but that is part of the fun!



ND CHRIS LEWERER



MISSISSIPPI VALLEY ARCHAEOLOGY AT THE UNIVERSITY OF WISCONSIN-LA CROSSE

Dry sandstone caves in Wisconsin house national cultural treasures. This Native American drawing of a pregnant deer is from a cave site in Wisconsin's Driftless Area. It's a close-up from a larger drawing depicting a late winter hunting scene. The painting likely dates to the Late Woodland Effigy Mound Culture, approximately A.D. 950.

Some caves also have box-work formations. These are thin blades of calcite that hang from the ceilings or stick out from the walls. They go every which way making a honeycomb pattern. The blades can intersect at various angles forming boxes, hence the name. Wind Cave in South Dakota is one of the best examples of this, but box-work formations also are found in Wisconsin caves.

Only about 250 sandstone caves have been recorded and mapped in the state. Sandstone caves also are usually cool in temperature, but they are dry and are generally much smaller than their limestone cousins. The longest one in the state is 100 meters in length, but most are tiny by comparison. Sandstone caves are usually barren and lack the more typical cave formations because they don't have mineral-rich water dripping from the ceiling. Some of these caves were formed through dissolution, but most were formed by running water and wind erosion centuries ago.

Sandstone caves were used by Native Americans as places to live and visit. We can tell from the excavations of sandstone caves and rock shelters, that Native Americans spent their winters in and around these caves that provided protection from the elements. Deer bones found at these sites have definitely been identified as animals that were killed in the winter. Additional evidence comes from etchings made in the sides of the soft sandstone walls of these caves. Pictures of buffalo illustrate a life of nomadic people, tribes that would head west into Iowa and southern Minnesota to hunt buffalo and then return to the fertile Wisconsin river valleys for the winter.

The presence of abstract art on some cave walls suggests that these spaces may have been used in summer for ceremonial purposes such as a youth's "vision quest" or part of a rite of passage.

Archaeologists also have found a cave with a drawing of a human figure with zigzag lines coming from his head. It is thought this is a picture of a storyteller,

perhaps recounting the buffalo hunt depicted on the other side of the cave.

Adventure seekers

Maybe we've piqued your interest to start exploring caves in your area. Like many other outdoor sports you should do your homework before you go. Start by getting in shape, getting some training and exploring well-established, larger caves in the company of experienced cavers. Know where you are going, find out if you need permission, tell someone where you are going, take along plenty of water, flashlights, a helmet — anything you need to be safe. It has been a while since Wisconsin has had someone lost in a cave, so make sure you aren't the next.

Dos and don'ts

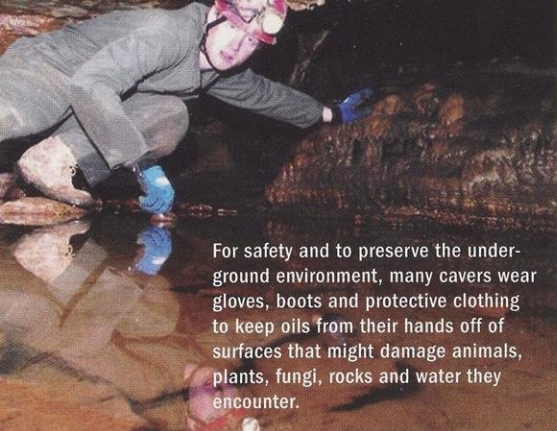
The cardinal rule is: never explore a cave alone. The minimum size of a caving group as recommended by the Wisconsin Speleological Society is four. The logic is that if one person gets hurt, one can remain with the victim while the other two go for help, with one of those two returning with emergency supplies while the other waits for rescue personnel. Even if you are with a larger group, don't go off on your own. And make sure you have left explicit directions as to where you are going and when you expect to return.

Next you will want to bring light. This can be in the form of a head light, flashlight or carbide light.

Go slowly. Remember that hiking and climbing can be strenuous. You should also be aware that you can chill quickly. Be prepared. Spelunking is usually a dirty and rugged venture, so consider head protection, gloves, knee pads and a light jacket. When your adventure is over, you will likely want a change of clothes.

What if something goes wrong? If you find yourself lost in a cave, just sit down and wait. Soon people will start to look for you. Wandering around a cave will only make rescue more difficult for everyone involved.

Another consideration is bat droppings. Many of these caves also are



For safety and to preserve the underground environment, many cavers wear gloves, boots and protective clothing to keep oils from their hands off of surfaces that might damage animals, plants, fungi, rocks and water they encounter.

DAVID THOMPSON

home to bats. Bat feces often contain salmonella, a bacteria that can affect humans. Make sure you wash your hands and face before eating and be aware that the bacteria might also be on your clothes. Don't wash your hands and then dry them on your pants.

Be respectful of cave walls that protect both natural and cultural treasures. Do not touch or write on cave walls. Don't ruin the experience for those who will come after you. The same is true of garbage. Pack out absolutely everything that you pack in.

Also, never ever take cave formations home and never touch any of these ancient art forms. If you find broken speleothems, leave them where they are and report them to archaeologists. These structures have taken centuries to form and can provide important information to historians and scientists.

Never collect wild plants and animals from caves. Because these sites are such a rare habitat, these creatures may only exist in small numbers. Taking moths, bats, reptiles, etc., out of these caves could have disastrous effects on their populations.

And finally, bring common sense. Avoid drugs and alcohol. Caves can be dangerous enough without adding stupidity. Stick together as a group. Avoid playing pranks.

