



## **Wisconsin natural resources. Vol. 27, No. 4 August 2003**

[Madison, Wisconsin]: Wisconsin Department of Natural Resources, August 2003

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# WISCONSIN NATURAL RESOURCES

A large elk with prominent antlers stands in a field, facing slightly left. The elk has a thick brown coat and a large, dark beard. The background is a soft-focus landscape with trees and grass.

August 2003 \$3.50

Elks'  
morning  
bugle call

A spreading  
concern over  
West Nile virus

Hunters get ready for  
dove season

Appreciate the  
bat patrol



# A world in a leaf

Tiny spiders weave a niche in a few square inches.

Leroy Lintereur

A leaf is always an object of interest, and I admire it as much as any flower. A leaf growing as it should is fine, but a leaf rolled, folded over or plastered to another is much better, a surprise package that might contain anything.

Well, not quite. It might be just a rolled up husk that contains nothing once the resident is long gone, leaving just a few strands of thread or perhaps the shred of a cocoon; mute evidence that the leaf was once the happy home of some animal.

No one need look far, particularly at this time of year, to find a leaf that is occupied. A caterpillar may be well on its way to becoming a moth, or maybe you'll find a colony of aphids, or above all, spiders.

These are not the big, dark creatures one sees scuttling along on the ground, or tucked away in some corner of the house. These are brightly colored. Some with a broad black stripe on white, rather like a skunk in reverse, others with an effect that can only be described as marble, and fine marble at that. Then there are those tinted with shades of emerald green, jet black or shades of blue. The combinations are endless and I cannot see why the butterflies and beetles have stolen the glory from them [as colorful insects] just because they are spiders. Most spiders are small, so tiny that you need a magnifying glass to bring out their color and form, and of course, you have to make a special effort to find them.

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The crab spiders occupy small spaces on leaves, flowers and in leaf litter. They are hunting spiders that capture their prey by scuttling forward, backward and sideways very quickly. They travel longer distances by sending up long, silky threads and ballooning.

(above) The Elegant crab spider (*Xysticus elegans*). (below left) *Misumena vatia*, an ambush spider lies in wait on a flower head. (middle) Many crab spiders can change color from whitish to yellow to match their background. (right) Some prefer to ambush their prey that can include flies and bees.



DON BLEGEN



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SCOTT NIELSEN



# WISCONSIN NATURAL RESOURCES

August 2003  
Volume 27, Number 4



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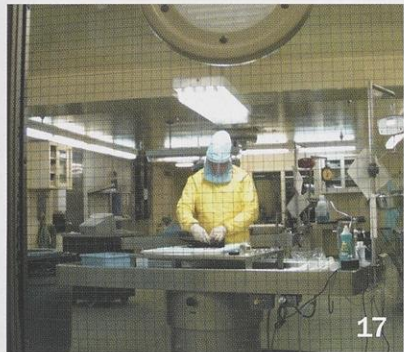
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FRONT COVER: Bull elk (*Cervus elaphus*) keep a watchful eye in late summer and fall for other bulls who would take their harem.

JERRY MERCIER, Madison, Wis.

BACK COVER: The summit of Observatory Hill State Natural Area, Marquette Co. 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 go to [www.dnr.state.wi.us/org/land/er/sna](http://www.dnr.state.wi.us/org/land/er/sna).

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JACK R. BARTHOLMAI

Editor David L. Sperling  
Associate Editor Natasha M. Kassulke  
Contributing Editor Maureen Mecozzi  
Circulation Manager Kathryn A. Kahler  
Business Manager Laurel Fisher Steffes  
Art Direction Nancy Warnecke, Moonlit Ink  
Printing Royle Printing



PUBLCE-012  
ISSN-0736-2277

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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Governor Jim Doyle

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# Up for the morning bugle call

The chance to hear elk sound off  
at sunrise is worth the trip.

*James C. Bishop, Jr.*

At first the visitors thought it was a setup, a put-on of sorts for good show. Laine Stowell, the DNR's elk biologist, had taken the group into the Chequamegon National Forest and called out to an unseen animal. Off in the distance, one answered back right on cue. The skeptical visitors wondered if another biologist was off in the woods mimicking the animal call





Bull elk bugle during the four- to six-week breeding period to note territory, synchronize estrus among the cow harem, and warn other males to stay away.

DAVID N. OLSEN. COURTESY OF ROCKY MOUNTAIN ELK FOUNDATION

or had flicked on a tape recording...then a bull elk with four-foot antlers came into view about 100 yards away. It walked another 20 yards toward the slack-jawed audience of wildlife watchers and a film crew. The 850-pound animal threw its immense head back and

echoed the biologist's call. Now the *elk* seemed a little uncertain. Who were these intruders in his territory?

The group witnessing this display last September was taking part in Bugle Days, sponsored by the Rocky Mountain Elk Foundation and the Depart-

ment of Natural Resources. Four couples had submitted winning bids at fund-raising auctions to take a guided trip to the Northwoods back country where elk were released just eight years ago.

Four of Wisconsin's 26 chapters of



the Rocky Mountain Elk Foundation hold Bugle Days raffles/auctions each year. The winners get these guided trips to hear and hopefully see elk in the Clam Lake area where Ashland, Bayfield and Sawyer counties meet.

Wisconsin has the most Rocky Mountain Elk Foundation chapters of any state. Four state chapters hold Bugle Days raffles to hear elk call during their rut.

Dick Pfister, long-time elk hunter from Hayward, won the trip for himself and Terry Dale. "She'd never heard an elk bugle and I wanted her to have the experience. There's nothing more exciting than having a big ol' bull talking at you," says Dick Pfister.

you," said Pfister. "She found the whole thing thrilling, especially when we saw and heard a second bull."

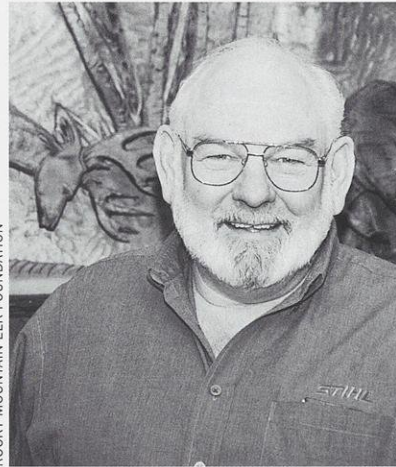
Male elk bugle for many purposes. The low whistling sound that builds and culminates in a high-pitched, throaty whistle or grunt carries a long way. The sound tells other bulls within earshot that the bugling bull lays claim to a territory and a harem.

When the elk herd was re-established in Wisconsin in 1995, there were only four to five mature bulls and 18 mature cows in the herd of 25. The bulls kept harems of up to 12 cows. They moved very little and consequently there was very little bugling. Now that

An elk bugle sounds like a combination of a hoarse, shrill whistle and a grunt that builds in intensity. The sound carries a long distance.



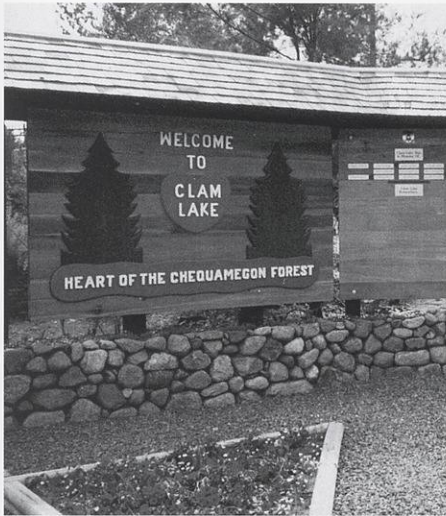
ROCKY MOUNTAIN ELK FOUNDATION



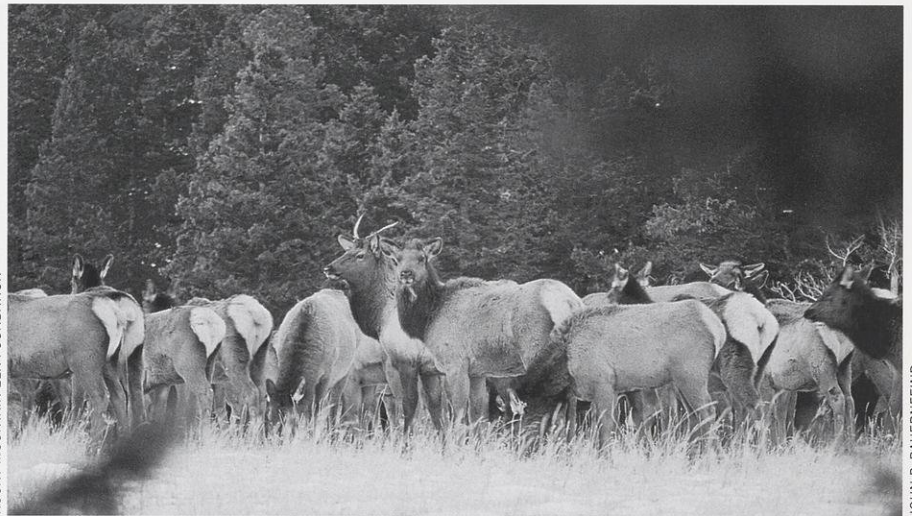
JAMES C. BISHOP, JR.







A roadside display welcomes Clam Lake area visitors to Wisconsin elk country.



Bull elk typically keep harems of up to 12 cows. The Wisconsin herd will number about 120 animals by year's end, DNR biologists estimate.

the herd has grown, a dozen different bulls have set up harems of three to five cows and several "satellite" bulls are pressuring the herd bulls. Consequently, the bulls move their harems more often, sometimes up to a few miles away.

Males start to bugle in early September and end in late October. Bugling keeps the harem in touch. More importantly, the calls bring the cows into estrus earlier and together. Cows that are bred in an early, shorter rutting season enjoy some distinct advantages. They have more time to forage before the winter snows and may grow healthier calves. Elk calves that are born earlier than deer fawns and closer together in age will be back with their herds before black bears start feeding on fawns in the spring. You may recall concerns about black bear preying on elk calves in 2000. That has not happened more recently.

Wisconsin's 100 elk inhabit about 288 square miles of range southwest of Clam Lake. They can be hard to find, but Stowell has an edge. The biologist and his assistants put radio collars on 46 of the animals to study their movements, feeding, mating, calf rearing, health and other activities. Tracking elk movements and mapping their spread tells a story of how the herd is growing.

During winter, when the elk herd can be more easily trapped, young bulls and all the cows are collared for research. Adult bulls tend to stay in bach-

elor herds separate from the cows and calves. The bulls are bigger, generally more aggressive and they eat a lot of food, Stowell notes. The calves and cows tend to stay farther away from the bulls where they can feed and fend for themselves if winter food supplies dwindle in an area. The radio collars send signals that can be detected up to three to five miles away on the adult collars; two to four miles on the smaller calf collars. Batteries last two to three years, so researchers have time to follow the herd and note their activities.

The Wisconsin herd population stalled somewhat during the 1990s due to a small number of mature bulls. The big bulls dispersed about 15–20 miles away from the main body of cows. In the early years of elk recovery in Wisconsin only immature bulls were present to breed the cows. Hence, the pregnancy rates remained low for several years. Now the herd is more balanced, but most reproduction still comes from the original 18 mature cows, and they are getting old. Several are 12 years or older and biologists wonder just how long these cows can continue calving.

Fortunately, there is plenty of prime elk habitat in the area and U.S. Forest Service practices ensure there will be plenty of food for the herd. The Clam Lake area of the Chequamegon National Forest is actively managed for timber harvest. There are plenty of young two-



Radio collars on elk send a signal that can be detected for 2–5 miles away for two to three years. Biologists follow the herd to note their range, movements and other herd dynamics as elk are reestablished in the Chequamegon National Forest.

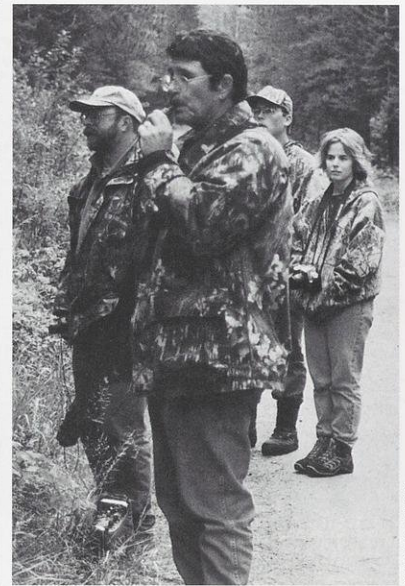
to 10-year-old aspen stands that the elk will forage during summer and winter. If present forest management is sustained, the only limiting factor for continued growth in the elk herd is time, Stowell says.

Using directional antennas on his truck, Stowell tunes into a radio collar on a younger bull that is within a few miles. It's a great fall morning with a touch of frost. Yellow, gold and red leaves hang heavy on the trees as the group quietly gets out of vehicles.

Walking a short distance, he takes a long dark tube resembling a radiator pipe from an old Chevy, holds it to his mouth, and gives a long blow. If the elk are in the mood and don't detect people, they may answer back during the fall rut. After his first call, Stowell gets a



ROCKY MOUNTAIN ELK FOUNDATION



BERNIE LEMON

(above) A bull elk responds as (left to right) DNR Elk Biologist Laine Stowell and RMEF Regional Director Bill Hunyadi call on an elk grunt tube. Good spots for hearing elk are shown below.

response, but never sees the animal in the thick foliage.

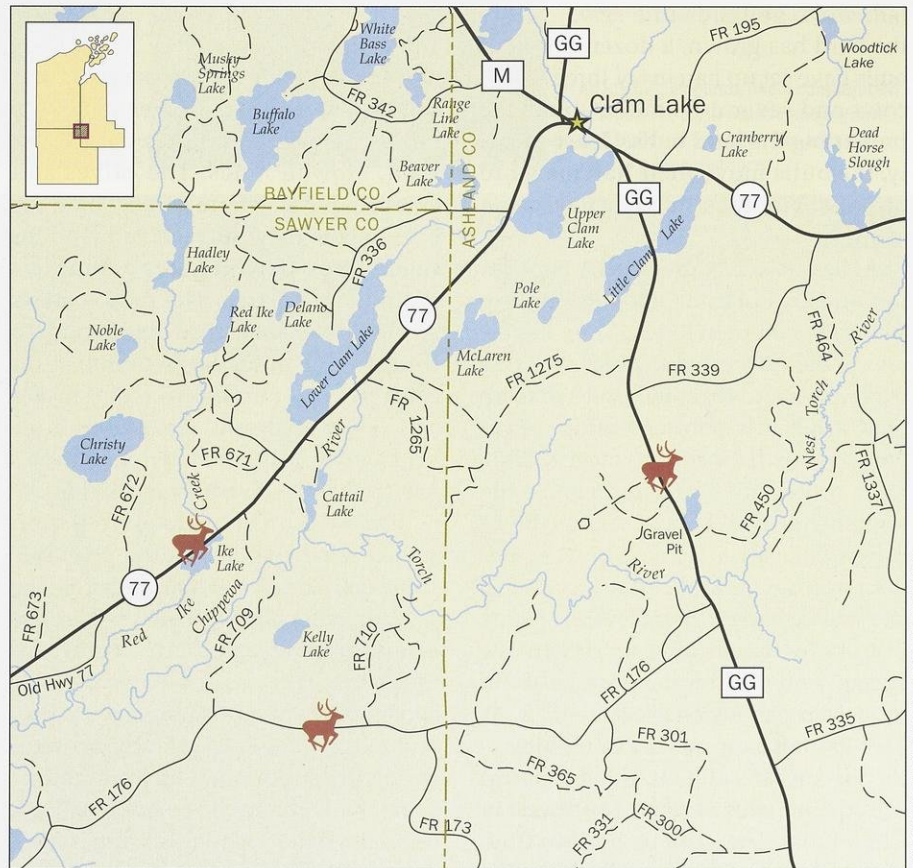
"At our second spot we got a response and had a six-by-six bull walk to us," the biologist said (six times on each side of the elk's antlers). "Needless to say when the two skeptics saw the bull, their eyes kind of glazed over," Stowell recalls.

