Wisconsin natural resources. Vol. 14, No. 6 December 1990

Madison, Wisconsin: Wisconsin Department of Natural Resources, December 1990

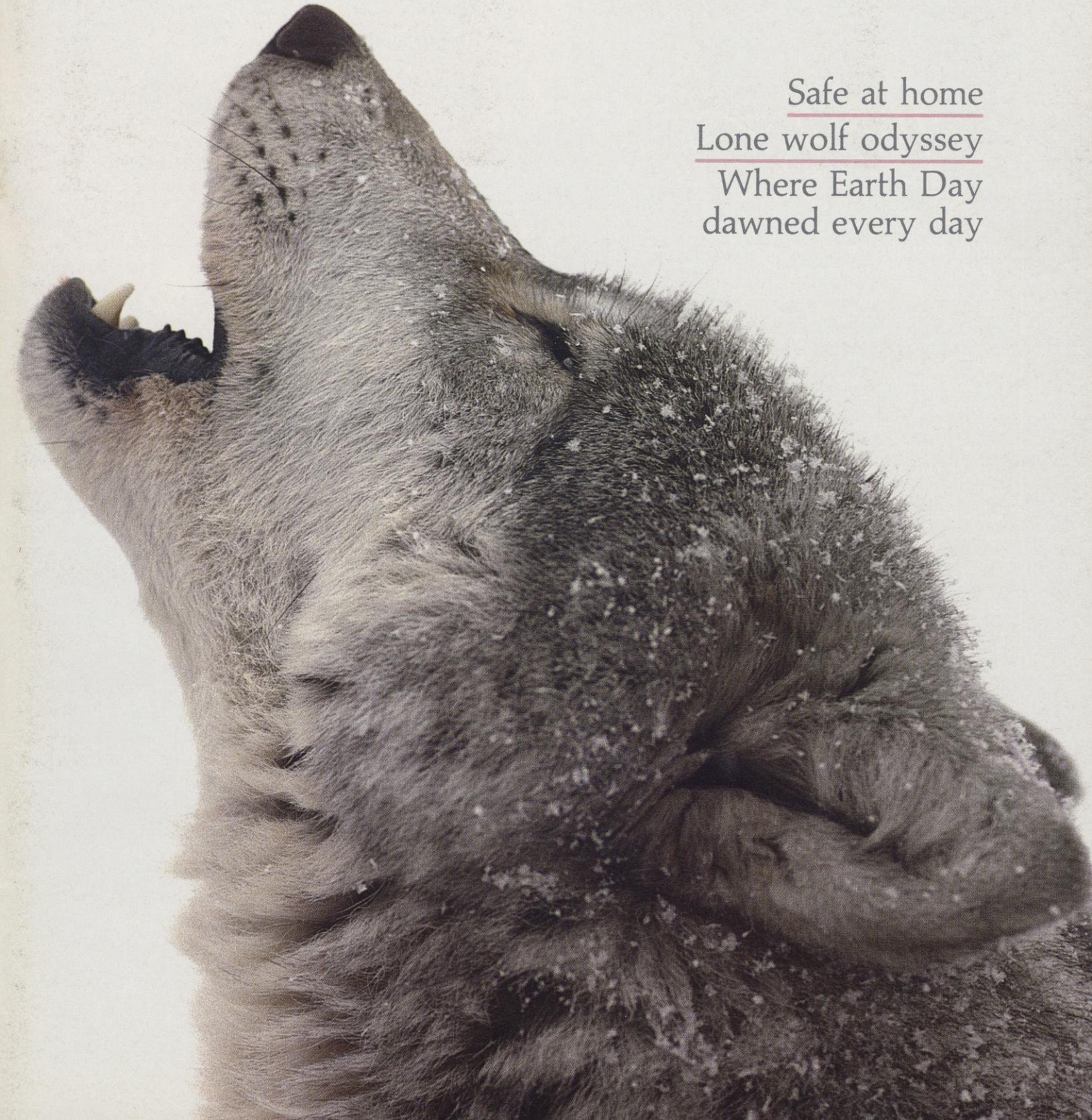
WISCONSIN NATURAL RESOURCES

December 1990 $3.00 Volume 14, Number 6

Safe at home

Lone wolf odyssey

Where Earth Day dawned every day



Frosty Flights of Fancy

Anita Carpenter

A blanket of frigid arctic air settles over the frozen countryside. The wind is still and the stars sparkle in a cloudless sky. Tonight will be a time of magical creativity when windowpanes are transformed into ice paintings.

Viewing these paintings on a cold morning, I may imagine I'm transported to a tropical underwater seascape, complete with giant kelp, sea fans, coral and colorful angelfish. Other mornings I see tropical forests with giant ferns, intertwined vines, orchids and butterflies. Some days I even see Rocky Mountain alpine meadows studded with windswept, gnarled evergreens.

We are all familiar with frosted windows that block our view of the wintery world. Have you wondered how and why this frozen phenomenon occurs?

Frost is a covering of ice produced when the air temperature dips below freezing and supercooled water droplets freeze on a surface colder than 32°F. The air must be still, otherwise the warm daytime air mixes with colder night air and keeps the water droplets from supercooling.

As nighttime temperatures drop, cold air cannot hold as much water vapor as warmer air. Frost forms at the frost point just as dew forms at the dew point, except the tempera-

continued on page 39

WISCONSIN NATURAL RESOURCES

December 1990 Volume 14, Number 6

PUBL-IE-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 monies or license monies are used. **Subscription rates are:** $6.97 for one year, $11.97 for two years, $15.97 for three years. Second class 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. Toll-free subscription inquiries will be answered at 1-800-678-9472.

4 WHERE EARTH DAY DAWNED EVERY DAY
Coggin Heeringa
The whole community pitched in to give its kids a year-long natural education.

8 SNOW TRACKS IN THE SUNSET
Maureen Mecozzi
Candlelight skiing adds sparkle to winter nights.

9 EarthNotes
Contemplating our journey with an eye to the future.

16 LONE WOLF ODYSSEY
Karen Vermillion
Journey with us in search of a wild wolf.

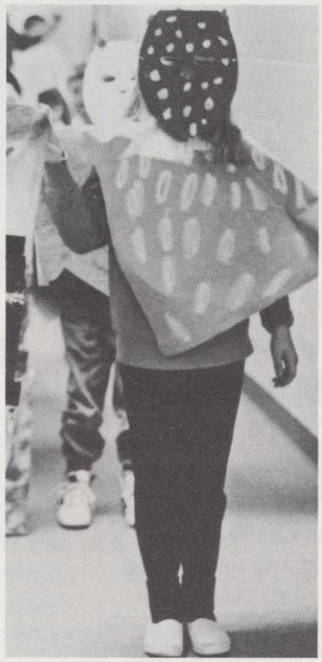
19 PRESERVING A LOOK AND A LEGACY
David L. Gjestson and Mark E. Cupp
The aim is maintaining a sense of wildness on a 92-mile ribbon of land and water.