Why are people cavers?

Caving is fun for kids and adults alike. Fiske says, "I guess my interest in caving stems from my own family outings as a child. At least once a year, my parents would take our family to a commercial cave for a day. I carried on with that tradition with my own family and took it one step further and got involved in wild caving and exploring non-commercial caves."

Public limestone

The best places to experience caves for the first time. If you've experienced these, you can join the Wisconsin Cave Club. Here are some of the best known public caves.

Crystal Cave, Spring Valley

According to the history books, Crystal Cave was discovered in Spring Valley in 1881 by a local farm boy, William R. Vanasse. The discovery occurred while William was walking through the woods just a short distance from his home. The 16-year-old, discovering a small leaf-filled sink, probed and pushed with a stick which suddenly slipped from his grasp, disappearing into the ground. Initial exploration of the cave took place the next day when William and his younger brother, George, descended into the large vertical entrance. They entered a clay- and debris-filled dome from which they then dropped down into what is now the main room of the second of three levels. Over the decades, this cave was excavated, exposing larger rooms and caverns. Two details that separate Crystal Cave from the others are that it is home to four bat species, and the limestone and dolomite were deposited one layer at a time giving it a layer cake appearance. The cave is the oldest known natural cave in Wisconsin. www.acoolcave.com, 1-800-236-2283.

Kickapoo Indian Caverns, Wauzeka

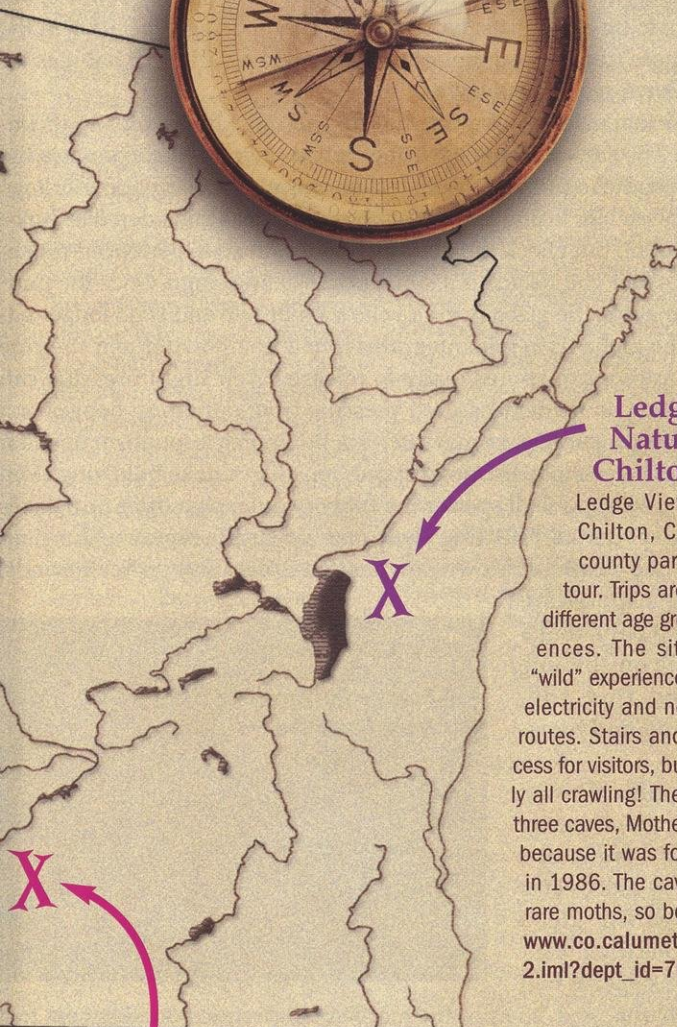
This limestone cave in Crawford County between Boscobel and Prairie du Chien is an exception to the rule in that it was once a Native American shelter. It boasts underground caverns, an underground river, and onyx deposits. It closed to public visits in the 2007 season and may or may not be available for visits in the future. www.kickapooindiancaverns.com.

Eagle Cave, Blue River, Wisconsin

This cave in southwestern Wisconsin (northeastern corner of Grant County, west of Muscoda off Highway 60) was discovered in 1849 by two hunters chasing a bear in winter. The entrance was easy to find and soon others came to the cave. It is considered the state's largest onyx cave with several large rooms and formations. In 1937 local businessmen got permission to open the cave as the first public cave attraction in Wisconsin. Enthusiasm for the cave still exists. In fact, several boy and girl scout groups use it for camping as it can accommodate more than 250 in the entrance hall. Contact the cave operators for details. Tours are offered Memorial Day through Labor Day. Eagle Cave, 16320 Cavern Lane, Blue River, WI 53518, (608) 537-2988 www.eagle-cave.net.

caves

ne are the caves open to the public. After you've
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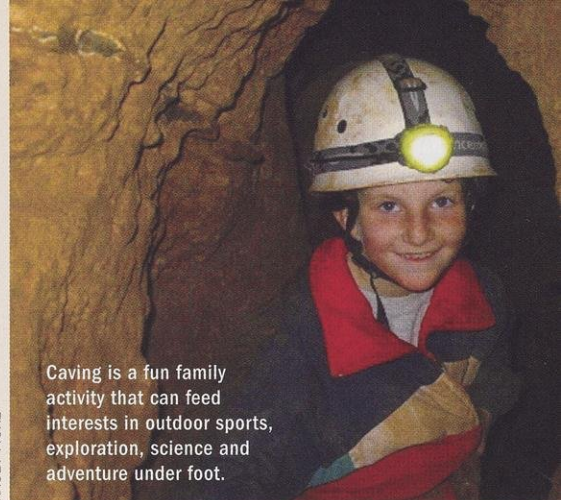