The big bull milled around on the trail for a few minutes before wandering back into the trees. Radio collars told an unseen story. Nearby was a harem of six cows and the herd bull was about a half-mile to the north.

"In fact, that was the bull I was calling to," Stowell said. "I knew the cows were very close and to our west. The six-by-six bull approached us from the south. He probably thought the interloper to the north was moving in on his cows."

Talking to the elk is just part of the Bugle Days experience. The program includes an in-depth elk biology talk by Stowell, and evening dinner and campfire at the Whiskey Jack Camp, a private Northwoods hunting lodge whose members were founding supporters of reintroducing elk to Wisconsin.

Elk roamed throughout the state prior to European immigrant settlement. The last native elk was killed in



MAP BY MOONLIT INK FROM DNR INFORMATION

1886. In the early 1900s, efforts to reestablish elk in Vilas County failed, mainly because of poaching.

Organizing work by the Rocky Mountain Elk Foundation (RMEF) working with Wisconsin sporting groups, the U.S. Forest Service, the Ojibwe Nation, the Wisconsin and Michigan Departments of Natural Resources, Uni-

versity of Wisconsin wildlife researchers and some enthusiastic Wisconsin legislators created both support and funding to try bringing elk back to Wisconsin in the early 1990s. Following wildlife management plans and public hearings, parcels of the Chequamegon Forest near Clam Lake were selected as the first release site.





LANCE SCHELVAN, ROCKY MOUNTAIN ELK FOUNDATION

Elk were reintroduced to northern Wisconsin in forestland that is sparsely populated all the way up to the Bad River Indian Reservation and Lake Superior.

## Where to look and listen for elk

**T**he mixed hardwoods and conifers in the Clam Lake area provide good elk habitat, but generally poor elk viewing in the dense woods. However, if you can get out in the predawn light at a few select sites during the September rutting season, you might hear a bugling bull elk!

In eight years, the Clam Lake elk herd has grown from 25 animals to about 100 animals and is expected to increase by about another 25 this year. Over a dozen herd bulls will compete for cows this September with another dozen “raghorns” and “satellites” trying to horn in.

Young spike bulls usually haven’t matured enough to be sexually mature and therefore are tolerated by the herd bull. Raghorns are 2.5- to 3.5-year-olds and are sexually mature, but not usually confident enough to risk a direct challenge to the herd bull. Satellite bulls are usually 4.5 to 5.5 years old and hang around the harem. If they try to steal a cow, the herd bull will try to chase them off. If they successfully steal cows, their status changes to herd bull.

Armed with this knowledge, you can sometimes get an elk to bugle by sounding an artificial call and fooling him into thinking you are a bull in the area to “answer nature’s call.”

Three miles southwest of Clam Lake, on Highway 77 just south and below the highway lies small, marshy Ike Lake. Three different elk herds frequent the area to the southwest, southeast and northwest during the rut. Around September 20th, get there in the predawn dark. Park well off the road so you won’t be a nighttime hazard to logging trucks. Then listen.

Crickets will provide the background chorus, while birds will cue the oncoming light. As dawn starts to lighten

on the horizon, listen closely. The sound may be far away or right in your back pocket.

Raghorns sound a hoarse whistle. Satellite bulls and herd bulls start bugling at a low whistle, raise the call an octave, raise it another octave, then the sound slopes down. Big bulls punctuate their call with a deep growl. Seen or heard at close quarters, only a fool wouldn’t be immensely intimidated or impressed.

Actually, if you discover a bull is *really* close, back off a bit. A bull won’t normally approach you, but if you are calling and the bull thinks you are between him and his harem, you are going to want an escape route. Rutting bulls certainly chase and occasionally kill one another. I’ve never had such a problem, but I’ve seen too many photos of people being chased by rutting bulls. They have been known to injure or kill people who approach too close, so stay watchful. This Hwy. 77 site provides an excellent wide field of view and usually you will hear bulls a mile away.

If you are lucky enough to see an elk, look for its position in the herd and its antlers. Age dictates antler development. Raghorns have thin but branched antlers, usually with three to four points on a side. Satellite bulls have heavier branched antlers with four or more points on a side. They are only distinguished from herd bulls by whether or not they possess cows during the rut.

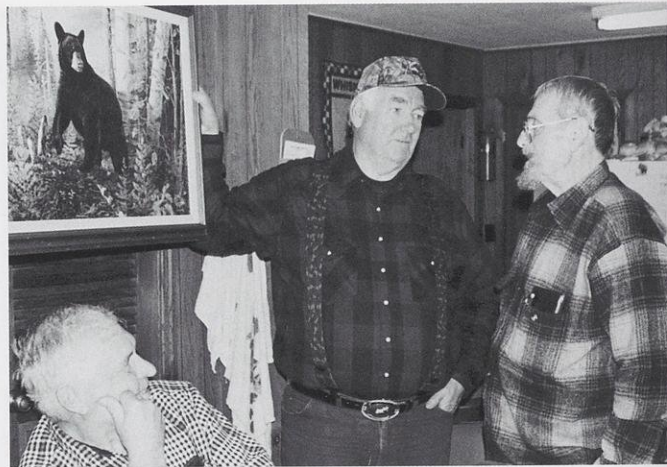
Please don’t beat the back roads hoping to get a glimpse of an elk. All you’ll likely see is dense cover, and you might well disrupt the continued growth of the herd, driving them toward obscurity. Elk need space to flourish. If you don’t hear or see an elk, you might look for elk signs — tracks in the sand, rubs on the trees, and an occasional pile of “elk rubies” should be satisfying enough. People who practice good stewardship are sometimes blessed with an earful or eyeful of elk on their terms.

Other potential elk listening sites are the U.S. Forest Service wayside three miles south of the intersection of Highway 77 and County Trunk GG. Scoop your ears to the west or southwest, for this herd bull.

Or try two to three miles west on GG. Take paved Forest Road (FR) 173 for about 1.5 miles until you get to a gravel road, FR 176. Take FR 176 to the west for another two miles until you come to the National Forest Wildlife Viewing Area on the south side of the road. The best time to try viewing elk here is a weekday morning when you’ll have little company. There’s a parking lot there and a gated trail. The viewing areas are still under construction and signs may or may not be completed by this fall. Perk your ears and listen to the west, north or east. If you’re really blessed you’ll see a bull and his cows enter the opening. Watch him arch his neck low, gape his mouth and hold up that massive crown of antlers. If the timing is right and the bull is willing, prepare for a soul-stirring sound.

— Laine Stowell, Wisconsin DNR Elk Biologist, Hayward





BOTH PHOTOS COURTESY OF BERNIE LEMON



JAMES C. BISHOP, JR.

*"We're proud that elk recovery in Wisconsin is sponsored by lots of supporters and isn't taking money from western elk programs or other Wisconsin wildlife projects." — Brenda Kruncos, chair of Wausau area Big Bull Falls Chapter and statewide chair of the Wisconsin Chapter of the Rocky Mountain Elk Foundation.*

Twenty-five elk from Michigan's Lower Peninsula were released in the forest. Today, the herd is growing steadily with the hope that the population will expand to 1,400 animals.

"The highlight of the Bugle Days trip for me was when Laine took us to that original site where elk were released, said Brenda Kruncos of Wausau. "He gave a history of elk in Wisconsin, and explained the radio-collar work."

Kruncos won space on the trip for herself and her son, Brian. Though she doesn't hunt, Kruncos enjoys the outdoors and took part in the Bugle Days raffle because the proceeds go directly

(left) Whiskey Jack Camp, a hunting retreat for several families, opened its doors to wildlife researchers and others who made plans to return elk to Wisconsin.

(right) Bernie Lemon (standing) and the late Ray Anderson, former UW-Stevens Point wildlife biologist discussed bear research, elk management and other wildlife projects taking place in the woodlands of Sawyer, Bayfield and Ashland counties.

to the Wisconsin elk recovery project.

"We are not taking money from the western elk programs or from other DNR wildlife projects," Kruncos said. She has been involved with RMEF in Wausau since 1991 and currently chairs both her local Big Bull Falls Chapter and the statewide RMEF chapter.


Following their field tour, the group travelled over gravel and sand roads to reach the remote Whiskey Jack Camp. In the tradition of many great hunting camps sprinkled throughout the state, Whiskey Jack Camp was built 44 years ago by a group of 15 hunting buddies and their families as a communal retreat and a quiet place to enjoy card games, the hunting seasons and each others' company. The hand-crafted lodge nestled in the Chequamegon forestlands can sleep up to 28 and has entertained hundreds over the years. The congenial owners and their heirs have a special relationship with state wildlife programs. The notion to bring elk back to Wisconsin was widely discussed and developed around the Whiskey Jack tables. In fact, the camp is still home base for the University of Wisconsin-Stevens Point black bear den research.

Here, formal dinner "wear" is jeans and a flannel shirt. If your shirttail sticks out, it's considered a "tux." Camp cooks equally relish the hospitality of preparing and sharing gourmet meals with their guests. After a feast from the camp galley, the Bugle Days bunch and

their hosts retired to the campfire outside. The group was treated to an insider's look into how elk once again became part of the Wisconsin wildlife mix.

"By lucky coincidence, the elk project was put in our back yard," said Bernie Lemon, founding member of Whiskey Jacks, elk hunter and RMEF North East Regional Chair. He heaped praise on a number of people, but singled out three for special mention — the late Professor Ray Anderson of the University of Wisconsin-Stevens Point, Martin Hansen of Clam Lake, and former Governor Tommy G. Thompson.

Dr. Anderson conducted studies that were later approved by the Department of Natural Resources recommending where to consider placing elk. Hansen helped convince Clam Lake residents that elk would not harm local deer populations and would increase tourism to the area. Gov. Thompson got the initial funding that was then built upon by RMEF.

"It was through their collective efforts that we now have these magnificent animals roaming our woodlands," Lemon said, "and it all happened because the citizens of this state wanted it and were willing to financially support it." They all wanted to hear the bugling call return to the Northwoods. 

*James C. Bishop, Jr. is DNR public affairs manager for the Northern Region based in Spooner.*





Forget the myths. Bats are fantastic flyers and champion skeeter eaters. Welcome them to your neighborhood for natural bug control.

# Respect the night patrol



DON BIEGEN

The little brown bat (*Myotis lucifugus*) likes to forage over water, trees and open areas eating a wide variety of gnats, beetles, wasps, moths and mosquitoes. They winter in caves or other close quarters. Summer colonies in buildings, hot attics or nest boxes can include several hundred individuals.

(top) A big brown bat (*Eptesicus fuscus*) zeroes-in on a moth. Almost all U.S. bats feed almost exclusively on insects. Many bats capture insects by flying erratically and scooping bugs into tail or wing membranes before picking them out with their mouth.

Karen Kvoool

"Going batty" suggests going crazy, acting weird, or perhaps being of unsound mind. In describing bats themselves, the term refers to the erratic flight these acrobatic mammals take in fluttering at dusk searching for food. Though bats are demonized in films, myths and stories, it's a bad rap. Bats are exceedingly helpful to humans and fascinating in their own right. Horror moviemakers don't do bats or our ecology any favors by making people fearful of these nighttime aerialists.

Though flying squirrels can swoop and glide, bats are the only mammals that can fly, and they are not blind. All bat species see, but some see poorly relying on a good sense of smell, keen hearing and echolocation to navigate and zero-in on food as small as a mosquito that they sense many yards away. The little brown bat, for instance, is such an accurate insect predator that the bat experts at Bat Conservation International (BCI) estimate one little brown can eat up to 1,200 mosquitoes an hour!

Bats are the number one predator of beetles, moths and other flying insects considered farm and forest pests. Their value to the food and tree economy is measured in billions of dollars per year. Where bats are encouraged and prolific, the need for chemical pesticides can be significantly



reduced. Several important crops depend on bats to pollinate their flowers or devour the pests that plague them. Some of the products helped by bats include avocados, cashews, guavas, peaches, bananas, dates, figs, cloves and mangoes.

Despite these values, bats are endangered in many areas and bat populations are in serious decline worldwide. Some of that loss is due to habitat destruction, some due to their slow reproduction rates (only one pup a year), but even more is attributable to willful destruction by humans. Bats tend to nest in large colonies, so a single act of vandalism or bad luck can destroy them by the thousands. In Wisconsin some of the manmade bat roosts like old barns and silos have fallen down. Other natural roost sites, like abandoned mines need a little maintenance to stay safe.

### Saving bat caves

For instance the Neda Mine Bat Sanctuary near Mayville in Dodge County is one of the three largest bat hibernation sites in North America. The old iron mine, abandoned in 1914, was donated to the University of Wisconsin-Milwaukee (UW-M) 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.

According to BCI's website, the decaying supports in the abandoned mine make many portions too dangerous for people to enter, so efforts to stabilize the bat hibernacula (winter hibernating chamber) have been dangerous and tricky. A host of cavers, environmental engineers and biologists contributed talents to preserve this lifeboat for hibernating bats. Partners included the University of Wisconsin, Department of Natural Resources, BCI, U.S. Fish and Wildlife Service, Zoological Society of Milwaukee County, the Max McGraw Wildlife Foundation and the National Science Foundation.

Both the bat populations and conditions in the dilapidated mine were studied to determine roosting areas and air flows.

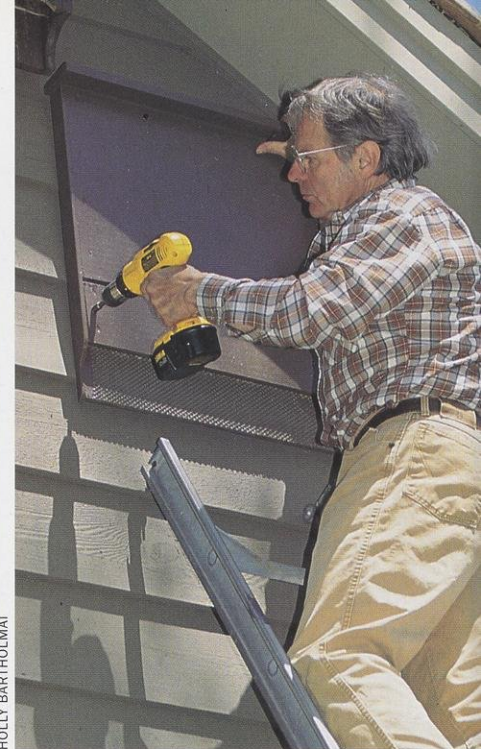
"Bats are full hibernators," explains Jim Reinartz, manager of the UW-M Field Station that oversees the mine. "Their body temperature drops to just enough to keep them alive and they may stay in a sleeping torpor for seven months in Wisconsin. If you wake them up too much, it will deplete the little energy they have saved to emerge from torpor and it will kill them."

Studies at the mine surveyed airflow patterns to decide which entrances were most important to keep open, according to BCI. Since cold air was entering through the lowest entrances and relatively warmer air was exiting through the highest, scientists and engineers carefully preserved the chimney-type air movement. Eighteen entrances had to be made safe, 13 were closed with large rocks that excluded people but permitted airflow. Five entrances were stabilized and gated so bats can get through, but people and animal predators can't.