20 SMALL PACKAGES
Maureen Mecozzi
A pocket-sized gift to appreciate trees in winter.

26 A SECOND CHANCE
Charlene M. Gieck
Nearby, there's a healing center for wounded raptors.

35 SAFE AT HOME
Elaine Andrews and Liz Wessel
Old-time cleaners can cut the hazards of household chores.

FEATURES
29 Wisconsin Traveler
39 Readers Write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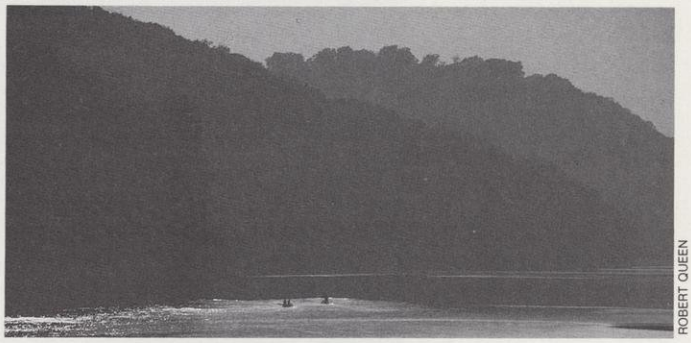
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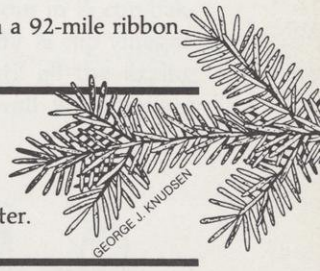
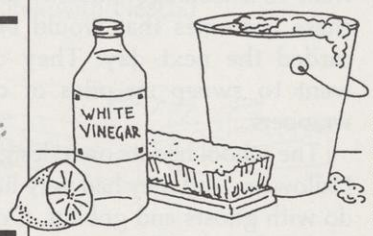

GEORGE J. KNUDSEN


THE RAPTOR CENTER



HAWLEY W. WRIGHT

FRONT COVER: © MONTY SLOAN, Wolf Park, Battle Ground, Ind.
BACK COVER: © JIM BRANDENBERG, Minneapolis, Minn.

BARBARA MULVANEY

GIBRALTAR AREA SCHOOLS

Denny Olson as Critterman kicked off the PROJECT EARTH school year.

Where Earth Day dawned every day

A year-long project at Door County's Gilbraltar Area schools infused environmental themes throughout the K-12 curriculum.

Coggin Heeringa

It was Halloween time. Administrators, teachers and parents in Door County's Gibraltar Area School System were reluctant to sponsor the traditional school parties. They didn't want to encourage students to purchase costumes that would be discarded the next day. They didn't want to sweep up piles of candy wrappers.

The school had its own designs on Halloween, and they had very little to do with ghosts and goblins. October 31 was designated " Endangered Species Day" and a whole day of special treats was planned.

The celebration was one in a series of activities permeating the school curriculum with environmental studies that reached every student for a full year. In fact, the entire northern Door County community stretching from Fish Creek north through Sister Bay, Ephraim, Ellison Bay, Gills Rock and southeast through Rowley's Bay and Bailey's Harbor got involved in the school district's PROJECT EARTH program.

This northern arm of Wisconsin jutting out into Lake Michigan is naturally scenic and beautiful. Most of the citizens here have a deep love for nature and feel a heavy responsibility to protect their fragile peninsula.

Educational supporters are equally committed. The Friends of Gibraltar (FOG), a network of locals who support excellence in education, promote activities to link the schools and the community. FOG had funded a number of innovative programs, and PROJECT EARTH seemed a natural.

In September, assemblies at the elementary, middle and high schools introduced students to the year-long environmental theme. Nationally-renowned naturalist/entertainer Denny Olson visited the school as his alter-egos: Critterman, Professor Avian Guano and The Lost Voyageur. Olson's costumed characters had students laughing at one of nature's most serious lessons — that all living things are interconnected.

Inspired by the experience, elementary students and their teachers launched into a month-long study of

endangered species. Students studied wildlife during their science, reading, math, language and social studies classes.

Lessons were not confined to the classroom. Each grade school class was bused to nearby Newport State Park. Working closely with the teachers, the park naturalist developed activities designed to incorporate environmental themes in academic subjects taught outdoors.

"It didn't seem like schoolwork," wrote one third grader after participating in The Ticket Game (from the Project WILD program), "but now we know all about camaflaje [camouflage] and how hungry you get if you are a Prediter [predator]."

"I liked the habitat game the best," another student explained, "and doing math in the park was good because it was about real stuff."

A fifth grader confessed, "I like writing the poetry because nature is too pretty to use ordinary words."

Preparations for Endangered Species Day intensified as October neared its end. Kindergarten through third grade students each chose a favorite endangered animal and designed masks during art classes.

Using information from their written reports, the fourth and fifth graders created block prints, banners, fabric batiks and an exquisite appliqued quilt.

© SUZI HASS

"Seas of Sweet Water," in homage to the Great Lakes; one of several original environmental compositions premiered throughout the year in school concerts.

October 31 was indeed festive, but the costume parade featured child-made animals masks, not goblins. A park naturalist presented a slide talk about bats, and party games followed the wildlife theme.

For the older students who wanted to be "at least sort of grossed out on Halloween," Peninsula State Park Superintendent Tom Blackwood read passages from "Never Cry Wolf."

The environment in the middle school and high school had a decidedly musical tone as jazz composer John Harmon and the Wolf River Quartet began a four-week arts residency with an all-school concert.