Ledge View Nature Center, Chilton

Ledge View Nature Center in Chilton, Calumet County, is a county park with three caves to tour. Trips are geared to introduce different age groups to caving experiences. The site provides a more "wild" experience because there is no electricity and no concrete along the routes. Stairs and ladders provide access for visitors, but this cave is basically all crawling! The most notable of the three caves, Mother's Cave, is so named because it was found on Mother's Day in 1986. The caves are also home to rare moths, so be sure to tread lightly. www.co.calumet.wi.us/departments2.iml?dept_id=70, (920) 849-7094.

Cave of the Mounds, Blue Mounds

Of the caves in Wisconsin, perhaps the best known is Cave of the Mounds near Blue Mounds in South Central Wisconsin. This cave was discovered in 1939 by workers quarrying limestone. A large blast unearthed an underground cavern. The initial opening was more than 20 feet high and led into other rooms. Soon word got out and people started to travel to see the great cavern. In 1940, lights and walkways were installed and it was opened to the public. The main cavern is believed to be over 400 million years old and was shaped over the years by acidic water and dissolved limestone. www.caveofthemounds.com, (608) 437-3038.



KASEY FISKE

Caving is a fun family activity that can feed interests in outdoor sports, exploration, science and adventure under foot.

There is a whole culture of adults who go caving in Wisconsin not to mention college campus groups like the Wisconsin Hoofers who plan cave explorations.

"The cavers in Wisconsin are a varied group of individuals," says Fiske. "The thing that binds us together is the draw of the unknown, the thrill of exploration, and the knowledge that you may someday stumble on a new discovery that no other human being has seen before. Cave exploration to all of us is comparable to walking on the moon."

Cave exploration has its dark side as well. Rare rock and cave art has unfortunately become the target of would-be thieves and vandals. Late in 2004, a 1,000-year-old rock painting was defaced with spray paint at Roche-A-Cri State Park. Vandals tried to saw out an ancient rock painting at Gottschall rock shelter in Iowa County back in 1994 and just last August, vandals scratched their initials into a cave painting at a historic rock shelter in Larsen Cave near Eastman northeast of Prairie du Chien.

Since 1996, state law set felony penalties of up to 3½ years imprisonment and



ALLEN AND CHRIS LEWIS

Cavers enjoy getting together for an overnight trip to Fuzzy Critter Cave at Crystal Cave in Spring Valley.

An eastern pipistrelle bat at home in a cave. Cavers are careful to avoid critical habitat for bats especially when the mammals are vulnerable in the fall and winter.

ALLEN AND CHRIS LEWERER



fines of up to \$10,000 for damaging antiquities like rock art. Archaeologists across the Midwest work to educate the public about these priceless remnants of past cultures, but are hesitant to describe exact locations for fear of future theft and vandalism. Protecting and patrolling a host of shelters and sites may be prohibitively expensive. Many caves that provide rare habitat for bats and other animal and plant species just can't preserve those natural features and accommodate human visitation.

One of the three largest bat hibernation sites in North America is an old mine near Iron Ridge in Dodge County, now preserved as the Neda Mine Bat Sanctuary. The old iron mine, abandoned in 1914, was donated to the University of Wisconsin-Milwaukee in 1975. More than four miles of tunnels in the mine maintain a constant 40°F temperature year-round and it's home to more than 500,000 bats that migrate here from at least a four-state region. Extensive research takes place here and the site has been protected with gates to keep the curious from disturbing the fragile bat habitat and its winter inhabitants.

Reputable, respectful cavers are part of the solution to human intervention problems. They show people how and where caves can be explored and enjoyed without damaging the natural and cultural treasures in these rare places.

To learn more about caving in Wisconsin, visit the Wisconsin Speleological Society website at (www.caves.org/grotto/wss) and click on the caving links icon. To read about archaeological sites and research in the southwestern Wisconsin caves, visit www.uwlax.edu/MVAC/SpecificSites/Deep%20Cave.htm, the home of the Mississippi Valley Archaeological Center at the University of Wisconsin-La Crosse. Check out the Minnesota Speleological Survey at www.mss-caving.org



Writer Judy Nugent also hosts Outdoors Radio with Dan Small and Judy Nugent and produces feature segments for WMVS-TV's Outdoor Wisconsin show.

Smoke from a bald giant

continued from page 2

Taxonomically, puffballs belong to the fungi order Gasteromycetes and the family Lycoperdales. *Gastero* means stomach, alluding to its defining feature, and all members of this order produce their spores completely within a fruiting body. More typical gilled mushrooms produce their spores exposed to the air so they can drop when mature. Several puffball species populate Wisconsin ranging in size from the tinier walnut-sized individuals to this huge one appropriately called *Calvatia gigantea*, the bald giant.

The puffball part is the fruiting body or the visible portion of a fungal colony. For most of the year, the fungus remains undetected, thriving underground and taking nourishment from decaying matter. For a few days each year, the fungus sends up this fruiting body, which is the spore-producing stage of its life cycle. Some mushrooms only grow on specific substrates, but puffballs seem to be generalists that grow on decomposing vegetation in the soil. They appear from late summer into autumn in a variety of habitats including meadows, woods and lawns.