Bat populations in dozens of other abandoned mines in Wisconsin and Michigan have less certain fates. As supports fall in old mines, the potential to trap and kill hibernating bats is a real threat.

### Evicting flying "tenants"

Bats tend to be quite timid around people. Other than occasionally seeing a bat screening the dusky air for bugs, you are most likely to see a bat if it gets into your house or finds a way into your attic. The dry, warm spaces in attics make natural roosts for bats, nevertheless your house doesn't have to be their cave. BCI's website, [www.batcon.org](http://www.batcon.org), offers easy, inexpensive ways to find out how the bats are getting in and how to evict them humanely. A UW-Extension Bulletin G3096, "Bats: Information for Wisconsin Homeowners," also offers tips. Basically, you just need to keep watch around sunset to determine where the bats are entering and leaving your attic. Then set up a square of plastic mesh netting just a few inches away from that entry and exit spot, hanging several feet down. The screening forms a sort of one-way door. Bats will crawl their way out, but will consider it too



HOLLY BARTHOLMAI

Bat houses can be erected on sunny eaves or on a post at least 10-12 feet high.

much of a hassle to keep dealing with the netting. Commercial bat excluders are also available.

Once the bats have left, you can seal up the space, but why not consider this an opportunity? If the bats are attracted to an area of your house, it might be an ideal spot to erect a bat house outside the home. That way you could get all the benefits of bats without the drawbacks of uninvited "tenants."

### A park where bats patrol 24/7

One of my family's favorite places to camp is Yellowstone Lake State Park near Blanchardville in northeastern Lafayette County. The park was built in 1954 following an extensive search for a place to create a park with a lake in the unglaciated hills and valleys of southwestern Wisconsin. The valley of the Yellowstone River was chosen, properties bought from local farmers and the extensive dike and dam project begun. The resulting lake is 2½ miles long, about a quarter-mile wide and covers 455 acres. It was stocked with fish and soon became a waterfowl refuge. Now it's surrounded by 5,100 acres of state land that offers swimming, fishing, water-skiing, sailing and boating. The property has campsites, picnic areas, launches, a new shower and restroom building, and almost no mosquitoes.



1



2



3



4



## The great eight

A bit about Wisconsin's eight native bat species:

**little brown bat** (*Myotis lucifugus*) The little brown is about as long as your thumb. These bats are common throughout the state and most frequently reside in attics and buildings. They are colonial bats that hibernate.

**Keen's bat** (*M. keenii*) similar in size and appearance to the little brown bat, but its ears extend beyond the nose when flattened forward. These bats are found statewide, but are more common in northern Wisconsin. They also are colonial bats that hibernate.

**Indiana bat** (*M. sodalis*) This endangered species is difficult to distinguish from the other *Myotis* species. It also hibernates in a colony.

**big brown bat** (*Eptesicus fuscus*) This "larger" bat is about twice the size of a little brown and tips the scales at ½ ounce. It is found throughout the state, but is more common in the southern half of Wisconsin. It roosts in buildings and frequently hibernates in colonies.

**silver-haired bat** (*Lasionycteris noctivagans*) This bat is bigger than the little brown and smaller than the big brown. Its fur is dark, nearly black tipped with white. The bat is solitary in habit, comes to Wisconsin seasonally and migrates south in winter.

**Eastern pipistrelle bat** (*Pipistrellus subflavus*) Our smallest bat is yellowish brown in color and only three inches long. It prefers caves, abandoned mines and rock crevices. It hibernates in colonies.

**red bat** (*Lasiurus borealis*) This bat is about the same size as the big brown. Its fur is a rusty red color that looks washed with white. The red bat takes daytime refuge in trees. It is a solitary species that migrates south.

**hoary bat** (*Lasiurus cinereus*) This bat is larger than the big brown and weighs about an ounce. Its fur ranges from a grayish yellow-brown to gray with grayish white overtones. It is found statewide but seems to prefer northern forests. The hoary is a solitary species that migrates south.

— Compiled from "Bats: Information for Wisconsin Homeowners," by Scott Craven and Frank Iwen, UW-Extension publication G3096.

1. Eastern pipistrelle bat 2. silver-haired bat 3. hoary bat 4. red bat



## Providing a home of their own

**B**irds and butterflies are fun to look at, but attracting bats to your homestead has an added benefit, you get your own squadron of bug battlers. No bug zapper or chemical fog sprayer holds a candle to the bats' abilities and desires to eat skeeters. Since a well-located, properly built bat house could attract up to 200 bats, you've got a lot to gain by establishing a bat colony.

Bat houses are easy to build, but if you'd rather buy a prefab house, they are readily available. BCI not only offers house designs, but they test and rate commercial houses. Houses that make the grade carry a "bat approved" BCI certification seal. Recommended brands and models are listed at their website. Locally, the Beaver Dam Senior Center that makes birdhouses and butterfly houses we have noted in the past, also makes a line of bat houses. Contact them at Beaver Dam Senior Citizen Center, 114 E. Third Street, Beaver Dam, WI 53916, or call (920) 887-4639 for an order form.

Here are some tips from BCI for building and locating bat houses that work. Get more details from "The Bat House Builder's Handbook," available from BCI for less than \$8:

**Design** — Bat houses look like a divided rectangular box or cylinder with open bottoms. Box types should be at least two feet tall, 14 inches wide and have a landing area at least three to six inches below the open bottom. Most houses have one to four roosting chambers spaced about  $\frac{3}{4}$  inch to an inch apart. The wood surfaces should be roughened up, scratched or grooved horizontally every half inch to provide the bats with gripping space. Quarter-inch to half-inch tough plastic netting also can be tacked on to provide gripping and landing space.

The house interior can get darn hot, so designs include both front and side vents.

**Materials** — BCI recommends exterior plywood or cedar, but do not use pressure-treated wood that contains chemicals. All screws and hardware should be exterior grade or galvanized to prevent rusting. Screws hold up to sun and weather better than nails. Caulk all seams.

**Waterproofing and warming the wood** — Apply three coats of exterior grade water-based paint or stain. Paint the house black in northern Wisconsin where mid-July temperatures are less than 85°F; dark brown or gray where July temps range 85–95°F. Interior surfaces should be coated with two coats of black exterior grade water-based stain.

**Location** — Bats would naturally choose areas within a quarter-mile of a stream, lake or river, but you can attract them to areas that are 10–30 yards from forest cover and near mixed agricultural fields and vegetation where insects swarm. Bat houses can be mounted to poles or buildings at

least 12 feet off the ground; 15–20 feet off the ground is even better. Wood or stone buildings that get sufficient sun make excellent choices. You can locate them under eaves that provide rain protection. Pole-mounted bat houses can be placed back to back and covered with galvanized metal roofing to shed rain. When placing a new bat house, install it in the spring. If you are trying to exclude a bat colony from a home or building, place the bat house two to six weeks before you start evicting bats.

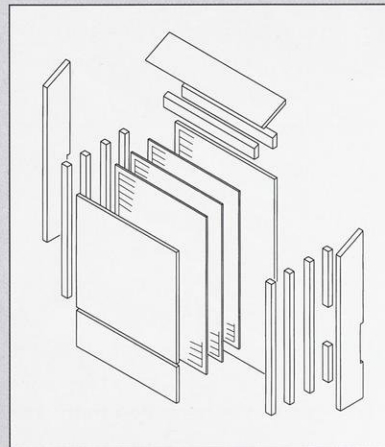
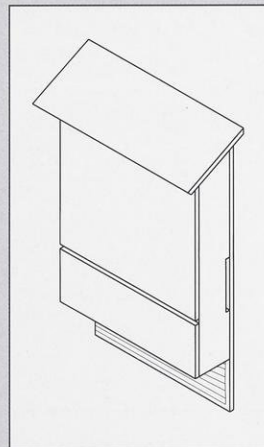
**Locations to avoid** — Really shady areas will only attract intermittent use by bachelor bats and non-breeding females. Locations over bright or white substrate that reflect up into the box are poor spots. Keep the box well away from burn barrels as smoke disturbs bats. Keep the box away from brightly-lit areas, exposed hilltops and windswept areas. Don't erect a bat house directly over highways as bats swarm the roost during their dawn returns and are vulnerable to auto traffic.

**Sun exposure** — In the northern two-thirds of Wisconsin, locate the bat house in an area receiving at least 10 hours of July sunlight. Areas with full all-day sunlight are preferable in Wisconsin. Avoid areas that are lit by bright night lights.

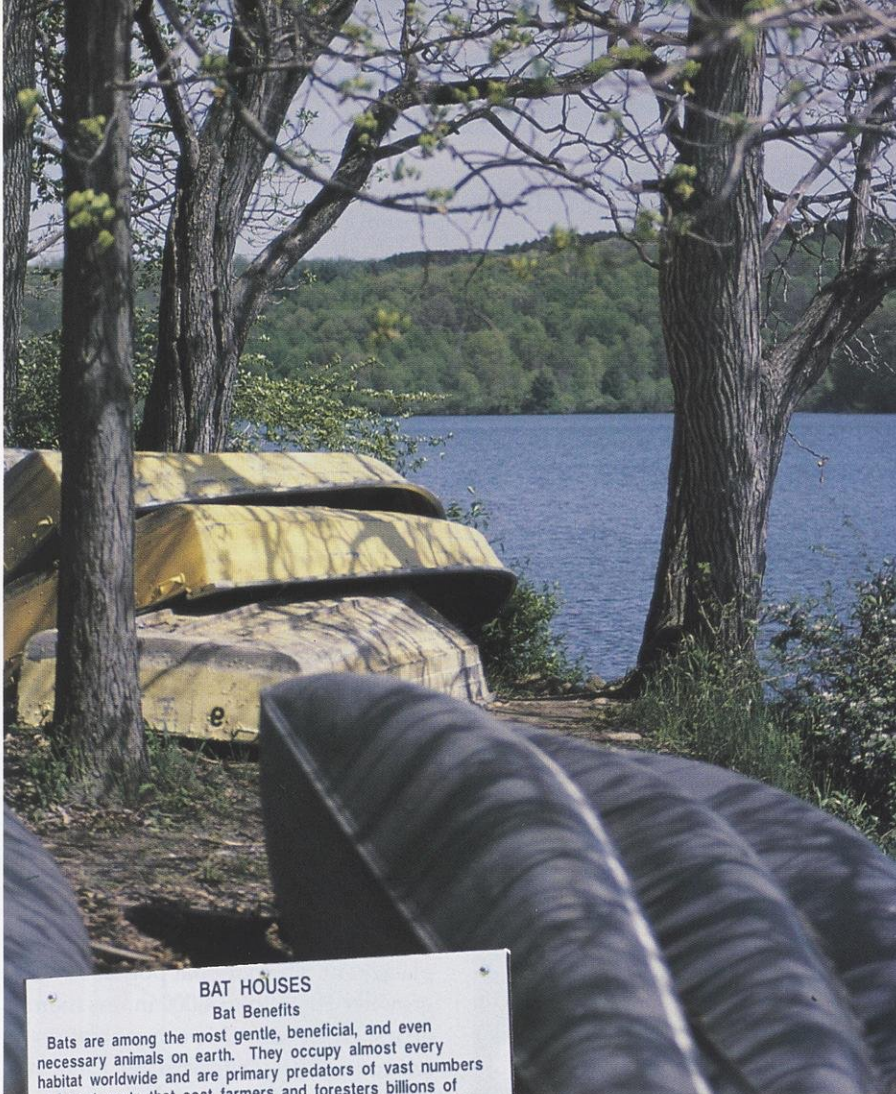
**Predator protection** — Bat houses on homes or metal poles provide the best protection from predators. The house should be at least 20–25 feet from the nearest tree branches where predators might roost.

**Wasp protection** — Wasps may try to set up shop in a bat house before the bats colonize a new house. Spacing the roosting areas about an inch apart may dissuade wasps. Clean out houses in late winter and early spring before the bats come back. Open bottomed houses will reduce use by mice and squirrels and will keep parasites from accumulating.

The Bat Conservation International website [www.batcon.org](http://www.batcon.org) offers handbooks and designs for bat houses. They also test, recommend, and certify bat houses from stores and catalogs that meet certain criteria.







ROBERT QUEEN

#### BAT HOUSES

##### Bat Benefits

Bats are among the most gentle, beneficial, and even necessary animals on earth. They occupy almost every habitat worldwide and are primary predators of vast numbers of insect pests that cost farmers and foresters billions of dollars annually. Bats also pollinate flowers and disperse the seeds that make the rainforests grow and the deserts bloom. Wherever bats are found, they are critical elements in nature's delicate web of life.

Bats are in serious decline nearly everywhere. Of the 44 species living in the United States and Canada, more than half are endangered or candidates for such status. Bats and their ecosystems must be properly managed and protected. Bats are essential allies in nature's delicate system of checks and balances.

Obtain more bat  
info at:  
[www.batcon.org](http://www.batcon.org)

ROBERT QUEEN

(above) Bat houses at Yellowstone Lake State Park were erected near high-use areas like boat rentals, launches and campsites.

(left) Signs educate visitors about the park's bat population.

The reason for this wonderful camping perk I've learned is bat conservation, and the project is both the scientific interest and the passion of park volunteer Kent Borcharding of Hazel Green.

During our summer camping trip, my husband and I were walking down a park sidewalk toward the amphitheater when we saw several large wooden boxes atop long poles. They were too big to be bird houses, had many designs and each was marked with numbers and letters. "What's that?" I asked, and

got my answer by reading the information posted nearby. They were bat houses, and they were darn effective. In fact, the bats that roost there seem to have nearly eliminated the mosquito population.

I remembered seeing bats on our farm as a child. They would fly fast and dive in the air around the farmyard at twilight.

Yellowstone Lake State Park is home to thousands of little brown bats (*Myotis lucifugus*), one of eight bat species in Wisconsin and about 900 species worldwide. The little brown is about thumb-sized with dark brown fur and black forearms and ears. Thirty-one handmade bat houses placed throughout the park provide roosting places during daylight hours and nurseries where the bats raise their pups. Some North Amer-

ican bats hibernate in caves or rocky places, others migrate long distances in fall to warmer climates.

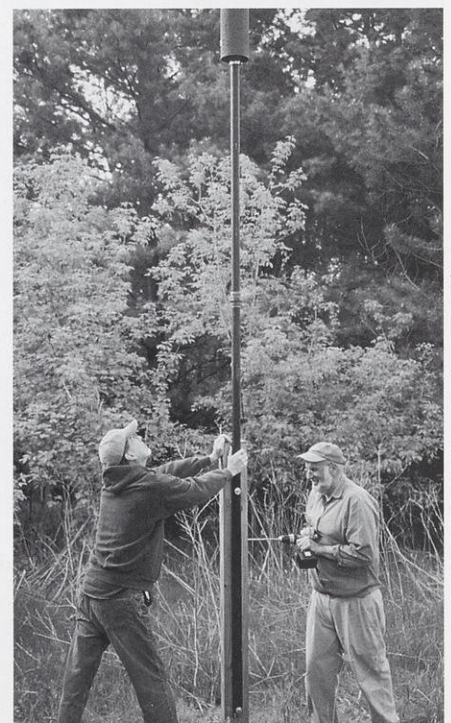
The bats are now a part of the evening entertainment at the park. Campers gather at the amphitheater to watch the bats flit about on their insect-hunting missions. Occasionally Borcharding gives educational presentations about the bats and his efforts.