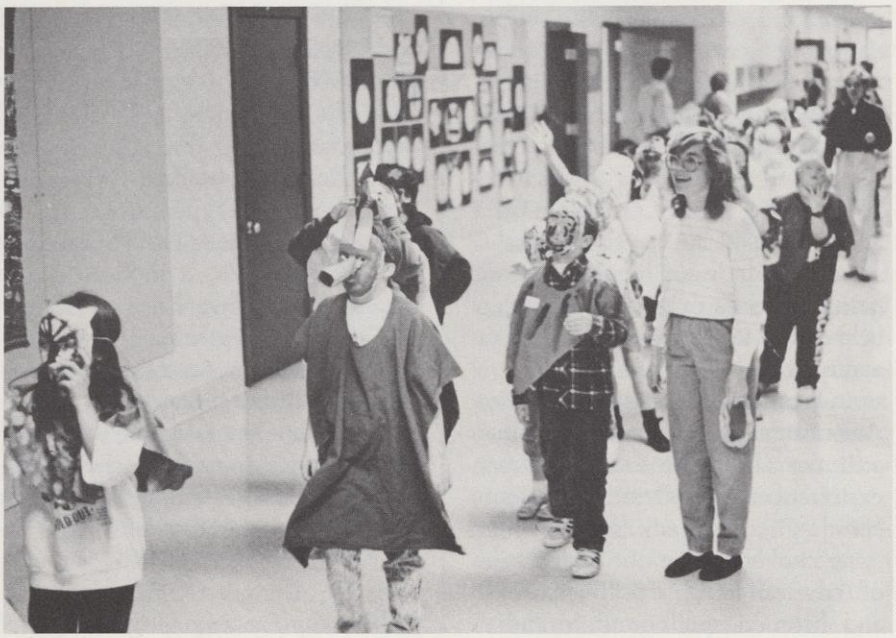
Harmon spent a week working with music students in October, but his most noteworthy magic happened in the English classes. A piano was wheeled into a classroom and the jazz musician improvised a gentle accompaniment to readings on environmental topics.

Then in a turnabout, Harmon played the piano as students wrote poetry. The product:

"I Am the Glad Earth"

I am the Glad Earth; fragile yet strong,
singing of tall trees and deep lakes and rivers swift and long.
I am the sweet Earth, home to all,
sheltering all God's creatures great and small.
North wind brings the cold; winter's drear.
Then warm sun melts the snow, flowers reappear.
I am the glad Earth fragile yet strong!
Singing my joyful song! Singing my joyful song!

A Halloween bash celebrated wildlife rather than ghosts and goblins. Younger elementary school students crafted masks of their favorite endangered animals then paraded through the halls.



GIBRALTAR AREA SCHOOLS

High school groups dealt with some very serious topics during October. Becky Leighton of the Lake Michigan Federation spoke to the consumer education classes about water quality in the Fox River and Green

Bay and discussed ramifications of wetland loss.

Dr. Josephine Meeker, a geology professor from Ontario, spoke to a mixed audience of students and adults about the Niagara Escarpment, the prominent geological formation that gives Door County its unique character and look. She described natural and historic resources of the Bruce Peninsula, the Canadian counterpart to Door County.

District-wide education projects of this scope don't just happen. An amazing array of donors including the school board, corporate and charitable foundations, private citizens, environmental organizations and even the high school's Class of '44 wanted to show they were still interested in the school and its programs for today's children.

FOG hired two dynamic women, Peg McCarty and Mimi Wohnrade, as PROJECT EARTH coordinators to develop activities and special programs with teachers that correlated with monthly environmental themes.

November was designated Recycling Month. Naturalist/musician Mary Spaulding spent her artistic residency at the elementary school sharing her love of nature and teaching the value of reusing discarded items. At the end of her stay, students presented a "trashy" concert in which teachers performed the "Decomposer Rap."

During art classes in November, visiting artist Kirstin McClintock and 15 adult volunteers taught elementary students how to make paper from recycled fibers.

Even the most traditional classes focused on the natural world. Junior high and high school students selected environmental topics for research papers. Some students resented having a term paper topic "forced" on them, but as they delved into the research, many became devoted environmentalists.

The young people had a worthy role model. Consulting ecologist Dr. James Zimmerman spent December and January helping English classes select thought-provoking research topics, leading science field trips to Peninsula State Park and lecturing to civics and social studies classes. Zimmerman inspired classroom teachers and students alike to craft an original document: a Declaration of Interdependence.

GIBRALTAR AREA SCHOOLS

Getting down to artistic basics: In November, students had fun making paper from recycled fibers.

Meanwhile, junior high students learned interviewing and research techniques by meeting with a variety of natural resources professionals. Students gathered information, wrote papers and produced public service announcements about natural resources for the local radio station.

In the new year, elementary teachers continued to infuse monthly environmental themes into the curriculum. During Clean Air and Water Month, a DNR interpretive naturalist set up groundwater demonstrations in every classroom. Sixth graders held classes in Newport State Park on a very snowy January day.

In February, classes studied Native American cultures focusing on Indian attitudes about the Earth. Children experienced the Oneida Museum Hands-On Program, made Indian bone chokers under the supervision of American Indian artist Sheila Smith and listened spellbound to Indian storyteller Amos Christjohn.

"Things With Wings" was the theme for March, so naturalists from Bay Beach Wildlife Sanctuary, The Ridges Sanctuary, and the state parks spoke to elementary students about birds and insects. High school students built and will monitor bluebird boxes with assistance from the Bluebird Restoration Association of Wisconsin and heard about gypsy moth research.

Gibraltar Area Schools joined worldwide Earth Day celebrations in April. The school sponsored poetry readings, folksinging and a clean-up/appreciation hike through Peninsula State Park. Special Earth Week programs included performances of "Animal Faire" and "Earth Speaks" by DANCECIRCUS, a modern dance troupe from Milwaukee.

Gibraltar's Earth Day concert included art displays and the world premiere of several pieces. Artist-in-residence John Harmon and his Wolf River Quartet joined the school's music program in presenting "Fanfare for the Blue Planet," "Seas of Sweet Water," "Tuning of the Earth" and "Peninsula." The quartet provided musical backup for a moving reading of

the "Declaration of Interdependence." Few eyes remained dry when the combined choirs and instrumentalists performed a student-arranged rendition of "I Am the Glad Earth."

On Arbor Day, tree seedlings were distributed to fourth graders here and across the nation.

Was Gibraltar's PROJECT EARTH a success? Youngsters wrote to the President about environmental issues. The student council passed a resolution discouraging the use of polystyrene in the school and the district developed a nature area.