This mushroom emerges as a tiny button and quickly expands to its impressive size. The smooth outer covering, called the peridium, protects the fertile, spore-producing tissue (gleba) inside. During this early growth stage when it is snow-white inside and out with no stalk, it's considered a choice edible mushroom, but check the identification with an experienced mushroom picker before you decide if it's in a prime eating stage. Once the puffball starts to mature, the gleba turns a yellowish-brown and is no longer edible. In fact the gleba tissue disintegrates into a fine powder and the ripe puffball has millions of spores ready to release. Even slight pressure can send them sailing on the wind. Gentle pressure from raindrops, hooves or a gentle pinch from a passing animal can force the spores through an opening in the top called an ostiole. Escaping spores look like smoke billowing from a chimney. On other puffball species the rubbery outer skin dries out, flakes away and the spores start floating away on even gentle breezes. The giant "puffs" out a fine yellowish-brown powder that drifts away on fickle winds.

Millions of the spores are released in the hope that a few will settle on suitable substrate and find adequate nutrition and moisture to grow.

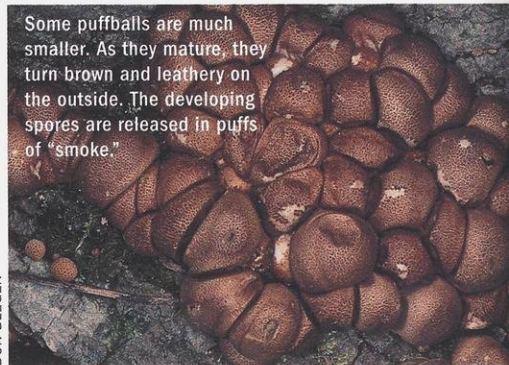
My giant puffball never made it to the mature stage intact. A few days later I dissected it to discover a spongy brownish gleba with a really earthy mushroom odor. The spores had not completely matured, so I put the marvelous specimen outside next to a pile of sticks. When I checked a week later, the smooth covering had turned gray and dried to a papery texture. Spores wafted away in mustardy clouds. I wondered if I will have a yard full of these giant puffballs next year. We'll just have to wait and see.

Oh how I wished I had discovered a puffball for myself on one of my outings. In all my years of exploration, I've never found one or been at the right place at the right time. I keep hoping that if the bald giant sprouts on the landscape, I can take a closer look and my prize will earn a well-deserved WOW! from others who discover it too.



Some puffballs are much smaller. As they mature, they turn brown and leathery on the outside. The developing spores are released in puffs of "smoke."

DON BLEGEN



Anita Carpenter searches out the tiny and gigantic, the long and the short of it on walks near her Oshkosh home.

Readers Write

COMMENT ON A STORY?

Send your letters to: Readers Write, WNR magazine, P.O. Box 7921, Madison, WI 53707 or e-mail letters to david.sperling@wisconsin.gov

WERE THE BATS MIGRATING?

About 15 years ago, I bought the few acres and house that were left of a farm here in Oak Creek. The land was very close to a lake and bordered a wood that was perhaps five acres at the most. One morning about 4:00 - 5:00 I was sitting on the steps to the house when I began to hear muffled chirping-like sounds coming from a large evergreen tree between me and the road. Upon further inspection I saw that the tree was really loaded with thousands of bats. By the time I returned home from work early that evening, I passed up the tree without a glance. It was maybe mid-May and I have assumed they were migrating. Was my seeing the migration a real unusual event? What would you guess was happening?

Kieran J. Sawyer, Sr.
Oak Creek

DNR Bat Ecologist Dave Redell responds:

What you witnessed is an event that I am always on the lookout for, though have yet to observe first-hand, a tree full of bats in Wisconsin. The question is whether it is a rare event, a rare observation, or an occurrence that is rarely reported. It is likely a combination of all three.

Of seven species of bats known to regularly occur at some time during their natural history cycle in Wisconsin, the hoary bat, Eastern red bat and silver-haired bat stand out as the usual suspects. That is, these three species are considered foliage-roosting, or tree bats, that migrate south in the fall to

warmer climates for the winter months, then return during spring migration to summer grounds where they will raise their young. In the summer, these species are often found as solitary individuals or in relatively small groups, but they have been reported to migrate together in larger groups later in the season. For example, in the late 1800s a naturalist reported "great flights of red bats during the whole day," though reports such as that were rarely observed or reported after the early 1900s. Likely, declines in numbers of these bats have occurred due to changes in forest and land use patterns during the past 150 years.

Compared to bird migration, we know very little regarding the behavior, timing and roost site selection at stopover sites during bat migration. It is possible that the same locations are used year after year as these bats make their way north and south during migration. Most of the reports that I have heard of involved far less than even 100 bats in a single tree. While estimating numbers is a difficult task, even for trained biologists, if there truly were thousands or even hundreds of bats in a tree it would be an unusual event worth documenting. Actually, I'd be interested in documenting reports for Wisconsin of any of the three species of tree bats found roosting at any time and in any number. If you or any of the other readers come across any of these bats roosting in trees, be sure to record the observer, location, date, time, along with a photograph of the bat or bats for later verification and identification of species. Given more reports, we can verify the species, date, and detailed location (including

species of tree or shrub used). This combined information will increase our understanding of the behavior, timing and habitat requirements needed to conserve these bat species in Wisconsin. Thank you for the letter, it was obviously a memorable event for you even 15 years after it occurred.