"Everything in nature has its purpose," he said. Borcharding grew up on a farm and made birdhouses as a youngster. As an adult, he got interested in backyard birding and learned to make bat houses as well. "I did a lot of reading about bats and experimented with many designs," Borcharding said. He joined BCI, obtained some of their house designs and started working with the park rangers at Yellowstone Park.

He erected his first bat houses at the park in June of 1995 and has kept meticulous records of the designs, pole heights, baffles, angles to the sun and construction of each house. He regularly monitors how many bats use the different designs, and he experiments with different colored paints, heights and angles.

After talking with the park rangers, bat houses have been placed to provide maximum mosquito protection at high-

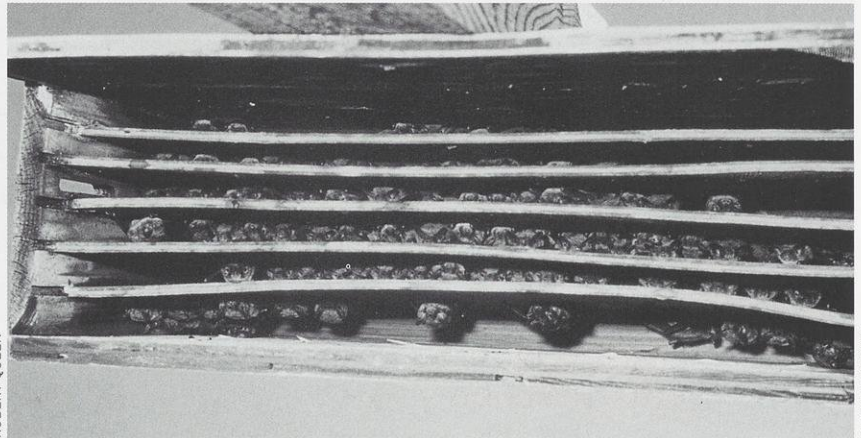
Park Superintendent Greg Pittz and volunteer Kent Borcharding erect a bat house with a cylindrical design at the park.



© MERLIN D. TUTTLE, BAT CONSERVATION INTERNATIONAL



## BATS BATTLE BUGS



ROBERT QUEEN

HERBERT LANGE

Mr. Borcharding experiments with many different shapes and designs to see which ones bats prefer.

Looking straight up from the bottom of a bat house you can see that roosting slots need to be narrow so bats can tuck in and protect themselves from would-be predators.

use areas near the park office, boat landing, amphitheater, shower house and the maintenance shed. All the houses are located where there is lots of sunlight within 30–50 feet from trees. He is

also careful to keep the houses away from wind and wind chimes. Since bats have such keen hearing, the regular tinkling sounds of chimes irritate them.

Borcharding also notes their aversion

to smoke. If there is a prairie fire in the area, bats will move far away from it.

Bats like houses made of “old wood,” Borcharding says. He collects his from dilapidated farm buildings. Obviously, his experiments are paying off. Little brown bats found and moved into his first houses within two weeks of their placement. The park bat population has grown to more than 4,000 in less than 10 years. Even with this concentration of animals, Borcharding notes there has never been one human/bat conflict in the park.

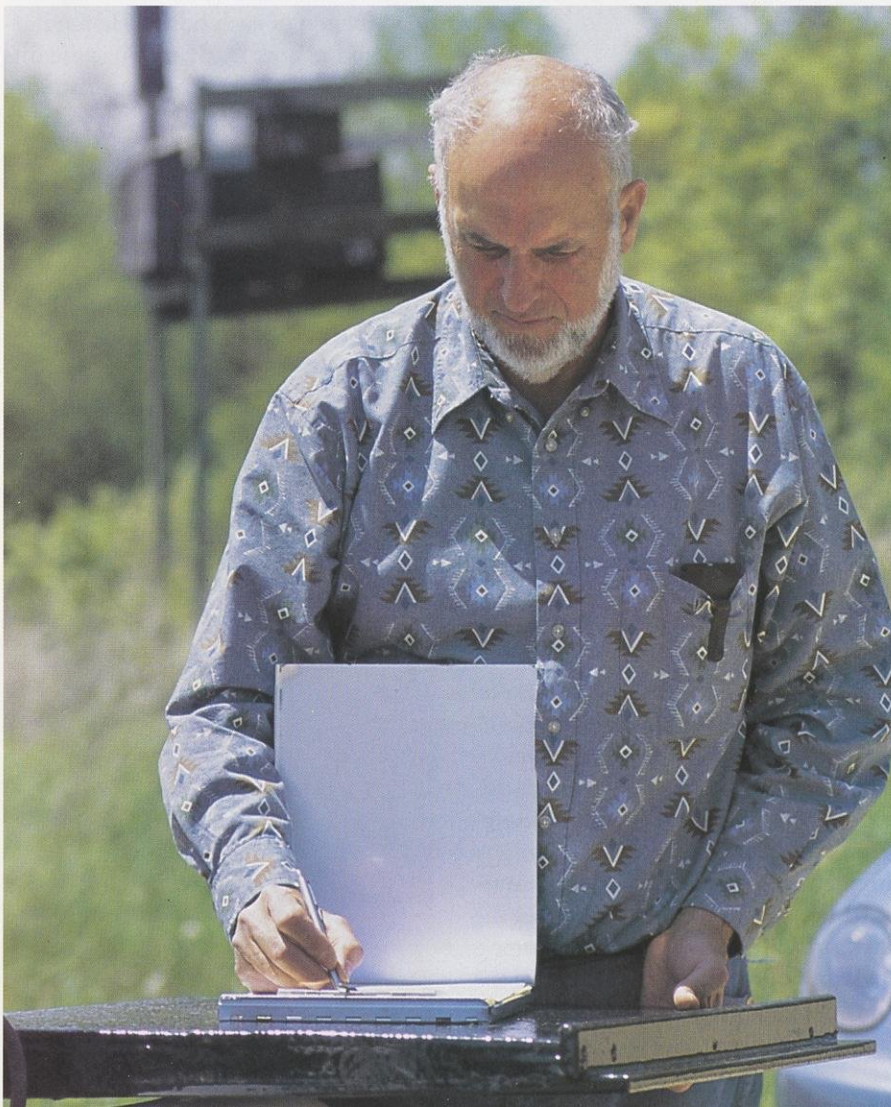
Borcharding also noted that bat guano is prized worldwide as a fertilizer and soil amendment by gardeners and organic farmers. “The giant pumpkins and other huge vegetables you sometimes see in pictures are often fertilized with bat guano,” Borcharding said.

Bats may have another important role to play as West Nile virus continues spreading westward. Erecting bat houses in areas prone to mosquito infestations could be an important chemical-free strategy for controlling the mosquitoes that have proven to be instrumental in spreading this infection to bird, horse and human populations.

All the more reason to get excited about going a little batty, building a few houses and inviting these valuable, interesting animals to your neighborhood.



For eight years, bat enthusiast Kent Borcharding has maintained and kept notes about the bat houses he has built and erected at Yellowstone Lake State Park.



ROBERT QUEEN

Karen Kvoil writes from Hartland.



# GREEN SCHOOL





# Green School

How “green” is your school? Do you make a special effort on a daily basis to conserve energy, paper and water? Adopting green practices often lowers costs to run and keep your school cleaner and can reduce exposure to hazardous materials. Schools across the United States, including Wisconsin, are recognizing the benefits of incorporating green habits for their buildings and grounds.

Green practices can serve as a model for classrooms, homes and communities. Students can learn concepts such as energy, recycling, and natural sciences by turning off lights, conducting classroom energy audits, saving paper to reuse the blank side, composting food waste, studying the natural environment right outside the door and more.

While installing low-flow faucets and energy-efficient heating and cooling systems may cost a little more initially, they save schools much money over time. According to Alliant Energy, a geothermal system can reduce heating bills up to 50 percent and cooling bills up to 30 percent. Many schools also have saved significantly through simple low-cost behavioral changes. One school district in California saved more than \$200,000 over four years by reducing its waste stream by 65 percent.

Green building is another way to reduce environmental impacts. If you’re building a school, consider green building practices. Think “green” when addressing five areas: siting, energy conservation, building materials, indoor air and environmental quality, and water conservation.

Through the Wisconsin Green Schools Program, your school can start on the path to environmental sustainability. By completing the comprehensive Green Schools Audit, students and staff can discover what environmental practices their school has already implemented and uncover areas for improvement. Students and staff can then work together to determine how to increase their school’s environmental performance, enhance its curriculum and provide better community service. By identifying and carrying out new environmental practices, your school can be a Green School.

To find out more about the Wisconsin Green Schools Program visit our website

[www.dnr.state.wi.us/org/caer/ce/greenschools/](http://www.dnr.state.wi.us/org/caer/ce/greenschools/)

and use this poster to learn more about what you can do at your school.

## 1 BUILDING

- The building is constructed with properly insulated windows and green building (sustainable and high performance) features such as recycled building materials. Windows overlook native landscaping and the building is mostly daylighted, which is the use of natural lighting through skylights, windows and light pipes. Daylighting reduces the demand on lighting and cooling loads. It reduces lifetime utility costs 30 to 70 percent, according to the Energy Center of Wisconsin. Innovative Design of North Carolina says academic performance of students who attended schools with daylighting was shown to be 5 to 14 percent higher.

- Blocks are made from recycled fly ash. Framing products include timber from certified sustainable forests and recycled steel. Sheathing and wallboard is made from 100 percent recycled newsprint and reinforced gypsum. Insulation is made from 100 percent recycled newspapers.

- Floor covering is primarily linoleum made from nontoxic materials, has a long life expectancy, and reduces moisture uptake and mold growth.

- Carpet made of recycled materials is used in the office and library for comfort and sound insulation.

- The heating and cooling system is geothermal, which uses the relatively constant temperature of the earth to help heat and cool the building by transferring heat and cold from the ground to the building.

- All rooms have digital thermostats, which do not contain mercury. Room temperatures automatically adjust for occupied and unoccupied periods. Thermostats are set at 68 °F for occupied periods during the heating season and 76 °F during the cooling season.

- Fresh air intakes are located high up on the building and away from street and parking areas for cleaner indoor air quality.

- When buying light bulbs, computers and appliances, the school purchases energy-saving models with “Energy Star” labels. Compact fluorescent light bulbs and fluorescent tubes are used throughout the building.

- All rooms have occupancy/motion and photo-sensors for the light switches that turn off lights when natural light is adequate or when rooms are not in use.

- Entrances have double entry doors to reduce heating and cooling costs and doormats (made from recycled tires) to reduce the amount of dirt brought into the building.

- Imitation slate roofing is made from 100 percent recycled materials and has a life expectancy of 100 years.

- The gutter system allows rainwater to soak into the ground rather than run into storm sewers.

- Recycling bins are located throughout the building. The school recycles newspapers, magazines, cardboard, office paper, aluminum and metal cans, # 1 and 2 plastic containers, computers and fluorescent bulbs.

- Potted plants are prevalent throughout the building. Plants help filter impurities out of the air and provide oxygen.

- The school uses Integrated Pest Management (IPM) to control pest problems and has an IPM plan.

## 2 OFFICE

- Nontoxic adhesives are used to attach tile and carpet. Walls are painted with low-VOC paint. Carpet is segmented so that only the worn squares are replaced — the carpet store takes back the old carpeting to recycle.

- The school uses an internal network for e-mail, scheduling, announcements, recordkeeping, inventory management and faxing. Staff turns off computers and monitors when they leave. Screen savers are prohibited; they use more energy than a blank screen.

- School staff embraces the “paperless office” concept so the copy machine is less elaborate and small; fewer printers are needed. They make double-sided copies and use refillable, reusable toner cartridges.

- The school buys supplies that contain recycled content and nontoxic office products such as paper, markers and trash bags.

- The school maintains a reuse cabinet for used file folders, office supplies, binders and more for others to use, and places paper that has only been used on one side into a reusable paper box.

- The school website keeps staff, students and community members informed of the results of energy and other conservation measures.

## 3 RESTROOMS

- Sinks, toilets and showers are properly maintained and equipped with automatic sensors and low-flow devices.

- Toilet paper and paper towels are made from recycled materials. Bathroom stalls are wheelchair accessible.

## 4 JANITORIAL SUPPLIES

- Janitorial staff uses nontoxic and low-VOC cleaning products. According to the U.S. EPA, indoor pollutants can reach 100 times that of outdoor air. Chemical sensitivity is on the rise, occurring in 15 percent of people.

## 5 NURSES STATION

- The school nurse uses digital thermometers and blood pressure cuffs instead of devices containing mercury.

- The nurse manages infectious and medical waste (needles, syringes, human blood, tissue and more) as a separate waste, collecting, storing, transporting and disposing of them as required by law.

## 6 CAFETERIA

- The cafeteria has an “offer versus serve” policy that allows students to decline menu items. Food waste is minimized because students take what they intend to eat and the food service manager adjusts meal production according to what students take.

- Students help collect food waste for composting and the school is testing a milk carton recycling program. Students help monitor recycling, composting and trash bins to insure all items are properly separated.

- Reusable trays, plates and silverware cut down on disposables and waste. Water-efficient and energy-saving appliances are used.

- Condiments are served from refillable containers.

- Student council sells cloth lunch bags with the school logo on them for students and staff who want to bring their own lunch. It’s cool to use sandwich keepers, cloth napkins and reusable containers.

- The cafeteria is a multi-purpose room, used by students and the community for programs and events. Tables/benches fold for easy storage.

## 7 LIBRARY/IMC

- Carpet is installed to muffle sound. It is made from recycled carpets and other materials (plastic soda bottles).

- Student book club maintains a book/CD/DVD donation/lending station.

- Students have access to computers throughout the school day and after school for research, checking on assignments, getting messages from school staff and submitting assignments.

- Library belongs to an inter-library loan program so staff and students have access to a greater variety of materials.

- School’s Green Team holds planning meeting in quiet corner.

## 8 CLASSROOM

- Local heating contractor discusses options available for thermostat replacement program that students hope to sponsor in their community.

- Teachers post class syllabus and assignments on school website. Students can electronically submit some of their assignments.

- Cooperative learning and hands-on activities are used in this class. This saves paper, builds team skills and increases student participation.

- Students write on both sides of their paper and used mixed paper is collected by students and taken to a local recycling facility.

- Consumer education classes study home water filters; evaluate energy conservation practices; and examine the marketing, convenience, protection, economic and environmental impacts of packaging.

- Desks are made from recycled steel and wood from sustainable forests.

- Classrooms are equipped with dry erase boards and nontoxic, low odor markers are used.

- School is experimenting with the use of “smartboards” which are linked to school’s computer system. Students can easily access classroom notes and keep them electronically.

## 9 TECHNOLOGY AND AGRICULTURE EDUCATION

- Students work on a computer recycling and reuse project. Used computers are solicited from local businesses, repaired and upgraded. They are either used in the school or donated. Computers that can’t be reused are recycled.

- Students are studying fuel cells to understand this technology’s potential. Students are testing light bulb efficiency as part of the Green School initiative.

- Students test car emissions and tune-up school district automobiles. All automotive fluids, tires, vehicle batteries and oil filters are collected and recycled.

## 10 SCIENCE LAB

- Chemicals and supplies are kept in a locked storage room with chemical-resistant laminate wood cabinets and doors. Only compatible chemicals are stored together. A current inventory of all chemicals, where they are stored and material safety data sheets are found in a binder on the wall of the chemical storage room and in the school office. Chemicals are bought in small quantities and never kept longer than two years. Hazardous chemicals are kept to a minimum.

- Mercury thermometers have been replaced with alcohol and digital thermometers. To learn more about mercury in schools go to [www.mercuryinschools.uwex.edu/schools/index.htm](http://www.mercuryinschools.uwex.edu/schools/index.htm).