The younger students were enthusiastic about their special programs and field trips. Most, though not all, high school students acknowledged their environmental research had been valuable.

Teachers selected an international theme for the current school year and plan to study global ecology with their students.

It remains to be seen if PROJECT EARTH's initial success will continue into the future. When Gibraltar students grow up to be land owners, when they sit on county planning boards, when they are elected to state legislatures or become bureaucrats, when they consume and vote and develop their own land ethics, then we will know.

These Door County youth will inherit "The Glad Earth, fragile yet strong." Thanks to concerned teachers, parents, FOG and community volunteers, odds seem better that they will grow to adulthood "singing Earth's joyful song."

Author Coggin Heeringa serves as park naturalist at Newport State Park in Door County.

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© SUZI HASS

(top) Throughout the seasons classrooms moved to state parks in Door County. Everyday lessons got an environmental slant with help from the park naturalist.

(bottom) At Newport State Park the sixth graders were encouraged to teach the kindergarten classes as everyone combed the beach.

SNOW TRACKS IN THE SUNSET

Candlelit trails under a starlit sky keep state parks a playground even on a winter's night.

Maureen Mecozzi

It all started four years ago after Gerald Trumm had a rendezvous at a little motel in Lake Delton.

Things were never the same after that. Just ask the neighbors. Plenty of weird stuff going on over there in Mirror Lake State Park, they said. Ol' Superintendent Trumm out in the dark woods, laughing in the moonlight when it was below freezing, setting out candles in the snow! And that sound . . . schuss, schuss, schuss. Had to be devil worship or some such thing.

continued on page 13

Candlelit trail at Mirror Lake State Park. JOHN MOLINE

ISSUE 6

EarthNotes

REFLECTIONS AND SPECULATIONS ON ENVIRONMENTALISM FOR THE 1990s

This is the end of our Earth Notes journey. We've shared snapshots of important times and issues from our environmental past. In recounting our historic travels, we've shown how concerns about water quality, soil preservation, air quality and waste management reflected the social, political and economic environments of the times that shaped them.

In this edition, we fulfill our final promise: to share strategies to meet environmental challenges we anticipate in the 1990s and into a new century.

Speculating about the future requires additional tools and different skills than reflecting on the past. You have to understand current directions, assess present policies, research foreseeable changes, project trends, communicate with leaders of successful institutions and businesses. It might interest you to learn that a band of DNR staff with just such interests meets as a Trends Analysis Group to advise managers on environmental, demographic, energy and lifestyle issues.

The strategies noted here were gleaned from planning documents, Earth Year commentaries and Secretary C.D. Besadny's provocative listing of critical issues for the next decade. Our strategies build on our strengths: an industrious work force, people who still prize outdoor recreation, an economy strongly tied to natural resources and a growing appreciation of environmental skills.

Strategy one: Enhance our environmental skills

When most Wisconsinites worked farm fields, logged timber and conducted commerce in riverbank communities, people regularly explored fields, streams and forests. Through the 1960s and 1970s family vacations focused on camping, hunting and fishing.

The family has changed, as have our livelihoods. One-parent households are common, most of our jobs are in cities and more of our recreation time is spent close to urban centers. We run the risk of losing touch with nature. We have fewer direct experiences observing plants and animals contend with natural cycles — birth, death and the search for food, water and shelter.

Now we are challenged to teach urban children how nature works in the city: How water, sun and nutrients vary seasonally and cyclically in yards, parks, public shorelines, artificial ponds and nature trails. Programs emphasizing wildlife and forestry in urban areas are already underway.

Our strategy? First, make conscious decisions to explore the vast network of public parks, lakes, flowages and forests where children can get closer to nature. Second, **educate for survival.** We need to judge and understand the environmental consequences of our everyday actions.

ROBERT QUEEN

Students test water chemistry in a suburban wetland. Teaching children that environmental cycles are relevant to city life can influence their decisions and lifestyles as adults.

Environmental decision-making at home and in school can mold our lifestyles as men, women, employees, parents, consumers, voters, business managers and landowners. The skills we need to make these environmental choices should be woven in with other skills we teach youngsters — math, sciences, social sciences, arts and physical skills. Moreover, we need to work with adults so environmental lessons are interpreted in values instilled at home. Our goal is to foster wise

uses of air, land, water, energy and biological resources in commerce, industry, agriculture, public services and personal activities.

Change individual habits — Large-scale environmental abuses by industries prompted our first wave of environmental regulations. We cast our regulatory "nets" to capture major polluters. The second time, we aimed to resolve environmental problems caused by municipalities and smaller businesses. Further environmental improvements will likely come from curbing the smaller amounts of pollution that each of us makes. Changing the individual's habits will require different strategies then regulating industries. We will have to examine whether governmental agencies or other institutions can most appropriately handle these tasks. Likewise, we will need to spend more time and money on rewarding appropriate environmental behavior rather than developing regulations and penalties. We will need to teach people why the price of consumer goods must include a cost for disposing of those goods that are not being reused or recycled.

Encourage public participation in environmental decisions — Environmental officials can forecast challenges and propose solutions, but predictions will always be at least a little wrong. Adjusting our positions midcourse requires carefully listening to our critics and including a diversity of opinions when making environmental decisions.

Emphasize urban sources of pollution — People are concentrating in cities and our greatest remaining pollution problems are concentrating there as well. More attention will be paid to curbing stormwater, urban runoff, sediment control, air toxicants and indoor air pollution. Other uniquely urban environmental predicaments will undoubtedly be "discovered" and receive attention as we continue the search.

Just as we plan our infrastructure of roads, communications, rails, sewerage systems and water supplies, so we must holistically plan "infraservices" like garbage collection, erosion control, snow and leaf removal, recycling and public health.

Take global responsibility — Local actions in our communities contribute to global warming, ozone depletion, tropical deforestation and over-consumption. We need to reexamine and change aspects of our lifestyles that provide convenience at the expense of environmental degradation elsewhere. Moreover, we should actively share pollution solutions developed here with other regions and other countries.

BRENT HAGLUND, COURTESY OF THE NATURE CONSERVANCY

Clifford Messinger

View all our actions through an environmental filter — As eloquently captured by former Natural Resources Board Chair Clifford Messinger:

Environmentalism, to those afflicted with it, grows into a world view. It takes the pulse of life on Earth and assesses the role of modern humans in the larger scheme. It interprets history biologically as a flow of energy and other resources through living systems and it tries to determine whether a new technology will enhance or imperil those resources. It is a way to judge economic and political systems from the point of view of preserving the Earth as a flourishing house of diversity.