KARNERS IN THE COULEES?

I was intrigued by the Karner blue article ... I grew up near Stevens Point, and jack pines interspersed with lupines were quite common there. I thought it worth mentioning that in Pierce County where I now live, one may also see the occasional stand of jack pines and lupines. Usually they can be found on sandy bluff sides in the coulees. I did not see Pierce County included on the Karner blue's range map, but it is quite possible they are present here. Now that I know lupine is their host plant, I will keep an eye out for them. Thanks for a great magazine!

Brent Hopkins
Elmwood

KARNER ID CHECK

I have been interested in insects since my 4-H days and was impressed by the June article on the Karner blue butterfly. The map provided us with a starting point on our trip to find the Karner in Northern Wisconsin. We traveled on Highway 12 near Millston and found one area with about a dozen Karners.

I do have one question. I looked at other photos of Karner blues from several sources and it appears that the photo of a male Karner blue on page 19

of your story is actually a female rather than a male. Is the identification correct? Thanks again for the article as I would never have seen this beautiful little butterfly in person without this story!

Robert John Ault
Monroe

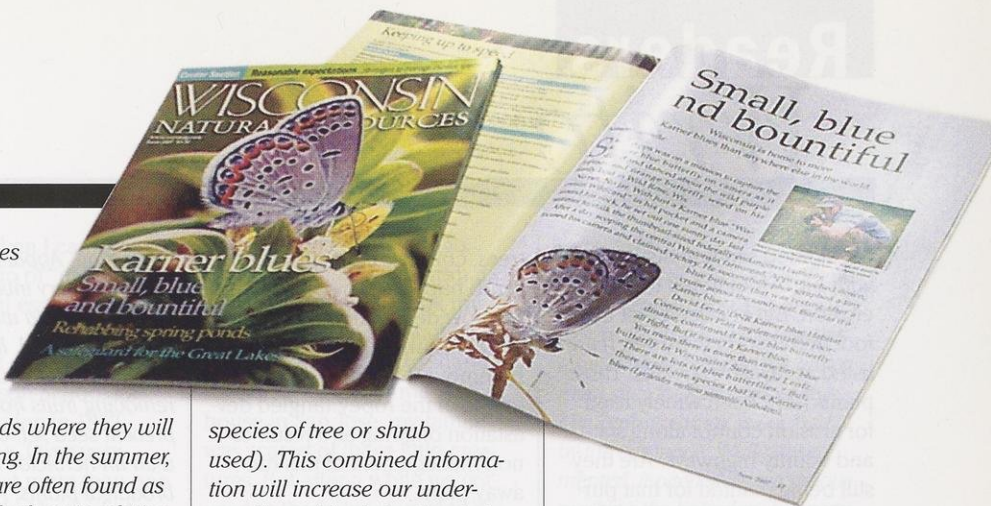


THOMAS A. MEYER

You are right. The photo shown was a female Karner. Here is what a male Karner blue looks like from the top side looking down.

PLANT CHOICES FOR SEEDING COVER

The June articles concerning invasive species are of special interest to me. I am a Master Gardener and enjoy reading anything about plants. My husband and I are planning to landscape our lawn entirely with native species surrounding our new home. We have also recently bulldozed a road through one of our wooded 40s under the Managed Forest Law. The road will be used for logging as well as recreational use. I had



Readers Write

considered seeding the road with bird's-foot trefoil to control erosion. But I noticed that bird's-foot trefoil and crown vetch are listed as invasive species. Those plants have been widely used for erosion control along state and county highways. Are they still being planted for that purpose? If not, what ground cover is used and what would be a good ground cover for our woods road?

Margie Novak
Kennan

Northern Region Ecologist
Ryan Magana responds:

Bird's-foot trefoil and crown vetch are extremely invasive plant species and should not be planted in any erosion control project. Although they are both proficient at holding soil and preventing erosion, both have a tendency to grow far beyond the areas where they are planted and cause ecological disruptions in the habitats where they spread. As an alternative, I'd suggest the following seed mix that will be effective in preventing erosion and should not cause the same problems as bird's-foot trefoil or crown vetch: Mix white Dutch clover at 8 lbs./acre with perennial rye grass at 5 lbs./acre and annual rye grass at 8 lbs./acre. Mix seed, spread, rake in and keep lightly watered until established.

CURBING WILD CUCUMBER

I was stunned that your June article "Sentinels to sound the alarm" included porcelain berry and kudzu, but not wild cucumber vine. This destructive and aggressive plant is rampant in urban, suburban and wooded land in most green areas of the upper US. (I have actually seen it in France, as well!) In our Milwaukee area community, in just the past two years, at least four huge pines, several mature

trees, countless low shrubs and scrub have been overtaken and are now dead. The fence along the Milwaukee County Zoo (on Bluemound Road) is a small example of the ropery, tangled devastation ongoing as a result of non-management of this runaway plant.

My concerns, shared with local municipalities and the DNR, have met with counter comments about purple loosestrife and garlic mustard. Last time I looked, these weeds were not killing full grown trees and entire half miles of wooded areas along the roadside all over our state.

At the least, I would suggest advising property owners to be aware of this harmful element in their own surroundings. They might be encouraged to take steps to curtail some of the ambitious destruction caused by this obtrusive and decimating vegetation.