- Students work with partners on “mini-labs” designed to reduce chemical amounts and other supplies.

- Some experiments are carried out under a vent hood, which exhausts and filters potentially hazardous fumes. Lab is equipped with emergency shower/eyewash station. Residues from experiments are managed as hazardous or biological waste as appropriate. Students and teachers wear safety glasses when necessary.

- Students enter data from stream monitoring activity into a statewide database. Here, they can compare their results with those found by other students throughout the state.

- Students experiment with a worm composting bin and ground-water model.

- Students are conducting a Green Schools energy audit of the school, observing and researching energy practices.

## 11 VISUAL ARTS ROOM

- Supplies are kept in well-ventilated and secure storeroom. Primarily water-based paints and adhesives are used. Oil-based paints do not contain heavy metals. Paints and glazes are nontoxic.

- The school receives surplus paper from a local printer and knobs and spools for art projects from a local manufacturer.

- Students reuse common household objects in art projects and some make their own recycled paper for drawings and paintings.

- Some students are making a sculpture from a log harvested from the school forest.

- Students rotate their art displays in public buildings.

## 12 SCHOOL GROUNDS

- Flower, herb and vegetable gardens provide diverse learning experiences for students and the community. Compost piles produce mulch that is returned to the gardens.

- A rain garden collects runoff water from the roof. Flowers, trees and the lawn provide a pleasant environment and offer windbreaks and shade around the facility for energy saving.

- Prairie plants and other native flora have been planted that adapt to the local climate and require less maintenance, water and chemicals.

- Playground equipment is made from recycled steel and recycled high-density polyethylene plastic that came from gallon milk jugs. The play surface is covered with wood chips made from the school forest.

- Students assist teachers planting shade trees.

- The athletic field is located over the geothermal heating pipes. The track is made from recycled tires and asphalt. The field is only used when necessary to allow time for turf to be maintained and grown.

- The school building and grounds are strategically located so students and community members can live nearby, reducing commuting costs and making the school a community resource.

- A Habitat for Humanity house is being built by students from technology education class as part of a work and learn program. Wood was locally donated.

- Students use the pond to learn about aquatic animals and plants as part of science classes.

- Interchangeable school sign notifies the community of school events they can partake in.

- A greenhouse is used by technology education, agriculture and science classes to start plants for the school’s gardens. Students study hydroponics.

- Conifer trees on north and west side of school act as windbreaks to help conserve energy.

## 13 SCHOOL FOREST

- The registered school forest provides an excellent opportunity to demonstrate sound forestry practices, encourage wildlife habitat, provide compatible recreational activities, promote land stewardship and provide outdoor learning experiences. The hands-on interdisciplinary nature of a school forest makes it ideal for meeting educator and student academic needs. To learn more about forests go to [www.uwsp.edu/cnr/leaf](http://www.uwsp.edu/cnr/leaf).

- Students learn about the forest community and its management through investigations, peer teaching, planting and observation. Students maintain interpretive signs and help establish learning stations and shelters.

- The school forest provides income for the school from trees harvested as part of the forest management plan and under the guidance of the DNR forester. Students help manage the forest by pruning trees and maintaining hiking trails.

## 14 TRANSPORTATION AND PARKING

- Parking lots are appropriately sized, spaced and made from recycled asphalt. There are recessed islands for infiltration and storm water filtration-retention areas. Closest parking spaces are reserved for car pool vehicles.

- A detention pond allows water to seep into the ground.

- Shade trees make the parking lot and school grounds more pleasant and absorb some water runoff.

- Modest lighting is energy-efficient and directs light downward.

- School encourages staff and students to bike to school and provides bike racks. The PTA and student council promote “bike to school” and “walk with a buddy” days.

- Drivers’ education classes use a hybrid gas/electric car and the school district uses fuel-efficient vehicles.

- Staff and students use mass transit, or students can take a school bus. The school bus is sized appropriately for its route.

- Sidewalks provide a safe route for students and staff.

- For more information on how your transportation choices can affect the environment go to [www.easybreathers.org](http://www.easybreathers.org).

Produced by: Wisconsin Department of Natural Resources  
Design and color: Moonlit Ink  
Illustration: Brian Strassburg  
Written and edited by: Natasha Kassulke, Joel Stone and Christal Winter  
© 2003, Wisconsin Natural Resources magazine, Wisconsin Department of Natural Resources  
Publ-CE-285-2003  
For copies call (608) 266-6790.  
Wisconsin DNR green schools specialists can help your school to become a Green School. Visit the Wisconsin Green Schools webpage at <http://www.dnr.state.wi.us/org/caer/ce/greenschools/> or call (608) 266-6790.  
Thanks to everyone who helped us develop the Green Schools Poster including the Green Schools Advisory Committee.

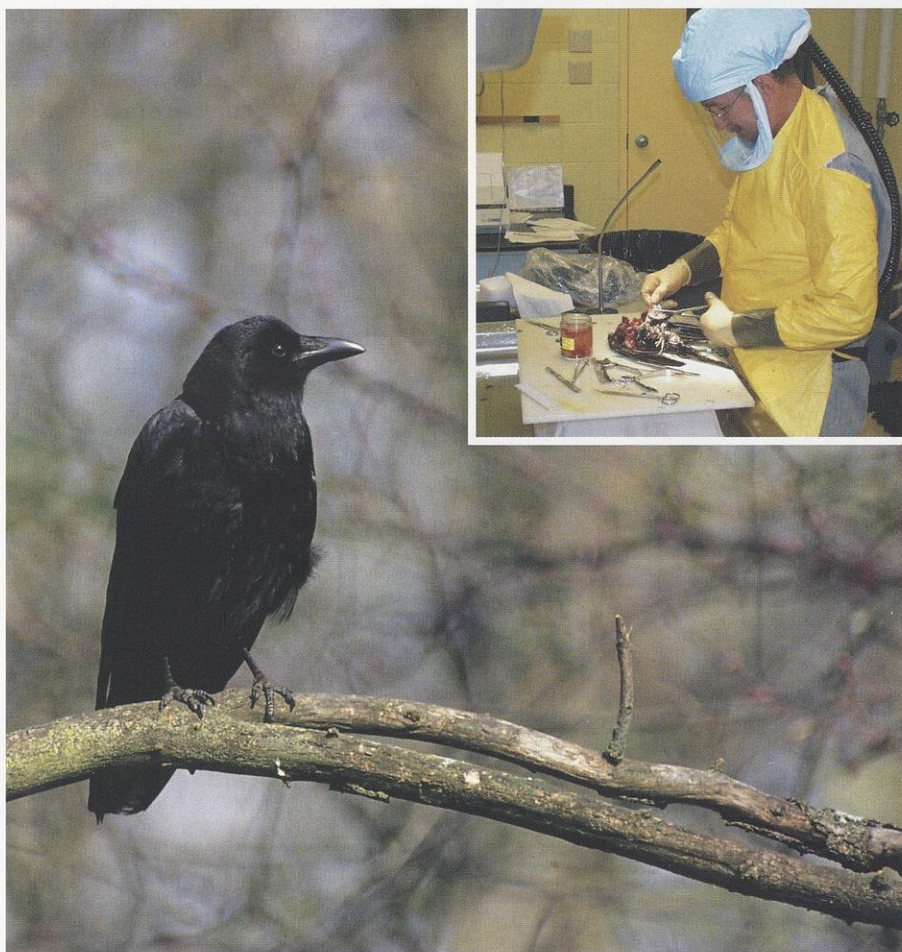




# A bug besetting birds, horses and humans alike

The West Nile virus will likely be here for a long time.  
How large a threat does it pose?

Sumner W. Matteson and Emi Saito



In the United States, crows bitten by infected mosquitoes indicate where West Nile virus prevails.  
(inset) Birds are examined and necropsied at the USGS National Wildlife Health Center in Madison.

In December 1937, a 37-year-old African woman in the West Nile region of northern Uganda became ill with a fever of 100.6°F. From her blood, doctors isolated and identified a flavivirus as the cause of her illness.

Now known as the West Nile virus

(WNV), it appeared periodically in the Eastern Hemisphere (Africa, West and South Asia, the Middle East, Eastern Europe) into the mid-1970s. Epidemics of the mosquito-borne viral infection affected primarily horses and humans. Birds were identified as the hosts of the virus.

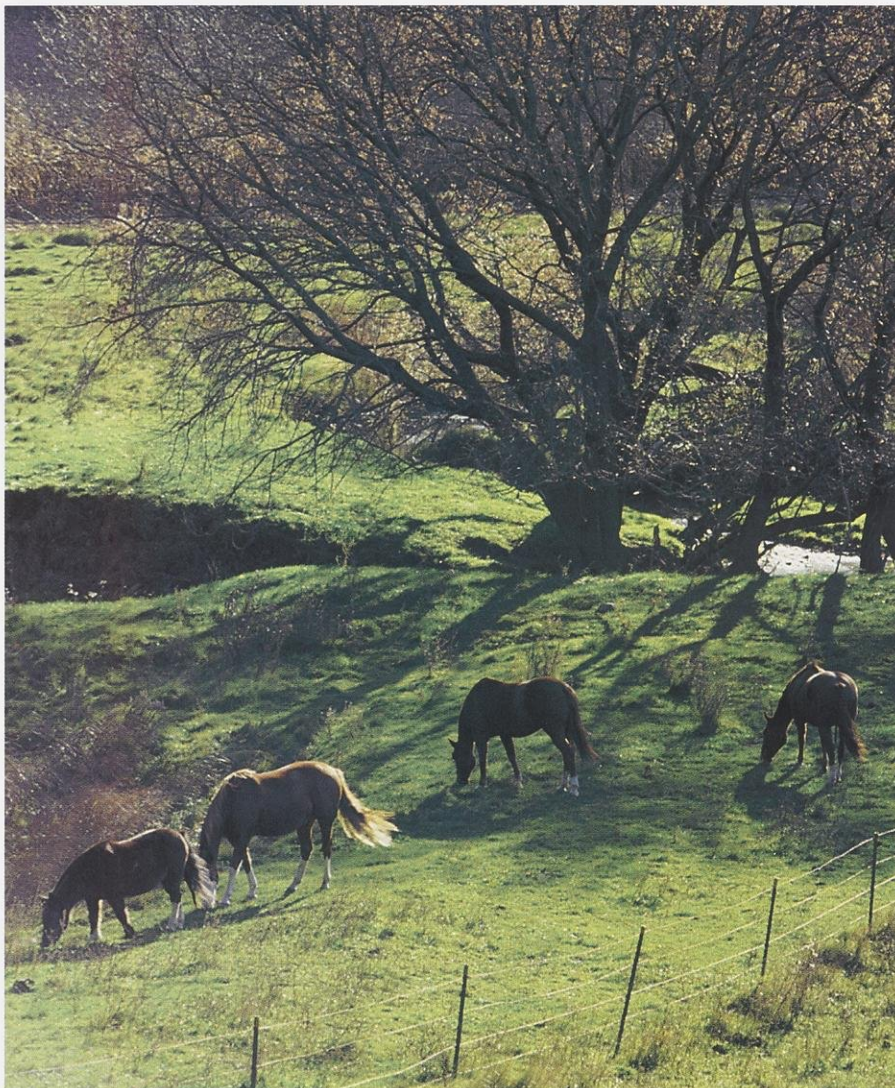
Although many bird populations in the region carried antibodies against WNV, indicating the birds had been exposed to the virus, there was no rise in bird mortality rates due to WNV.

Between 1975 and 1993, WNV virtually disappeared from the world stage, with no reported epidemics. The WNV story changed significantly starting in 1994, as the disease began to spread across North Africa, Europe, the Middle East, and finally into North America, causing more frequent and severe human and equine epidemics.

WNV was first detected on the North American continent in August 1999 in New York City. Researchers there discovered that the same infectious agent was responsible for human encephalitis cases and an increase in crow deaths. Originally thought to be St. Louis Encephalitis (SLE), a mosquito-borne infection that has been present in the Americas for decades, pathologists thought it unusual to see bird deaths associated with SLE. Further investigation by the Bronx Zoo and the Wildlife Pathology Unit of the New York Department of Environmental Conservation identified the infectious agent as West Nile virus.

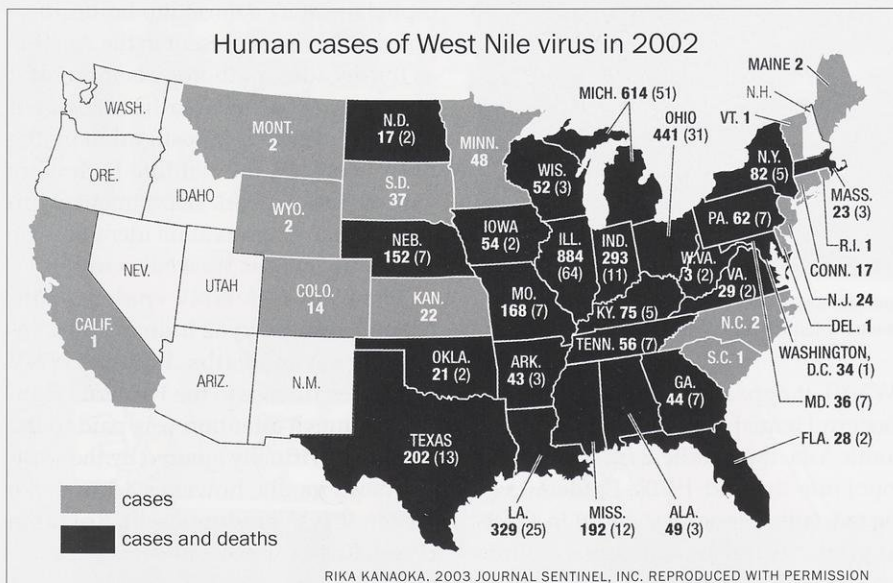
The New York WNV epidemic ultimately resulted in 62 human cases, including seven deaths. Because WNV was a new disease to the Western Hemisphere, much attention was paid to the discovery. Virtually ignored by the western news media, however, were much larger WNV epidemics in Romania (1996), Russia (1999) and Israel (2000).





Horses and people are believed to be “incidental” hosts of WNV and are unlikely to build up sufficient levels of the virus to infect biting mosquitoes.

(below) Lab positive cases are shown in bold and deaths in parentheses. WNV spread rapidly westward in the U.S. starting in 1999.



## A virus on the move

We do not know how WNV was able to jump continents and hemispheres and turn up in the United States. The existence of a nearly identical strain isolated from a dead goose in Israel in 1998 suggests that the U.S. strain (known as “NY99”) originated in the Middle East, possibly introduced by an infected migratory bird. Although there is insufficient evidence so far, migratory birds are thought to be responsible for introducing WNV in other regions of the world. Perhaps it was transmitted locally — WNV antibodies have been detected in resident, non-migratory birds in the Dominican Republic and Jamaica. It’s also possible New York City’s 1999 outbreak was caused by an imported animal, or by a stowaway mosquito on an airplane, ship or boat.

Another theory has to do with prevailing summer surface winds arising from the southeast, driven by a rotation of highs and lows passing through the jet stream. If a large, humid low pressure system from the south rotates counterclockwise, it would not only carry moist air but mosquitoes as well, since mosquitoes can migrate on moist, southerly winds.

Could an infected person have been the original source for WNV transmission in the United States? That’s unlikely. Humans generally do not develop high enough virus levels to transmit the virus to a mosquito. Could it have been an act of bioterrorism? Most health experts don’t think so, due to the relatively low proportion of the population affected to date and the lack of evidence that any laboratory has developed WNV into a biological weapon.