In short, environmentalism is a system of ethics, and as such it comes draped with all the ambiguities and personal pitfalls that characterize any ethical system, whether it be religious, economic or political.

Strategy two: Sustain and enrich biological resources

Maintain natural diversity — Bioengineering/genetic engineering may lead some to conclude people can artificially create diversity and strength in gene pools. We do not agree with this assessment. We support maintaining a widespread and robust diversity of naturally reproducing organisms. The foundation of genetic stability lies in maintaining this natural, wild diversity of all organisms. We need to shepherd the concept of an environment that's clean, healthful, attractive and diverse.

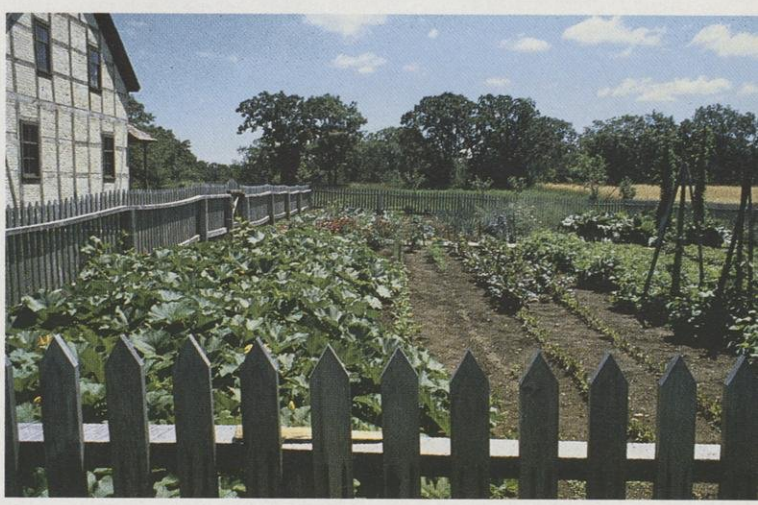
Preserve and conserve water — Clean water is integral to many of Wisconsin's most important businesses — manufacturing, dairy farming, papermaking, food production. Our water supply is large, but we are not immune to natural flood and drought cycles. Our water supply is clean, but it is not shielded from contamination. We must continually monitor groundwater quality and take even greater vigilance to prevent groundwater contamination. We must reevaluate the widespread use of surface water to carry wastes and dilute pollution. We should likewise foster greater stewardship of wetlands, rivers and streams.

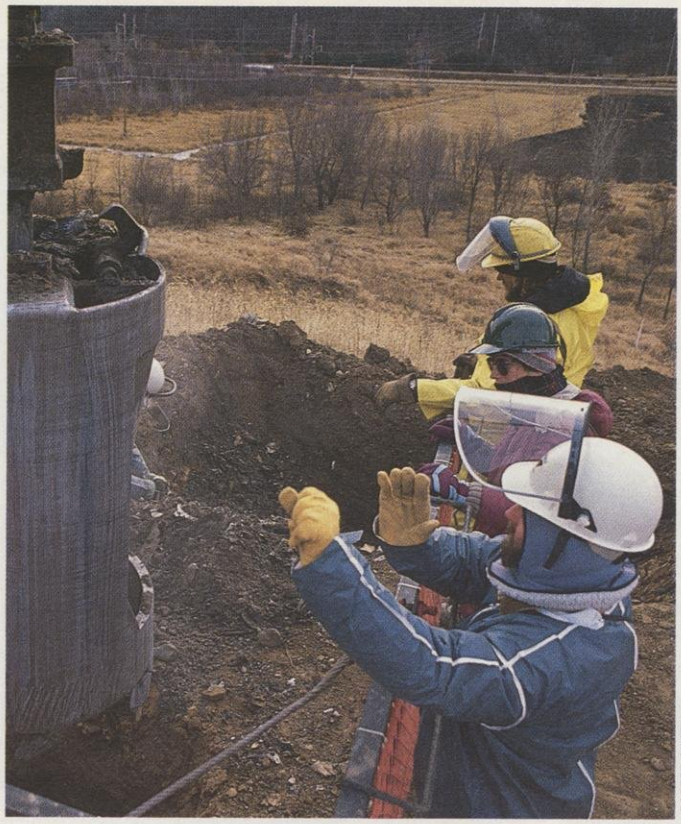
Revere soil — Our lives are sustained between a thin layer of breathable air and an even thinner layer of soil. Environmentalism since the 1970s has taught respect for clean air and water, but we still treat the land like dirt.

Protecting soil includes paying attention to both land cover — crops, trees, pavement — and land management practices. We should strive to add to our dwindling soil base. There is little solace in merely slowing the rate at which we wear away earth and create destructive sediments. Our strategy? Promote sustainable agriculture on farmlands, encourage forest management that equally regards timber and soils as forest resources and teach sustainable development and redevelopment in urban areas to curb urban sprawl, protect shorelines and preserve public green spaces.

Strategy three: Sharpen environmental tools

Practice pollution prevention, put a price on environmental costs — Billions of dollars and a great deal of time are spent correcting and improving hazardous waste sites, contaminated water supplies, leaking fuel tanks and disposing of hazardous residues. To avoid past mistakes laws, attitudes and behaviors in the marketplace must change. We must economically and socially reward those who prevent pollution by reducing the hazardous compounds they use or by reusing wasted materials. We must squeeze every bit of use out of materials, then manage the residues in an environmentally sound manner.





ROBERT QUEEN

Costly monitoring wells and gas vents are installed around an old landfill site. Preventing pollution, reducing wastes and treating residues before disposal are part of the waste management solution. The price paid for products and services should include the true costs for handling wastes and maintaining landfill sites.

Manufacturers will bear greater responsibility for the products they produce and consumers will bear a greater portion of the costs to recycle or discard of the products they use. The price tag on goods and services should include the costs of environmental cleanup and environmental liability so future generations will not end up paying the bills for our consumption.

Develop environmental strategies that reflect back and look ahead — Comprehensive environmental programs must aim to both correct past problems and prevent future contamination. Studying the social, economic and physical factors that mold environmental actions will warn us against repeating past mistakes while building on positive solutions.

Consider combined environmental effects — Environmental officials should ensure that air, water and land protection are considered equally when environmental solutions are proposed.