Mary H. Lopez
Elm Grove

Native Plant Ecologist S. Kelly Kearns responds:

Thanks for your note on cucumber vine. The article you are referring to was specifically limited to plants that are not yet widespread in Wisconsin, but are invasive elsewhere and have the potential to become quite invasive here. Certainly there are many other species that are already widespread that were purposefully not included in the article.

Two species of vines are referred to as "wild cucumber." I suspect the one you are concerned about is Echinocystis lobata. It is a native wetland annual vine that can be quite aggressive in disturbed wet soils. I have had a few questions about it over the years, and have seen somewhat large populations blanketing other

vegetation. Apparently it is becoming a very invasive pest in parts of Eurasia where it has been introduced. It can be controlled by pulling up the vines, removing fruits from the vines to prevent seed set, or spraying with an herbicide that kills broadleaf plants. As far as I know there has not been any research on control methods and I don't know of any herbicide specifically labeled for it. We are working on developing fact sheets on various species, and this may be one of the aggressive natives we should address with a fact sheet.

BEHIND THE PATTISON

Thank you for printing the poignant, beautifully written article by Roger Drayna. His story, evoking memories long forgotten, became my story, the setting — vastly different — played out in the backyards of friends from PS 51 in Queens, NY. There were no great blue herons or bald eagles. But, there was time to explore. Time to crawl around Beebee Finnegan's backyard and the underbrush next to her long driveway, to plan houses made of acorn tops

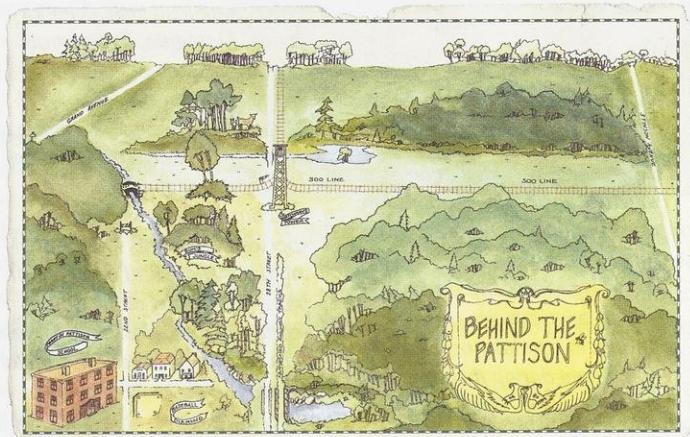
and little boxes with leaves for make-believe critters. And on trips to the Brooklyn shore, there was time to explore the dunes and the sand crabs that made such swift escapes in the receding waves.

I am afraid that we have lost more than the woods behind the Pattison, we have lost the childhood that was possible in those wild and not-so-wild places. Play was organized by children, not adults. Children made the rules and were able to take risks. We did not live in fear, yet there were fearful places.

There are still wild places, both big and small, but my question is do we give children the time and freedom to find and make them their own?

Linda Pils
Madison

I grew up in the '50s and '60s and had similar experiences in La Crosse. As I get older, I don't take for granted all the things we had and still have right here. It might be a Midwest experience with old-fashioned values to learn to entertain ourselves



Elizabeth Cavanaugh drew several full-color illustrations for our "Behind the Pattison" story that you can see on our website with the August issue at www.wnrmag.com.

with the simple things in life. We spent Saturdays hiking and exploring, having cookouts on the bluffs overlooking town and the La Crosse River marsh. We took along our BB guns, re-curve bows and sometimes a dog. Our group was also in Scouts together, and these outings gave us a chance to learn some advanced wood lore, camp and canoe on the Black River.

Our dads didn't have the time they would have liked to do things with us because they were often working on the weekend to support and raise their families. As we got older, we ranged farther with our prized 22s and talked of great adventures with guys like Fred Bear, whom we read about in magazines. When we got even older and could drive cars, our escapades took us far into the Coulee Region, blufflands and the great Upper Mississippi and bottom lands. A lot of the guys moved far and wide for job opportunities except for two of us who knew we had to stay. Over the years in the outdoors we accomplished many of the hunting, fishing and trapping things we read about in those magazines. We've traveled to the Rockies, the Great Plains and to Alaska above the Arctic Circle but always came back to admire the upper Mississippi area.

I hope that future generations both have and appreciate places like this. There are those who would like to develop these areas, and a lot of people could become wealthier in the process, but at a great permanent loss.

John Papenfuss
Onalaska

What a wonderful surprise to leisurely page through the

August issue when I came across the photo of "my school" in the delightful essay "Behind the Pattison."

I taught first and second graders at Pattison School for 25 years, beginning in 1962. During that time, I was very much aware that more than one neighborhood kid had a fort or a hide-out behind the school. I recall hearing of many childhood adventures from "Behind the Pattison."

In spring, I, myself would venture behind the school to catch tadpoles for science class.

We readers, who were fortunate enough to have our own special places as children, most certainly can relate to Mr. Drayna's recollections. Hopefully, there will always be those "wild places" for childhood adventures and exploration.

Bev Engstrom
Rhinelanders

"Behind the Pattison" brought back memories of my youth in Superior. I lived at 1118 Harrison St. for my first 18 years. I attended McCaskill Elementary School in the early years but had many friends during those years who attended Pattison, and who are going to enjoy your story. I was one of those "explorers" in the area described as well as the larger area south of 28th Street and east of Tower Avenue. The City of Superior had planned for considerable expansion and we found new fire hydrants installed among the alder brush as well as many forms of wildlife. Now, those memories are seventy-odd years old.