The Centers for Disease Control and Prevention (CDC) reported 4,156 human cases, including 284 deaths, in the U.S. during 2002 — the largest WNV epidemic with severe illness ever recorded. Almost half of the human fatalities occurred in the midwestern states of Illinois, Michigan and Ohio. Wisconsin had 52 cases and three deaths reported last year. That compares to a U.S. total of 149 human cases including 18 deaths from July 1999–2001, so the disease is spreading quickly.



The North American outbreak and recent epidemics in other countries indicate more severe forms of the disease have surfaced. Why? Again, the reason is unknown, but the virulence of the virus, the world's aging population (people 50 years and older are at risk, with 70 years and older considered high risk), and changing environmental conditions may provide clues.

### Transmitting WNV

Mosquitoes implicated in other countries as transmitters, or vectors, of WNV to birds and humans belong to the genus *Culex*. In the 1999 New York City outbreak, *C. pipiens* — the northern house mosquito — was fingered as the primary vector. To date, WNV has been detected in 36 mosquito species, but it is not known which of the 36 are important in WNV transmission to humans and other animals.

Mosquitoes that bite both infected birds and humans are known as "bridge vectors." During late summer, when newly fledged young swell U.S. bird populations, infected mosquitoes and humans may find themselves together on long, warm summer nights. WNV is most actively transmitted and detected during the summer and early fall in temperate zones, and likely is transmitted year-round in the warmer Gulf States.

In addition to mosquitoes, "hippoboscids" flies — commonly known as flat flies or louse flies that parasitize birds and mammals — have tested positive for WNV. Studies are underway in laboratories to determine whether these flies, as well as other ectoparasites such as ticks, may be important WNV transmitters.

Preliminary studies at the CDC found some birds can be infected if they consume infected prey or mosquitoes.

hunters. There is currently no evidence to suggest a person can acquire WNV by handling live or dead infected birds or other infected animals.

If a WNV-infected mosquito bites you, it may take a few days to two weeks to develop symptoms. An estimated 20 percent of people infected with the virus will develop relatively mild flu-like symptoms: fever, headache, muscle ache, skin rash, swollen lymph glands, nausea and vomiting. Symptoms can last three to six days. Less than one percent, or approximately one in every 150 people infected, will develop a more severe illness often referred to as "West Nile meningoencephalitis," a potentially lethal swelling of the brain and the membranes that enclose the brain and spinal cord.

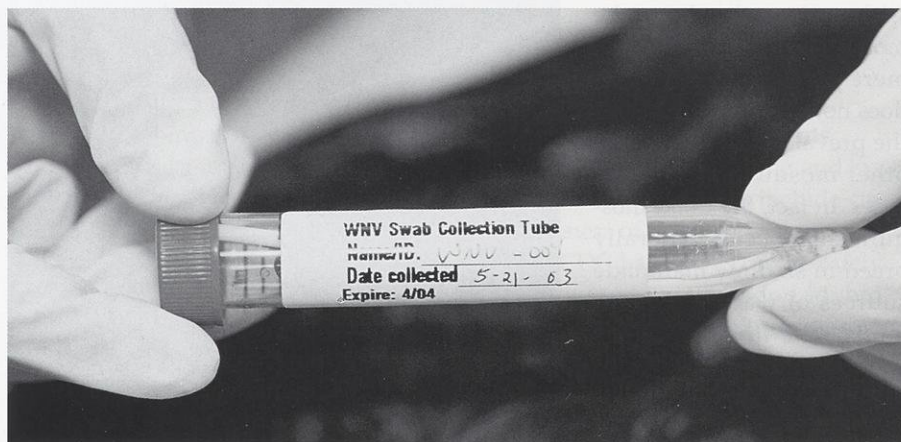
How long does WNV stay in an individual's blood? The virus has been detected for only a few days, and chronic infection is not thought to occur. What remains in the blood are the antibodies the body produces to fight the virus. These antibodies provide future protection from the virus and may confer prolonged, if not lifelong, immunity to WNV.

### Birds and animals get stung as well

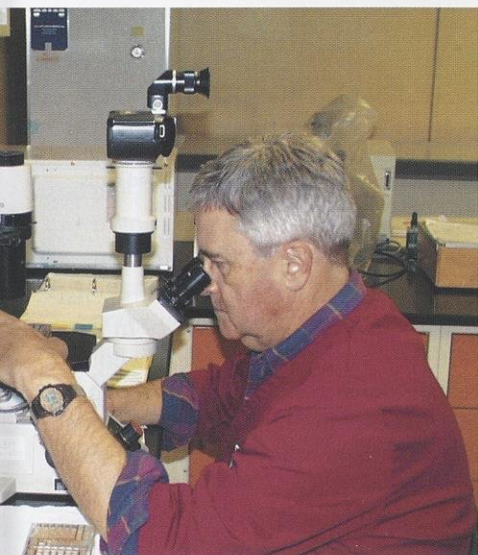
Birds are generally considered the natural host and reservoir for WNV. Infected birds may become "amplifying" hosts, meaning they build up sufficient levels of the virus in their blood to infect the mosquitoes that bite them. Mosquitoes with WNV carry virus particles in their salivary glands and infect birds, humans, and other animals when they bite them for blood meals. Horses and other mammals, including humans, are believed to be "dead end" or "incidental" hosts — once infected, their bodies do not carry sufficient levels of WNV to infect mosquitoes that may bite them.

During 1999–2002 in North America, corvids — crows, ravens, jays, magpies — had the highest mortality rates. Raptors, especially red-tailed hawks and great horned owls, were also hit hard in 2002 in the Midwest.

The disease's spread in Wisconsin mirrors its rapid march across the na-



ROBERT QUEEN



USGS NATIONAL WILDLIFE HEALTH CENTER

WNV was detected in birds from five southern Wisconsin counties in 2001 and in birds from 65 of our 72 counties in 2002. In Wisconsin, bird tissue and blood are examined for the virus at the National Wildlife Health Center, the State Laboratory of Hygiene and the Marshfield Medical Research Foundation.

In 2002, health officials identified new modes of WNV transmission in humans: blood transfusion, organ transplantation, through breast milk, intrauterine infection to the fetus during pregnancy, and accidental needle pricks in the laboratory setting. These findings have spurred efforts to develop testing methods for blood banks and to evaluate safety issues for laboratory workers, wildlife biologists, bird handlers and



tion. WNV was first detected in Wisconsin in a crow picked up in Milwaukee at the end of July 2001. By the end of the 2001 mosquito season, WNV had been detected in 58 wild birds primarily from the Milwaukee area, but also from Kenosha, Waukesha, Racine and Dane counties. In 2002, WNV was detected in birds from 65 of the 72 Wisconsin counties. The vast majority (96 percent) of Wisconsin birds testing positive for WNV last year were crows, some blue jays and a raven.

Nationally, threatened and endangered species such as the California condor, which number fewer than 100 in the wild, could be jeopardized if the WNV juggernaut hits the West Coast in 2003. Robust raptor populations generally can endure periodic high mortality from a severe disease outbreak or from a random catastrophic event. The condor, teetering on the edge of extinction, cannot.

Horses are particularly susceptible to WNV. Veterinarians diagnosed over 14,500 cases in 2002 alone; about 30–40 percent died or were euthanized because of chronic neurological problems. An equine vaccine introduced in 2001 has proven to be over 90 percent effective in field trials.

Currently, no human or bird-specific vaccine is available, but vaccines are under development and may be available in a year or two. During fall 2002,

Some 14,000 birds tested positive for WNV last year. Over half were crows, more than a third were blue jays and the remainder represented 92 different species.



USGS NATIONAL WILDLIFE HEALTH CENTER

the CDC in Colorado tested a new genetic-based WNV vaccine, and preliminary studies showed a 60 percent increase in survival rates in crows upon exposure to the virus. Although still experimental, the vaccine has been given to the California condors in hopes that it will help protect the species and prevent major setbacks to ongoing recovery efforts. To protect resident birds at zoos, veterinarians are vaccinating birds with the approved equine vaccine even though its effectiveness in non-equine animals is unknown.

### Protecting the natural and the home environment

Although wetlands can be mosquito-breeding sites, the mere presence of wetlands does not necessarily increase the prevalence of WNV and other mosquito-borne diseases. In fact, the *Culex* mosquito subspecies generally breed in shallow manmade sources of water, not wetlands. The important role wetlands have in the natural ecosystem health needs to be considered whenever officials begin to discuss wetland elimination as a means of reducing the risk of WNV infection. Even where WNV is prevalent, relatively few mosquitoes actually carry the virus. Realistically, the chances an infected mosquito will bite you are low.

The EPA has approved ground and aerial spraying of small quantities of organophosphates or pyrethroid formulations to control adult mosquitoes if surveillance data indicate a moderate to high level of risk for human infection. Minor eye and skin irritations, as well as breathing problems (asthmatic or allergic) have been associated with such



The mosquito species implicated in WNV breed in stagnant, standing water. Some communities are treating such areas with larvicides. Healthy wetlands are home to fish, insects and birds that eat mosquitoes and reduce mosquito populations.

applications, mainly in persons sensitive to the active ingredients or in those with pre-existing respiratory conditions. Contact your local health department to find out if spraying is planned in your neighborhood and take the recommended precautionary measures.

What are the environmental consequences of spraying to control mosqui-



toes? When applied correctly, these pesticides are reported to have low toxicity to wildlife. Even so, non-target species such as other insects, birds and aquatic organisms may be affected. Data on more than 4,000 birds gathered by the New York Wildlife Pathology Unit as part of that state's WNV surveillance program found approximately 48 percent of the bird deaths could be attributed to pesticides or other chemicals commonly used around the yard or in agriculture. Spray programs are now the focus of several laboratory and field studies.

Homeowners can make their immediate surroundings less congenial to mosquitoes by eliminating any stagnant


pools of water in containers. Once or twice a week, empty water from flowerpot saucers, pet food and water dishes, birdbaths, swimming pool covers, buckets, barrels and cans. Turn over wheelbarrows, wading pools and boats when not in use. Check and clean clogged rain gutters, and remove discarded tires and other items that collect water. If you have a flat rooftop, consider sweeping it regularly to deprive mosquitoes of breeding spots. Contact your local environmental health or county mosquito control program to report suspected mosquito breeding sites in your neighborhood.

To control mosquitoes in still or stagnant waters, municipal authorities are

turning to larvicides with a biological organism (*Bacillus thuringiensis* var. *israelensis* and *B. sphaericus*) as the active ingredient. Methoprene, a biochemical regulator that interferes with mosquito larvae maturation, has also proven effective. These larvicides have not been associated with any serious health effects to date, nor are they known to harm other aquatic life according to public health officials. Some regions have introduced populations of larvae-eating mosquito fish (*Gambusia* spp.) into bodies of water as an alternative.

### A long-term relationship

What are the long-term consequences of WNV for birds? No one knows, but the general consensus among ornithologists is that species such as the American crow and blue jay will likely co-evolve with the virus and eventually develop sufficient immunity, as have the birds where WNV is endemic in Africa. We hope to learn more about WNV's long-term effect on birds from established traditional monitoring programs, such as the Audubon Society's Christmas Bird Count, the federal Breeding Bird Survey, and other long-term initiatives to monitor birds.

For humans, the future of WNV can be glimpsed from a look at Africa, where the virus has existed for a long time. Most people in the African endemic areas are likely exposed to WNV during childhood and subsequently develop antibodies, which provide prolonged immunity. In North America, it has been predicted that WNV will persist in the environment at low levels, circulating among birds and mosquitoes, and causing occasional human and equine epidemics. The hope is that we, too, will adapt along with the virus, develop immunity and witness fewer severe outbreaks. 

*Sumner W. Matteson is a DNR avian ecologist. Emi Saito is the West Nile Virus surveillance coordinator for the USGS National Wildlife Health Center. Both are based in Madison.*

## Protect yourself from WNV

Although WNV will likely be a part of our lives for years to come, there's no need to curtail outdoor recreation. Take the following precautions and you can confidently enjoy your time outdoors:

- Check with your local public health agency or DNR office for information on WNV risk in your area. If you plan to travel to an area where WNV activity has been detected, get information about the location before you go.
- Wear clothing that covers the skin, such as long-sleeved shirts and pants.
- Apply insect repellents, such as those containing DEET, to clothing and exposed skin. Two possible alternatives to DEET-based repellents include citronella oil and Skin-So-Soft lotion. The effectiveness of these two products as mosquito repellents has not been proven. The CDC has details on the safety of DEET, including its use for children, at [www.cdc.gov/ncidod/dvbid/westnile/city\\_states.htm](http://www.cdc.gov/ncidod/dvbid/westnile/city_states.htm) or contact The National Pesticide Information Center at 1-800-858-7378, [npic.orst.edu](mailto:npic.orst.edu)
- Curb outside activity during the hours mosquitoes are feeding, especially at dawn, dusk, and early evening, the peak mosquito-biting times.
- Install tight-fitting screens to doors and windows to keep mosquitoes from entering your home. Check window and door screens for any holes and repair them. If your house or apartment does not have screens, consider stapling or tacking screening across the windows.
- If your job requires that you work outdoors on a regular basis, try the protective measures recommended by the CDC: [www.cdc.gov/niosh/topics/westnile/#workenv](http://www.cdc.gov/niosh/topics/westnile/#workenv)
- If you or family members develop symptoms such as high fever, confusion, muscle weakness, and severe headaches, see your doctor immediately.
- Report sick or dead birds and other wildlife to your nearest state and/or federal wildlife agency. To report sick or dying birds for West Nile virus monitoring in Wisconsin, call the WNV hotline: 1-800-433-1610.
- For maps showing the spread of WNV nationally: [cindi.usgs.gov/hazard/event/west\\_nile/west\\_nile.html](http://cindi.usgs.gov/hazard/event/west_nile/west_nile.html)
- For information on the status of WNV in Wisconsin: [www.dhfs.state.wi.us/dph\\_bcd/WestNileVirus/Index.htm](http://www.dhfs.state.wi.us/dph_bcd/WestNileVirus/Index.htm)



Gregory M. Kinney

**T**he smell of rotting lake trout drifts on the heavy night air through the pine and cedar forests near Lake Superior. Soon a brown figure, zig-zagging through the darkness patrolling for squirrels or perhaps a porcupine, locks on to the scent.

Approaching the camouflaged, baited live-trap, the 10-pound fisher with a tense, tough wolverine-like attitude nervously twitches a cat-like tail. He steals a glance over his shoulder and slips into the wire cage to snatch the decomposing bait. Clank! The trap-door slams shut and the startled animal, a thrashing prisoner, paces during a long wait until morning. Then he will endure an unimaginable journey and a lifetime change — an eight-hour plane ride to a new life in the woods of Tennessee.

This arboreal weasel, sometimes called a wejack, but popularly known as a fisher (*Martes pennanti*), is one of 40 animals (20 breeding pairs) caught for a special project in the Chequamegon National Forest and surrounding woods of northern Wisconsin. The fisher will be tested, collared and, if found to be in good health, shipped to the 80,000-acre Catoosa Wildlife Management Area of eastern Tennessee. Fishers disappeared from that part of the Tennessee woodlands more than 120 years ago following intense trapping and logging.

“Our primary reason for reintroducing fishers is to restore the diversity of fauna that once lived here,” said Bruce Anderson, a biologist for the Tennessee Wildlife Resource Agency (TWRA). Also, he adds fishers were famous as voracious predators and are “a great biological control on egg-eating animals like skunks and possums,” whose populations are rising rapidly in those woods in the absence of any natural predators. The reasoning goes that fishers can help restore balance by feeding on animals that prey on ground-nesting birds. The Tennessee biologists believe the restoration project should help populations of game birds like grouse and wild turkeys flourish.