Environmental trends

Tomorrow's headlines and history will recount the great environmental battles, calamities and successes of the next decade. Here, we note some opportunities and underlying factors that are hard to capsulize in the day's events.

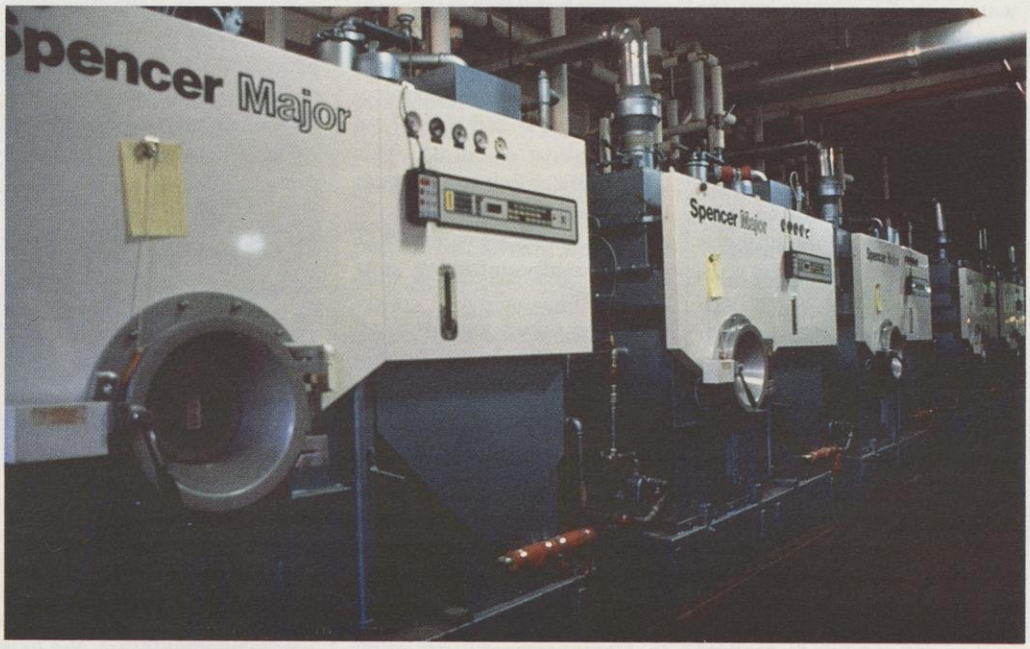
Small will keep getting smaller — Technology will provide even more sophisticated means of monitoring and measuring minute amounts of environmental contamination. Environmental staff, health professionals and reporters should work together to weigh risks of exposure without presupposing which risks the public will choose to accept.

Fewer and fewer items will be guaranteed to be "safe" — As we can detect smaller and smaller concentrations of contaminants, we will raise more questions about health risks associated with chemicals and natural substances used by households, business and agribusiness. We will need to assess these risks rapidly and rationally. We should not be jaded by these findings. It's important to examine how compounds are transported in the environment, how we are exposed to chemicals and which chemical exposures may harm people and the environment.

A clean environment is good business — Environmental goals are compatible with a strong economy. Wisconsin's steps to protect people from environmental problems long before federal mandates or money dribble into the state have saved us millions of dollars: sewage treatment plants were rebuilt before inflation soared, both tourism and our paper industries expanded when clean water was restored, programs to separate combined storm and sanitary sewers started years ago would likely be unaffordable today. We enacted acid deposition controls and our utilities will amass sulfur dioxide credits which may be worth tens or perhaps hundreds of millions of dollars as national acid deposition controls are applied.

¿Habla environment, Senora? — In the next 20 years minority groups will not be in the minority. By the year 2000 nearly one in every three U.S. residents will be a member of a group traditionally classified as a minority. We have tremendous opportunities to discover and appreciate environmental themes woven into the fabric of other cultures. The opportunities for sharing different cultural approaches to environmental stewardship are largely unexplored.

Validating the green seal of approval — Societal concerns about potential environ-



ROBERT QUEEN

A clean environment is good for business, especially the cleaning business! By installing efficient dry cleaning equipment, Spic and Span of Milwaukee reduced solvent emissions and saved emission credits that can be sold to other companies.

mental risks make people targets for environmental marketers. Some purport their products are safe for the environment. Others are selling environmental filters that reportedly protect against radiation and contaminants in air, water and food. Environmental experts will be expected to assess these claims for consumers as well as offer advice on environmental testing services and determine when environmental risks warrant individual action.

- Environmental know-how is a marketable product — The expertise needed to resolve environmental challenges spawned a new profession — environmental consulting. Wisconsin's roster of environmental engineers and consultants is one of the strongest in the United States.

Delegations from the Soviet Union, Norway, New Zealand, Canada, Germany and the Pacific Rim countries visited the Badger State in 1990 to study our environmental technology and environmental systems. Wisconsin environmental experts made presentations in Sweden, Scotland, Central America, Lithuania, the Soviet Union, Quebec, Switzerland, Colombia and India during the last year or so.

Wisconsin companies manufacture pumps for community water supplies, equipment for handling solid waste and for processing hazardous waste. Our opportunities to globally market Wisconsin environmental skills are an exciting prospect.

- The manufacturing loop is closing — Manufacturing is becoming a less wasteful business, by choice and necessity. Increased disposal costs, incentives for recycling, litigation of laggards and increased praise for socially responsible firms are making environmental "friendliness" another cost of doing business.
- You pollute, you pay — We forecast increased use of environmental fees as a disincentive for waste production and as an incentive to produce goods and services economically. As tax revenues are spread thinner and thinner, society will expect those who produce wastes to pay more of the freight for environmental restoration.
- More environmental matters handled locally — Teaching and empowering local government to oversee environmental regulations is sensible. Some responsibilities for inspecting water supplies, wetland protection and floodplain management already have been delegated to counties. This trend will continue as communities develop local expertise to provide local services while professionally enforcing state standards.
- The urban environment, our next environmental frontier — Through pollution control programs, forestry, wildlife management and recreation, the city is a future hotspot and a largely unexplored frontier for natural resources management. Changing family structures and further concentration of people in urban areas mean that environmental programs and outdoor recreational opportunities need to be developed closer to home. We see this as a chance to foster environmental stewardship in city dwellers and challenge natural resource professionals to interpret environmental and resource management programs in urban settings and on private lands.
- Exploring the sociology of ecology — As environmental programs expand to encourage responsible personal behavior as well as corporate behavior, we need to offer meaningful incentives that will attract people and garner support for environmental protection. Public accolade and scorn are both powerful societal tools, every bit as powerful as legal systems and regulations. We need to better understand how to frame environmental goals in sociological terms.