Jim Calhoun
Clearwater, Fla.

A LONG-LEGGED SPIDER BESIDE HER

Here is a long-legged home spider (a harvestman) which showed up in our bedroom

sink a couple of nights ago, hanging upside down from a newly woven web. I took this close-up shot and thought it might be interesting to share.

When we first came to this house in San Jose, my family was scared of these little creatures. But after a while we got used to them, we started to rescue them from harm's way, such as falling in the bottom of the bath tubs. Theirs is such a small world confined to a corner of a ceiling with no notion of an outside world. It makes you wonder how much bigger our own world may be beyond what we can see and imagine.

The spider's face has a couple of bubbles on the head. The face is so vividly human-like that one can not help but staring at it as if it could comprehend us. Who knows, these little fellows may just be monitoring us in our most intimate times.

Moe
San Jose, Calif.



Anita Carpenter responds:

Greetings from Oshkosh, Wis.! As the author of the article on daddy long legs, I can tell you for certain that your friend in the sink is a spider, not a daddy long legs or harvestman. Spiders have two body segments — the cephalothorax and the abdomen — not three segments like insects. The two segments are connected by a narrow stem

or pedicel.

Segment 1, the cephalothorax combines the head and the thorax. This segment bears the eyes, mouthparts and the attachment sites for four pairs of legs. The cephalothorax is covered by the carapace. While unsegmented, it often shows a groove marking the boundary between the head and the thoracic region, giving the appearance of two body segments.

Segment 2 is the abdomen.

Daddy long legs lack the pedicel between the two body segments and resemble a split green pea with long legs.

Let's take a closer look at the great photo you sent. The photo clearly shows three distinct body segments. The spider belongs to the family Pholcidae whose very long, flexible legs are a characteristic of this family. The members of this family are frequently confused with daddy long legs because both have very long, flexible legs.

These spiders also hang upside down beneath the web, as you described. We have these spiders in our garage and I find them fascinating to watch. If you gently touch their web, the spider will vibrate the web very rapidly. The purpose of this is to

ensnare a potential meal in the web. Every year I touch a web, just to watch this display. We let the spiders live. Eventually you may even see the female holding her marble-size sac of eggs. These spiders are beneficial and will not bite.

Thanks for your interest in taking a closer look. Now I must go into the garage to see if I can find my spider friends!







Politics and four-legged bedfellows

A personal side to the presidential candidates







According to *Political Insider*, a collection of stories from the leading newspapers and news sources, and a poll conducted with the candidates by the Associated Press, here's a list of presidential candidates and their pets:



DEMOCRATS

-  Hillary Clinton owns a chocolate lab named Seamus.
-  Bill Richardson has two tabby cats, Jackie and Squeaky.
-  John Edwards has a golden retriever and a chocolate lab.
-  Dennis Kucinich has a beagle-basset named Harry, a beagle named Lucie and a cocker spaniel named George.
-  Joe Biden has a cat.
-  Chris Dodd and Barack Obama have no pets, though Obama has promised his kids a dog.

REPUBLICANS

-  Mike Huckabee has a hunting dog, Jet, and a shih tzu, Sonic.
-  Mitt Romney's wife owns horses.
-  Sam Brownback has his two cats, a lab/blue heeler mix named Twinkle, a miniature dachshund, Emma and a fish named Marvin Three.
-  John McCain owns three turtles, three parakeets, a ferret, two dogs (Sam, an English springer spaniel and Coco, a mutt), a cat and 13 saltwater fish.
-  Duncan Hunter has two black labs named Boo and Hunter.
-  Rudy Giuliani, Tom Tancredo and Mitt Romney have no pets.

Pets with paunches

A recent report by the National Academy of Sciences' National Research Council indicates that about 25 percent of cats and dogs in the United States are obese. That should be a concern for pet owners since being overweight predisposes your pet to health risks including:

- Heat stress
- Increased risk of diabetes
- Digestive problems
- Heart, liver and breathing problems

While heredity or hormonal disorders may cause obesity in some pets, diet and exercise also may be factors. That's why it is best to work with your veterinarian to determine the cause of obesity in your pet and to monitor your pet's diet and make changes to lower-calorie foods as needed. And remember that people food is just that — for people. Sharing scraps from the Thanksgiving feast might seem sweet but those extra table treats can lead to serious health concerns down the road. Keep pets on a consistent healthy diet in moderate quantities and exercise them regularly to promote good health.

Bagging birds with your buddy

Train your dog from a pup on up to be steady and comfortable in a boat.






ROBERT QUEEN

If you typically use a boat to hunt waterfowl, it's best to introduce your dog to the skiff, the blind and firearm noise before trying to bag or retrieve a bird on the water. Dogs that are miserable in a boat can get out of control and even cause the boat to capsize. It's important to teach your dog to lie down in an assigned place in the boat and to stay there until it is commanded to retrieve. The more a dog gets accustomed to the boat — including getting into and out of the boat — the more comfortable it will become. If you don't have access to water, start by training your dog in a boat on dry land.

Black cats and bats

Halloween can be especially scary for pets. Costumed strangers coming to the door trading tricks for treats can be confusing and upsetting. Jack-o'-lanterns aflame near a window give off odors and present fire danger. A pet owner's passion to dress cats and dogs in cute costumes can be downright deadly if the costumes restrict breathing.