In 1998, with funding provided by nonprofit groups like the Defenders of



# A long journey for the night hunter

**Restoring the range where fishers roam takes teamwork.**



DNR WILDLIFE MANAGEMENT FILES

Wildlife and the Extirpated Species Foundation, Tennessee went shopping for fishers. Their first stop was in Wisconsin, which has a well-known program for managing furbearers and a reputation for helping with such projects.

“In the early 1990s, biologists in Montana had asked us to supply fishers for a project, said John Olson, Wisconsin DNR biologist in Park Falls. “We are extremely cooperative in projects like this. Fortunately, we have strong fisher populations and we can share some. We are proactive in supporting others, and we have similarly been the beneficiaries in the past.” Olson said that Wisconsin’s native fishers were extirpated in the late 1800s and reintroduced here in the





(BOTH PHOTOS) MIKE GUSTAFSON

Fishers are wary and tough predators.

(right) Trapper Mike Gustafson adds extra wire to secure his live-traps because fisher have been known to break through the steel traps.

1950s and 60s from sources in Minnesota and New York. An estimated 10,400 fishers live in northern Wisconsin alone, slightly more than were planned in state management goals. Olson noted how wild turkeys from Missouri and, more recently, elk from Michigan were instrumental in reestablishing these extirpated species here in Wisconsin.

Anderson said that TWRA had established long-term, solid working relationships with Wisconsin colleagues and other personnel. "They are being good neighbors to us, and someday we hope to return the favor."

When trappers Mike Gustafson and Curt Basina got wind of the Tennessee fisher reintroduction program, they wanted in on the project in a big way. Both are members of the Red Cliff Band of Ojibwe Indians located north of Bayfield in the boreal woods that border Lake Superior. "We were both very interested in working with live animals," Basina told the *Masinaigan*, a quarterly tabloid of the Great Lakes Indian Fish

and Wildlife Commission (GLIFWC). "I've got a lot of respect for the fisher," Basina said. "They are hunting machines." Basina normally traps fishers with quick-killing conibear traps for sale to commercial fur markets.

In addition to their professional trapping duties, both Basina and Gustafson are trapping teachers and members of the Wisconsin Trappers Association. Their services came highly recommended to the biologists from both the Red Cliff Band and GLIFWC. Each of the trappers has since earned the respect and admiration of all the biologists involved in the trapping project. When the two woodsmen assured the Wisconsin DNR staff that they could fill the first-year quota of fishers (20 animals) in just 10 days of trapping, the officials were a bit dubious. Wildlife managers had estimated the trappers would need about 40 days to capture 20 of the extremely elusive fishers. In fact, the trapping team caught 32 fishers in just five days!

Gustafson and Basina both set out 25

wire live-traps on the northern edge of the Chequamegon National Forest and surrounding lands in Bayfield County. Each three-foot-long wire box was draped and covered with a spruce bow canopy and baited with decaying fish and skunk scent to beckon the long, sleek night hunter. Basina won't divulge one of his more effective "entice-ments" to lure in the wary weasel — "Ancient Indian secret," he says with a grin. The two men checked their traps every morning, often to get greeted by a 10- to 12-pound hissing, thrashing customer awaiting the arrival of its captor.

The two trappers are quite modest in describing their success. Basina surmised that an approaching powerful low-pressure system may have driven the voracious predators into some kind of hunting frenzy. "They were just on the move and clearly on the prowl," he said. Left to explain the eighth fisher caught in one night on one trapline, Basina admitted it was something he and his partner hadn't previously seen. "This was truly extraordinary by any standards. Just unbelievable."

Whether owing to weather, skilled trapping techniques or Indian "secrets," the unprecedented success thrilled everyone involved in the transfer and relocation project. Staff from the TWRA, GLIFWC, Wisconsin DNR, and Gretchen Gerber, a local veterinarian inspected each fisher, took a tooth sample for aging, determined the animal's sex and other measurements, fitted the sedated animal with a radio collar, then crated and prepared the fishers for the plane ride from Ashland's JFK Memorial Airport to Tennessee. Upon arrival, each animal was transported to the woodlands and set free.

"This project demonstrates that when state agencies, tribes and the private sector work together, great things can be accomplished, Bob Ferris, vice president of species conservation for Defenders of Wildlife told the Environmental News Network. "With the return of fishers, the mountains of East Tennessee are a little bit wilder, a little bit more natural than they were last year," or indeed, for more than a century. ■

Gregory M. Kinney writes from Bayfield.







# A new hunt, a new challenge

Wisconsin's first mourning dove hunt opens September 1st. Here are tips to get going.

Jeff Pritzl

"Why the heck do you want to hunt doves?" my friend asked. "They're so small! You'll have to shoot quite a few to make a meal of them."

"Why do you fish for bluegills?" I countered. "They're so small! You'll have to catch quite a few to make a meal of them."

"But mourning doves are the state symbol of peace!" he touted.

"Whitetails are the state wildlife mammal and muskies are the state fish. I sure hope the label 'state symbol' doesn't designate something that can't be eaten. Dairy cows are the state domestic animal. No more dairy products in Wisconsin? That'll go over big!" I chided him. "Besides, I go on plenty of hunting trips where all I come home with is a bag limit of peace and quiet."

I thought I had made my case. He persisted, "Okay, but what kind of challenge is there in hunting doves? I practically have to chase them out of my bird feeders, and a bird on a wire is like a fish in a barrel."

I replied, "Have you ever heard the story of the country mouse and the city mouse? Same animal, two separate lifestyles. Doves are the same way, just like waterfowl. Just because you can hand-feed some mallards and geese in a city park, doesn't mean you can drive out to the marsh and get them to walk up to your truck!"

"So how do doves taste?" he asked. I answered, "I hear they are excellent table fare, but I honestly couldn't tell you, I haven't had a chance to eat one...yet. But that's going to change this fall!"

For 85 years, mourning doves have



Dove hunting opens September 1st, starting off an earlier hunting season for Wisconsin bird hunters.

not been hunted in Wisconsin. Thanks to several years of effort, education and biopolitics, Wisconsin will join 39 other states that list doves as a huntable gamebird this fall. Mourning dove season will open September 1st and run through October 30th. As in most states, the bag limit will be 15 birds per day, and the possession limit will be 30. Doves are a federally managed migratory gamebird. Although you don't need a federal or state migratory bird stamp to hunt them, you are required to use a magazine plug to limit your gun's capacity to three shells. You will also need to go through HIP certification when you buy your small game, sportsman, or patron license, just as you would to hunt migratory woodcock.

Mourning doves are small game, but certainly no smaller than other popular quarry including woodcock, snipe, quail and green-winged teal. It takes about three doves per person to make a decent meal, but the abundance and prolific re-

production of the species allow for very liberal bag limits without impacting the population. Nationally, more doves are harvested than all other migratory gamebirds combined. So what is this dove hunting all about? Take the opportunity this fall to find out for yourself.

## Why hunt doves?

Mourning doves have all of the requisite qualities of a gamebird. They are abundant, a successful hunt is an acquired skill, and they make excellent table fare. Since doves feed almost exclusively on weed seeds and small grain, the meat has a mild flavor that can be accented with your favorite red meat marinades and sauces.

Doves are prolific breeders. Although a hen only lays two eggs per nesting attempt, they nest early and raise several clutches in a Wisconsin summer. Chicks hatch, fledge and are on their own in only a month's time. Animals with such high birth rates subsequently also have high death rates, and doves provide food for many animals in the food chain. Regulated hunting accounts for a small portion of their mortality and will not influence the future size of the population. In fact when you compare long-term population trends across North America, you can't tell which states allow dove hunts. As with all wildlife, habitat and weather determine the population.

Don't let the image of a dove sitting on a wire or birdfeeder fool you. Shooting doves within city limits at birdfeeders or on utility wires is illegal, unsafe

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and unethical. A dove on the wing in open country will humble the best wingshots among us. Ohio studies show that urban doves tend to stay in town and do not expose themselves very often to hunting. On the other hand, they stand a much greater chance of becoming a meal for free-roaming neighborhood cats.

The opportunity to pursue doves adds a new opener to the hunter's calendar. The first several weeks of September are shared with early season goose hunters. Archery deer and several small game seasons open in mid-September, but most bird hunting doesn't get into high gear until October, so plan on adding to your days afield this fall. Spend some serious time during summer at the skeet or sporting clay range. Work on crossing and overhead shots to get ready for the dove fields. Early season goose hunters might plan on bringing along a box of nontoxic 7½ shot for the hours when the geese aren't flying. Those harvested small grain fields can be attractive to doves too!

Another nice feature, dove hunting takes relatively little gear to participate.

You can buy some dove decoys to perhaps increase your chances, but a youth or novice hunter can get started with just a shotgun and a couple boxes of inexpensive field loads. A word of caution for starting new hunters: shooting doves will not be easy. When taking a new hunter afield, judge his or her ability and enthusiasm. If they would get frustrated or turned off by an initial lack of success, start with other small game. At a minimum, offer support and wing shooting tips, and don't get their expectations too high early on.

The prolific mourning dove raises several clutches each summer.

(bottom) Hunters need to scout out the routes doves travel from drinking and feeding areas to roosting sites.



STEPHEN J. LANG

### Thinking like a dove hunter

Just like other hunting, the more preparation you put into your dove hunts, the more you will get out of them. Start by walking before the first day of the season with a five-gallon bucket. Sit down, do some scouting, and learn by trial and error. Hunters in southern states have the luxury of more and more doves arriving as winter approaches. Here in the northern latitudes of the mourning dove's range, we will have to spend a little more time looking for that perfect spot; and that perfect spot will change often.

In August, doves start flocking up as they seek feeding, drinking and roosting sites before flying south. Scouting strategy should center on finding these areas and setting up at a good vantage point between where doves fly from roosting sites to





feeding or drinking sites. Doves like to feed and drink where there is very little cover for predators, so look for harvested grain fields and water sources that are partially dried up, places where there is a good strip of bare ground between the water and the surrounding vegetation.

While you're scouting for dove activity, study the birds in flight and learn their characteristics to tell them apart from other birds of similar size. One of the first rules of safe, ethical hunting is to always identify your target before you shoot. American kestrels and killdeer are about the same size and frequent the same habitat. Learn their markings and coloration, then look for wing size and beat as additional clues. Doves have a quick wing beat when cruising in open country. They approach a landing with short pauses in their flapping and draw their wings close to their body. Kestrels can flap as quickly as a dove, but kestrels pause from flapping more often to glide, and they never fly in groups. A kestrel's head is also much larger in proportion to its body than a dove's. Killdeer have longer, narrower wings compared to doves, and flap slower with a noticeable snap to their down

stroke. They rarely glide. Killdeer may be seen alone or in loose groups. Doves may be alone, in loose groups or large flocks. Killdeer are often vocal when they fly, calling out their name *kill-deer*. When doves are within shotgun range, you will often be able to hear their wings whistling, if the wind isn't too strong.

As with turkey and pheasant hunts, most good dove hunting opportunities will be on private land. Unlike turkey and pheasant, the good spots will change from year to year, so remain flexible and always get permission from landowners before entering private property. Understand that because of fieldwork schedules, pastured livestock, or other concerns, you will not always get hunting permission. You will also encounter unharvested fields during much of the season. Be careful not to damage standing crops. These fields should just be avoided. There will likely be less dove activity there and downed birds will be harder to find in taller vegetation. Always represent yourself and other hunters well by treating all landowners and their property with respect. You will meet a lot of nice people along the way.

Once you have permission to hunt a likely looking spot, you have to make some decisions. If you hunt right at the feeding, drinking or roosting site the doves will change their pattern quickly and probably won't be back the next day. If you're not going to hunt doves regularly, these are great places to set up. If you hope to get several hunts from the same area, a better strategy is to find a hunting position somewhere between the dove's daily destinations and pass shoot them. Then let the area rest a few days between hunts. Plan on a bit more scouting time to determine the birds' routine flight paths.

Hunting blinds and camouflage clothing are part of the dove hunting scene, but not as critical as in waterfowl or turkey hunting. Find something to sit or stand behind that will break up your outline, but not block your view of the sky. Dress for the weather in drab clothing. Consider eye and ear protection. If you've picked the right spot, you will be firing your gun more often than you are accustomed to on a typical hunting trip. Which brings us to the next decision...which shotgun to use. If you're like me, you have a 12-gauge that does everything for you. Hitting a flying







JOHN P. BAUERFEIND

Doves are swift, agile fliers. Hunters will need to practice their passing wing shots.

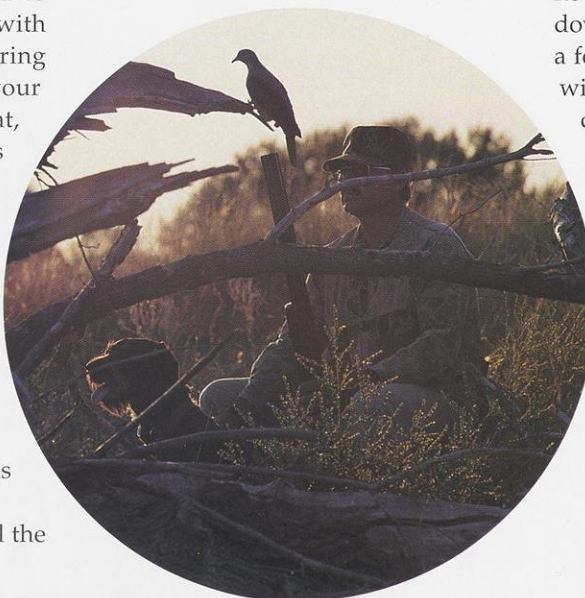
dove is no easy task, and a healthy number of size 8 pellets in a 12-gauge pattern is not over-gunning the bird. If you get serious about dove hunting, you'll want to down-size to whatever gun gives you the most satisfaction. How much do you want to challenge yourself?

Also consider the temperature when hunting early in the season. Wisconsin bird hunters are not accustomed to bringing along a cooler or bucket with ice to store harvested birds, but bring one. It's important to cool down your birds quickly in the September heat, and the right container can serve as your seat while you scan the skies. If you harvest birds, it's a good idea to remove their entrails before you ice them. They will cool down much faster. If you decide to completely clean your birds at your hunting spot, remember the law requires you to keep the head or a wing attached to the body for identification until you get the birds to your residence.

Also, bring insect repellent until the

first hard frost. The best dove action is typically early and late in the day, which is also the best time for mosquito action. And bring water for you and your dogs. Dove hunting is a great chance to get some retrieving work for

If you bring along a dog to retrieve downed birds, make sure you have plenty of drinking water for both of you. The weather is still pretty hot during September into early October.



NEBRASKA GAME & PARKS COMMISSION

your dogs, but they will get hot out there, even though the dogs are not putting miles on their feet looking for the flush or the point.

As the 2003 dove season kicks off, please maintain Wisconsin hunters' long tradition as leaders in wildlife stewardship. Respect for doves and appreciation of the landscapes that produce them will only grow stronger with new opportunities. Also feel good that dove hunters' collective investments in a few inexpensive boxes of field loads will help generate tens of thousands of dollars in excise taxes for federal Wildlife Restoration Funds that are returned to the states for wildlife conservation purposes. So if your wing-shooting skills let you down some day, don't fret. Practice, plan your hunt and enjoy this new opportunity.