JEFF SMOLLER

A environmental manager in the soviet republic of Tartar shows treated wastewater at his Kazan chemical factory to DNR officials Lyman F. Wible (second from left) and Secretary C.D. Besadny (right). Wisconsin environmental officials were invited to the industrial soviet republic to forge agreements sharing pollution control technology and natural resources management strategies.

A last look

So our travels that began with compass and binoculars end with a clearer vision of our environmental future. We have taken a magnifying glass to the last 40 years. We have spotlighted charismatic individuals and catastrophic events. We've pondered our past and our future.

We intended to entice you to make private journeys through environmental history. Take that journey on a scale that's practical for you. One person can't slay all these dragons, but each of us can meet at least one of these challenges. Make time to delve deeper into those environmental issues that intrigue you. Visit libraries to extract historical clues that influenced environmental policies in your community. Explore the court records, photos, news accounts, diaries, films and books that can give you a clearer picture of some environmental issue people resolved or left unresolved as we shape an environmental future.

Earth Notes is produced by the Division for Environmental Quality, Wisconsin Department of Natural Resources, P.O. Box 7921, Madison, WI 53707

PUBL IE039 90

continued from page 8

Then the newspapers got hold of the story. And pretty soon a couple hundred people came to Mirror Lake to schuss after dark.

Candlelight skiing was born.

Other Wisconsin state parks took up the wick. Now, in addition to the candlelight cross-country skiing nights at Mirror Lake, skiers can glide down softly lit tracks at 18 other state parks and forests.

But wait a minute, Supt. Trumm — what about that meeting at the motel?

"Well, we wanted to bring more people into the area in winter," he says. "Tourism is always good here in Lake Delton and Wisconsin Dells in the summer, but not much happens after the weather turns cold. I had this idea that candlelight skiing would bring people to the area to stay overnight. So I talked with Lester Bremer at the Pioneer Motel to see if he might be interested in helping us start up."

Bremer agreed to donate funds for the candles and reprints of ski maps. Trumm chose two easy trails, one a mile long and the other eight-tenths of a mile, for the candlelight excursions.

"We thought it'd be a simple enough thing to do, but it ended up being kind of complicated," Trumm says. He purchased commercial candles in cups, but the candles were too small and couldn't hold a flame. Not about to be snuffed, Trumm sought illumination from his staff. They experimented with different waxes and longer, thicker wicks. "Not everything worked," Trumm said. "But we've got it down to a science now." The Mirror Lake Waxworks — staffers Dan Farrar, Lyle Reinfeldt and Kenneth Lane — can knock out a couple hundred candles an hour. "It's recycled wax," Trumm notes with pride. "Canning companies use it first, then we get it."

Over 400 candles are needed to light a mile of trail. Volunteers help place and light the candles.

Trumm says candlelight skiing requires no special skill or technique. "Just remember the 'light on right' rule: Keep the candles on your right side to prevent going the wrong way on the trail. And give a holler if you fall to let other skiers know where you're at."

The skiing's fun, but many late-night visitors to Mirror Lake find the afterglow even more enjoyable. Strangers become fast friends around the blazing campfires in the park's picnic area. Trumm encourages moonlight chefs to bring along the makings for a late supper and use the large lit charcoal grills for roasting hot dogs, hamburgers, bratwurst, marshmallows or perhaps a nice sirloin, medium rare.

Mirror Lake plans to hold three candlelight ski nights this season: Saturday, January 5 and Saturday, January 19, plus a special "Groundhog Night" ski on Saturday, February 2, weather permitting. At Mirror Lake (or any other park) it's best to call either the day before or the day of the night ski event to check on snow conditions. Admission: A Wisconsin State Park sticker or daily tag. Candlelight skiing usually begins about 6 p.m.

Other parks also collaborate with local community groups to make winter nights less fearsome and more fun. The Friends of Lake Wissota State Park have helped Superintendent Allen J. Middendorp host candlelight ski nights for the past three years. "They set up the trails and sell hot drinks and soup to skiers," he says. "And that's no small feat — we've had nights with 600 people skiing if the weather's good." Lake Wissota's candlelight skis on 2.8 miles of trail will be held Saturday, January 5; Saturday, January 26; and Saturday, February 23.

Willow River State Park joined the Hudson Chamber of Commerce last year to participate in the Hudson Hot Air Affair, a weekend event featuring hot air balloon races and outdoor recreation like snow golf, snow volleyball . . . and candlelight skiing. "The first night of the Hot Air Affair (Friday, February 1) is our open house," says Superintendent Mark Kubler. "The candlelight skiing is free that night — no admission sticker or tag is necessary." Kubler converts the park's nature center into a warming house where skiers can soak up the Btus before going around again on the 1.5 mile lit trail. And if you haven't got a date for New Year's Eve

© ERIC MOSHER

Quiet trails take on a romantic glow as flickering candles reflect orangy sunsets, deep blues, then act as beacons under starry skies and moonlight. Candlelight schussers keep the lights on the right to avoid nighttime encounters with trees or other skiers.

ARTHUR MILLHOLLAND

ARTHUR MILLHOLLAND

It's not just for lovers. Candlelight skiing offers a fun weekend outing for the whole family. The courses are generally less than two miles and picnic areas are open for a weenie roast, barbecue and a campfire. Bring your clan or a whole gang of friends.

Or make a weekend of it and plan an apres-ski agenda of a sauna, dinner and dance in a nearby community.

(or even if you do), Kubler suggests you spend the last night of 1990 at the park's "Once-in-a-Blue-Moon" Candlelight Ski. Willow River's candlelight nights are so popular, says Kubler, "they've become the 'must-do' events of the season."

"Candlelight skiing is just an all-around good time," says Mirror Lake's Trumm. "People like to come back the next morning in the daylight to see where they were."

Paul Sandgren, superintendent of the Lapham Peak Unit of the Kettle Moraine State Forest, wanted to better serve skiers from the Milwaukee metropolitan area by expanding skiing hours on forest trails. But he didn't look forward to scraping candlewax off his mukluks night after night.