-  To keep your pet safe during the holiday, make sure Halloween treats are kept out of reach. Some candy can be poisonous to pets and wrappers may be hazardous if swallowed.
-  Consider keeping your pet in a room away from the door and the doorbell to provide some distance between trick-or-treaters and your pet.
-  Keep pumpkins out of the way of curious pets. A pet may knock over a pumpkin during play or prowling and start a fire. Never leave lit pumpkins unattended.



Wisconsin Traveler

I'm pumped!

Surely there is no more celebrated member of the cucurbit family than the Wisconsin pumpkin. Yes, those who favor quantity over quality stoutly proclaim the virtues of the prolific zucchini, while the warty, mottled exteriors of those garish ornamental gourds hold an attraction for the untutored eye. But it is the pumpkin that reigns above all squash. Indeed, the following attempt to compile a short list of pumpkin-related events was nearly thwarted by the sheer number of festivals hosted in its honor this month. We plucked just a few from the patch; rest assured that all will provide plenty of good food, music and fun:

OCTOBER 6



Thorp Pumpkin Fest —

Pumpkin baking, carving, painting and weighing anchor this one-day squash party in Clark County. www.clark-cty-wi.org



Fremont Pumpkin Festival —

Waupaca County welcomes your participation in a pumpkin bakeoff and scarecrow contest. www.visitwaupacacounty.com

OCTOBER 6 & 7



Nekoosa Giant Pumpkin Festival —

The folks in Nekoosa always find creative ways to boost the pumpkin's already-elevated profile. Join the Pumpkin Boat Regatta (see how long you can stay afloat on a giant pumpkin watercraft) or take part in the nationally-renowned Cata-Pumpkin Launch, in which competitors use home-made catapults to fling a 10-pound pumpkin. www.nekoosagiantpumpkinfest.com



Pumpkin Patch Festival

— Step aside, cherries. Egg Harbor aims to promote the pumpkin during its two-day celebration featuring scarecrow and pumpkin displays throughout town, a farmer's market and more. www.eggharbordoorcounty.com



OCTOBER 13



Great Pumpkin Extravaganza Arts & Crafts Festival —

Main Street in downtown Weyauwega in Waupaca County goes ga-ga for the grandiose squash. www.weyauwega-chamber.com



Milltown Pumpkin Fest

— Pumpkin bowling Polk County-style, plus bed races, a rope pull, and free pumpkins to kids under 12. www.milltown-wi.com



Pumpkin Fest —

Sample delicious home-made soups and other pumpkin delights in Three Lakes, "The Jewel of the Nicolet" National Forest. www.threelakes.com



NEKOOSA GIANT PUMPKIN FEST



HEATHER WOLF

OCTOBER 27



Pumpkinfest —

Line up your carved or decorated pumpkin along the Wisconsin River Levee in Portage and help the city set a world record. www.portagewi.com



Grand Pumpkin Illumination —

Hundreds of carved pumpkins will be on display in Delafield, and when they're all lit up you're sure to be spooked. www.delafieldchamber.org



Pumpkin Walk & Haunted Hayride —

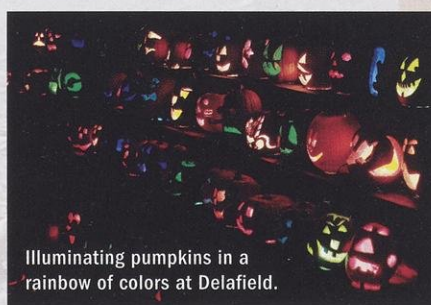
Glowing jack-o'-lanterns light the way along a mile-long trail at Roche-A-Cri State Park in Friendship. (608) 565-2789



The Great Pumpkin Hike —

High Cliff State Park in Sherwood hosts its annual nighttime squash stroll. (920) 989-1106

LEFT: Take in the pumpkin regatta.



LEFT: Roche-A-Cri State Park in Friendship holds a haunted hayride and a mile-long walk with pumpkin night lights!

PUMPKINS ON THE RAILS

Pumpkins are so popular, they even have their own transportation. Go along for the ride!



The Great Pumpkin Train

plies a route from the National Railroad Museum in Green Bay to a pumpkin patch on October 13-14. (920) 437-7623 www.nationalrrmuseum.org



Ride the Pumpkin Special at the Mid-

Continent Railway Museum in North Freedom, October 20-21. The conductor will help you load your pumpkin on the train for the return trip. (800) 930-1385. www.midcontinent.org



Travel from Spooner to the Great Pumpkin Patch on the Wisconsin Great Northern Railroad's **Great Pumpkin Train** every Saturday and Sunday in October. (715) 635-3200. www.spoonertrainride.com

PICK OF THE PATCH

Looking for a list of pumpkin picking patches and haunted events statewide? Check out Haunted Wisconsin, www.hauntedwisconsin.com

wisconsin.com/pumpkins/pumpkins_html

Wisconsin, naturally

BATTLE BLUFF PRAIRIE STATE NATURAL AREA

Notable: Battle Bluff Prairie is an exceptionally steep dry "goat" prairie on a prominent bluff rising nearly 500' above the Mississippi River. Fall color is provided by the many asters, goldenrods and native grasses that turn color as the days shorten. The natural area draws its name from a Black Hawk War skirmish fought nearby.

How to get there: From the junction of Highways 82 and 35 in DeSoto, go north on 35 for 2.7 miles, then east on Battle Hollow Rd. 0.25 miles. Park along the road and walk north. Visit dnr.wi.gov/org/land/er/sna/sna177.htm for a detailed map and access information for other parts of the area.



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