Jeff Pritzl is an avid bird watcher, hunter and a DNR wildlife biologist stationed in Mishicot.



continued from page 2

And just as spiders are miniatures, so is their world. A bear may need the better part of a township, or a bobcat a swamp, but these creatures solve every problem that nature gives them with a leaf or two and a point two or three inches away to anchor their web. There are always enough mosquitoes and midges flying about to blunder into the little net that the spider sets up. All it has to do is wait and see what happens, certainly a simple enough life for such a complex creature. Despite the fact that spiders have eight eyes — and on the white ones these stand out like coals stuck in the head of a snowman — their world is limited to these few square inches of leaf and web.

I think spiders portray the concept of a niche, a place to live, to perfection. Any wild community is made up of a multitude of them. A deer may take up an entire woods, or a bird several acres. Then there are those animals that live in a mushroom, or under a stone, or prowl about in a bit of rotting log. The sum total of these makes up a woods or marsh or a field, all of them dependent ultimately on each other.

It has been said that there are sermons in stones. Indeed there are, and also in rotten wood, decaying mushrooms and in rolled up leaves.

*The late Leroy Lintereur was a DNR wildlife manager from 1958–83. For 15 years, he wrote a weekly newspaper column that shared a respect and curiosity about the natural world. We are pleased to occasionally share some of his nature columns.*

A jumping spider makes a meal of a leafhopper in a leafside drama.



DON BLEGEN

## READERS write

### HOMEMADE ENERGY

I enjoyed the two-part energy series. It's interesting that "old Europe" is so much more advanced regarding energy consciousness and efficiency than are we. Our relatively cheap costs for using energy do nothing to stimulate our energy consciousness, efficiency or reduce energy consumption.

Not being content to wait for the future to arrive, about 12 years ago we incorporated a photo-voltaic system into the design of our new house. While we are by no means off the grid, I've discovered, over time, that even a modest solar-electric system can make a meaningful contribution to meeting our total household energy needs, even here during the short, often cloudy, winter days. Also, since I want to maximize the potential use of every solar watt of energy we collect, we've become much more aware of the demand side of the power equation for both our off-grid and on-grid applications.

So while I am waiting for the arrival of a "bright energy future" from the corporate world of energy production, I and others are already taking advantage of the photo-voltaic and wind generator options that are already available and affordable for home installation today. Every little bit helps, as they say, and every time a thunderstorm knocks out the utility power leaving my neighbors sitting in the dark, I can be found happily shooting pocket billiards in my basement illuminated by the bright glow of "sunlight."

Kurt Sroka  
Somerset

### SNEAKY BUCKS

I note glances of doubt every time I tell someone that several times while hunting, I've seen bucks sneak past me in the woods. The deer seem to be walking on their knees not particularly fast with their tails down. We have all seen huge bucks loping with their heads

held high, taking bounding steps, raising a racket and announcing their presence with considerable brush cracking, but not so often do we see the sneaking bucks. Is this an illusion?

Paul Nagel  
Eau Claire

DNR deer ecologist Tim Van Deelen and retired deer ecologist Keith McCaffery responded.

Van Deelen: *I've not heard of the sneaking behavior although deer can be pretty stealthy sometimes. Bucks have evaded hunters by remaining motionless in short/small patches of cover that seem too small to hide a deer.*

McCaffery: *The closest I've been to something like this was when one of our deer party watched a spike buck lower himself into deep grass while a car passed on a firelane. After the car passed, the buck stood up again and slinked across the lane.*

### PLANTS ONLINE

Please let readers know of a greatly expanded website about plants from the University of Wisconsin-Stevens Point Freckmann Herbarium. [Wisplants.uwsp.edu](http://Wisplants.uwsp.edu) contains the latest information about Wisconsin flora including photographs, plant distribution, ethnobotany, discussions of natural plant communities and an easy-to-use identification guide to vascular plants.

The discussions of natural communities include descriptions from DNR botanists Emmet Judziewicz, Eric Epstein and Elizabeth Spencer, noted natural community scholars. The ethnobotany discussions include complete listings by species of how plants were used by local Native American tribes. These were written from oral histories collected from Wisconsin's Great Lakes Ojibwe nation. A new section has also been added describing bryophytes (mosses and their kin).

The identification guide in-



**COMMENT ON A STORY?**

Send your letters to Readers Write, WNR magazine, P.O. Box 7921, Madison, WI 53707 or e-mail letters to [sperl@dnr.state.wi.us](mailto:sperl@dnr.state.wi.us).

cludes a pictorial check-off list where you can choose noticeable traits to narrow down searches and identify specimens. The descriptions of grasses include Agnes Chase's line drawings drawn from Norman C. Fassett's "Grasses of Wisconsin." Check it out.

Merel Black  
Blue Mounds

**DUMPING EFFLUENTS**

As a long-time subscriber, I've yet to see a story specifically about one of the most important environmental issues in our area — dumping of sewage into Lake Michigan by the Milwaukee Metropolitan Sewerage District.

The thought of dumping waste into a source of drinking water is distressing to say the least. I wonder about the long-term possibility of Great Lake eutrophication as well as heavy metal and other contaminants from this continued practice. How serious is the impact of dumping millions of gallons of treated effluent and some untreated sewage? Why don't we hear about a plan to rectify this problem?

Robert Halser  
Palmyra

Local efforts couple with state funding to continually improve wastewater treatment from the state's largest sewerage district. There have been improvements along with setbacks. As noted in our beach safety story in the June 2003 issue, MMSD has dramatically reduced the number of days when rainy weather overloads the treatment system and raw sewage is bypassed to keep

sewage from backing up into streets and basements. Average annual bypassing dropped from 50 incidents to eight and the volume of the overflows has been cut 81 percent since 1994. Nevertheless, the job is far from over and a piece on the district's mixed challenges and successes is worth consideration. Certainly MMSD's management, costs, controls, expansions and technology are widely covered by southeastern Wisconsin newspapers and broadcast media.

**LOW-SALT TRAVEL**

I read with interest the 16 pages or so in the February issue concerning runoff and its effect on our environment ("Slow down in town"). It covered many causes and solutions, but only dedicated a small paragraph to the problem of road salt.

Every year hundreds of tons of salt are spread on our highways and a large percentage of it ends up in streams, rivers and lakes. This is a very serious problem that no one seems to want to address.

Allowing a little more travel time when roads are slippery and spreading a little sand at intersections would help a great deal to reduce this problem. The only positive I see coming from overkill on salt use is for car wash operators. It's about time the Department of Natural Resources takes a look at this problem.

Jerry Johnson  
Ripon

Road salt use and alternative measures that assure safe driving conditions in winter are seriously discussed. Many communities are experimenting with sand/salt/ash mixtures and salt substitutes like CMA that can dry pavement with fewer environmental consequences. State transportation officials also monitor salt use and design highways to retain and retard salt runoff into waterways. Moreover, under the new state rules, pollut-

ed runoff controls will be set to contain road salt, pesticides and runoff from forestry management practices.

**ZEBRA MUSSEL CONTROL?**

In an article on lake sturgeon spawning in Wisconsin carried by The Chicago Tribune the author states that one of the preferred foods for lake sturgeon is zebra mussels. This would be good news because we need to control zebra mussels in rivers and now lakes. Would planting lake sturgeon in big lakes and rivers help? I'd think that Green Bay, Lake Michigan, the Fox River, Lake Superior tributaries, the Mississippi and the Black rivers would be good places to start.

Richard Kortsch  
Milwaukee

*We asked DNR sturgeon biologist Ron Bruch if stocking lake sturgeon might be a significant strategy to control zebra mussels given the sturgeons' long lives, slow population growth rates and the zebra mussels prolific abilities to spread. Here's his response:*

*It is true that sturgeon eat zebra mussels, but our experience here on the Winnebago lakes indicates that the zebra mussels may not be a preferred food of lake sturgeon. Despite the high zebra mussel abundance in Lake Winnebago, the sturgeon here still prefer to eat lake fly larvae and gizzard shad. There may be other waters though where sturgeon would eat more of the zebra mussels, depending on the abundance of other food items. I wouldn't expect that the sturgeon would eat enough to control the zebra mussels in any case.*

**THE LURE OF MUSKIES**

"Long Live the Kings," December 2002, certainly caught our attention. For 41 years, I've never missed a summer fishing "up north," and, in fact, neither have my three children (ages 9,

12 and 14). This might not sound very special to you, but we live in the Sonoran Desert where muskies and fishing do not come up in everyday conversation.

There is great anticipation when traveling to my parents' cabin in Woodruff. We talk non-stop about fishing, who will be the first to catch a fish, what kind, how big, etc. The moment we walk into the cabin, Mike, my middle child, strides over to the mounted record-breaker looking clearly hypnotized and awestruck. What my son dreams of is a monster musky, just like his grandfather's!

Each time we go out fishing, within the first five minutes Mike stares into the murky water and states, "Mom, I feel it. This time I'm going to catch a musky!" He sounds just like my father when he responded to me as a young girl. I explain to Mike that there is only a slim chance of catching one. In your article, that slim chance I was referring to described the musky as being "the fish of 10,000 casts." Due to your "phenomenal job of rebuilding the musky population," my son is confident that this summer he will come face to face with the king of our Northwoods' lake. He's not so overwhelmed now that he knows it should only take 3,000 casts!

Thank you, for your successful musky management plan. My children can keep dreaming about catching the big one. Long live the kings!

Suzanne Rice Schorr  
Tucson, Ariz.

**CHECKING BEACHES ON THE WEB**

The URL for a beach health website listed in our June story "A beachhead for safe swimming," has changed. To view daily water conditions and historical data about water quality testing along Wisconsin's Great Lake beaches, go to [infotrek.er.usgs.gov/pls/beachhealth/](http://infotrek.er.usgs.gov/pls/beachhealth/).



# Wistory

**W**hen the stress of daily life threatens to overwhelm, it helps to take a step back in time. Reflecting on how our predecessors managed to survive and even thrive in the midst of harsh weather, disease, war, and unrelenting physical labor does tend to put 21st century tribulations into perspective. And there are no better places to engage in contemplation of times past than at the Wisconsin Historical Society's sites. From the wanderlust that brought explorers to Madeline Island in the seventeenth century to the ambition that led a family to build the extravagant Villa Louis mansion, the sites embody many characteristics of the pioneer spirit.

At **Villa Louis**, a Victorian-era country estate on St. Feriole Island in Prairie du Chien, visitors can marvel at the effort and funds the wealthy Dousman family lavished on the horsepower of the day. In the early 1880s the family's Artesian Stock Farm bred and raised fine trotting horses for harness racing. The farm soon established a name for itself within the Midwest due to its graceful setting and superlative stable of more than 75 horses. On September 6 & 7 at the **Villa Louis Carriage Classic** — the Midwest's largest and most elegantly appointed competitive carriage driving

event — you can enjoy a pleasant trot back in time. Watch horses harnessed to more than 100 new and restored carriages prance, canter and gallop in obstacle courses and cross-country events. (608) 326-2721.

As word spread of a lead strike in the Wisconsin Territory, Cornish miners crossed the Atlantic in the 1830s and '40s to stake a claim in Mineral Point. The Cornish immigrants' distinctive limestone houses meandering along crooked streets evolved into a neighborhood called "Shake Rag Under the Hill," which resembled a village in old Cornwall. By the 1930s,

many of the homes had fallen into disrepair, but thanks to the efforts of preservationists, some of the houses were restored and now have become part of **Pendarvis**, a Wisconsin Historical Society site. The neighborhood celebrates its Cornish roots on September 27 during **Crowdy Crawn** — roughly translated from Cornish as "entertainment that is a mixture of things." One thing sure to be in the mix is the authentic Cornish pasty, a savory meat pie popular with the lead miners, is served today at Pendarvis area restaurants.

In the days before that famous light bulb flickered on in Thomas Edison's head, folks relied on candles, and oil and kerosene lamps to light the way. **Old World Wisconsin**, a grouping of immigrant farmsteads and a village settlement

located on 600 acres of rolling, wooded hills in Eagle, invites you to bask in soft lamplight glow on an **Autumn Lamplight**

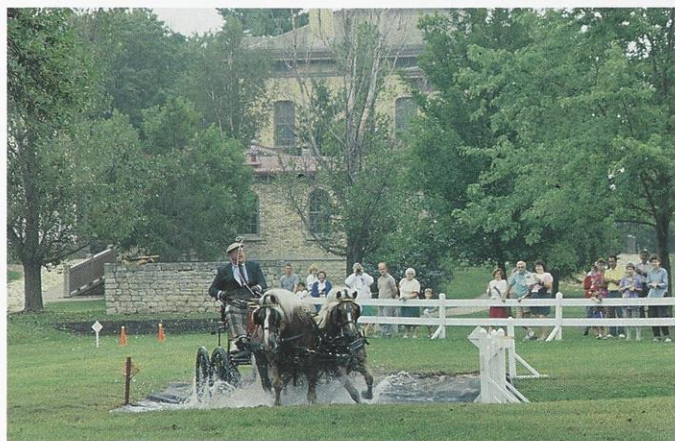
**Tour**. As the sun goes down you'll be immersed in the farm and village life of the 1870s after dark. Lamplight tours will be held September 19, 20, 26 & 27. To make a reservation, contact the Friends of Old World Wisconsin at (262) 594-2922.

Visit [www.wisconsinhistory.org](http://www.wisconsinhistory.org) on the web for details on these and other events hosted by the Wisconsin Historical Society. To build a day trip or weekend getaway itinerary around one of the sites, see the society's "America's Journey" page for the Mississippi/Wisconsin Waterways Heritage Tour, Southeastern Wisconsin Rural Roads & City Streets Heritage Tour, and the South-Central Wisconsin/Native American Heritage Tour. ▀



(above) Restored homes and interpreters restore the feeling of Cornish mining days at Pendarvis.

(below) Watch the horse teams handle the obstacle course at the Villa Louis Carriage Classic.



(BOTH PHOTOS) STATE HISTORICAL SOCIETY OF WISCONSIN



## New skills, old crafts

**I**f you've ever wondered how your great-grandparents (and their parents) managed to survive and thrive in the early rough-and-tumble days of Wisconsin's statehood, then consider participating in one of **Old World Wisconsin's** hands-on workshops. You can learn how to drive a

team of oxen, hammer out a pair of tongs at a blacksmithing forge, plant an heirloom garden, build a log cabin, bake a hearty loaf of German bread from an old immigrant recipe, and more. The authentic trades and crafts are taught as they were practiced more than 100 years ago. In addition to the traditional craft workshops, Old World's curators lead a museum study series covering cultural research, object cataloging and preservation techniques for photographs, textiles, metals and ceramics. For a workshop schedule and registration details, visit [owwwisconsinhistory.org](http://owwwisconsinhistory.org) or call (262) 594-6300.



## Wisconsin, naturally

### OBSERVATORY HILL STATE NATURAL AREA

**Notable:** This site is a “monadnock,” an isolated remnant of a once lofty mountain range composed of erosion-resistant rhyolite rock estimated to be 1.75 billion years old. On the dry, exposed, 300' high summit are rock surfaces polished and grooved by glacial ice that passed over the hill 12,000 years ago. Lichens, red cedar and prairie species now vegetate the top. The hill was a favorite childhood haunt of naturalist John Muir, who lived nearby.

**How to get there:** From the intersection of Highways 22 and F on the south side of Montello, go south on F 4.8 miles, then east on 14th Rd. 0.5 mile, then south on 13th Rd. 1.4 miles, then east on Gillette Ave. 0.6 mile to a parking area north of the road. A footpath to the summit begins at the NW corner of the old field. *Wisconsin Atlas*: page 44, grid C2.



TO SUBSCRIBE CALL 1-800-678-9472