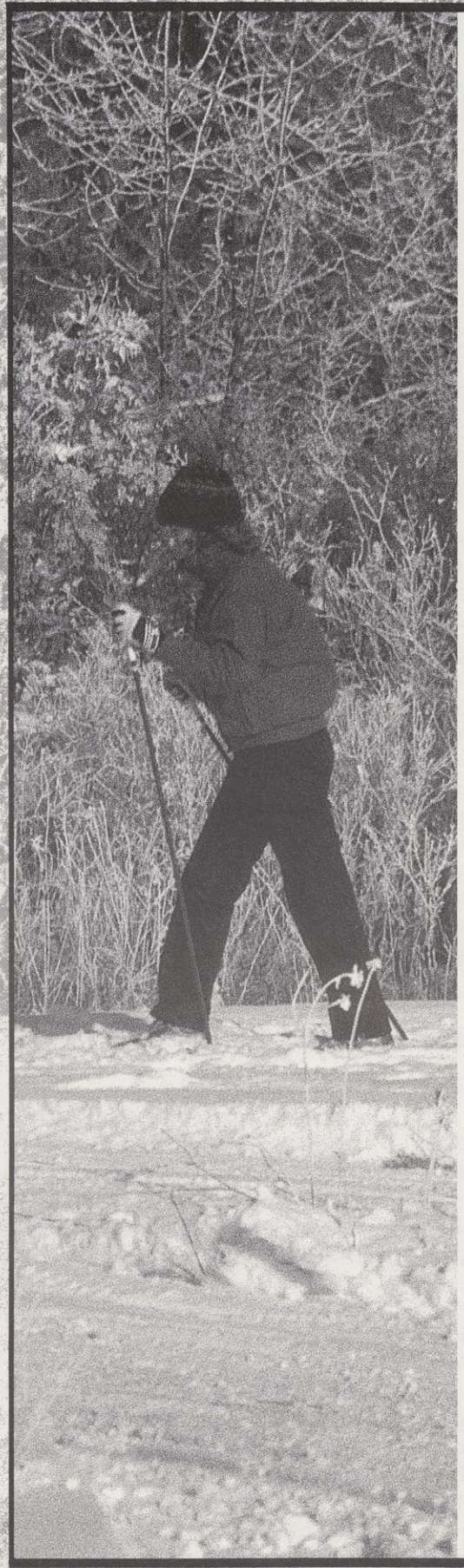
Besides offering a few special evenings of candlelight skiing, Lapham Peak now has lighted skiing: 2.5 miles of trail permanently lit with overhead incandescent spotlights spaced every 200 feet.

"The Friends of Lapham Peak really took the initiative on this," says Sandgren. "They got donations, held a run and raised about $15,000 for the lights." A local contractor donated the labor and machinery. The trail was incandescently illuminated for the first time on January 6, 1990.

This season the lights will be turned on as soon as there's skiable snow. The lit trail stays open until 10 p.m. Monday through Saturday and remains open until conditions dictate it be closed.

But the smell of smoldering wax is hard to forget. Sandgren has scheduled candlelight nights for Saturday, January 19 and Saturday, February 16 at Lapham Peak.

Maureen Mecozzi is associate editor of Wisconsin Natural Resources.



SCHUSSING BY STARLIGHT

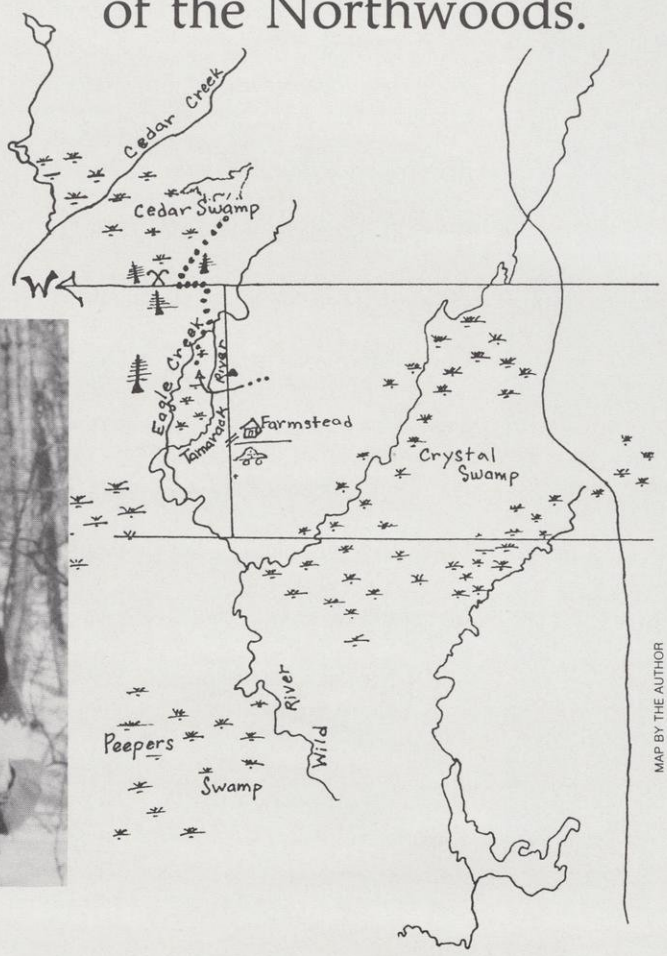
With the exception of the Willow River State Park open house on February 1, you'll need a Wisconsin State Park sticker or daily tag for admission to a park's candlelight ski. Call the park either the day before or the day of the event to check on snow conditions. Local chambers of commerce or the Wisconsin Division of Tourism, 1-800-372-2737, can direct you to accommodations and ski equipment rental.

State Park, nearest town	*Dates*	*Park phone*
Blue Mound, *Blue Mounds*	Jan.5, Jan.26, Feb.9	(608) 437-5711
Bong Rec. Area, *Kansasville*	Feb. 2	(414) 878-5600
Buckhorn, *Necedah*	Jan.12, Feb. 9	(608) 565-2789
Council Grounds, *Merrill*	Dec. 26, Jan. 26, Mar. 1	(715) 536-4502
Devil's Lake, *Baraboo*	Jan. 26	(608) 356-8301
Harrington Beach, *Belgium*	Jan. 12, Jan. 26, Feb. 9	(414) 285-3015
Hartman Creek, *Waupaca*	Jan. 19, Feb. 2	(715) 258-2372
Interstate, *St. Croix Falls*	Feb. 2, Feb. 16	(715) 483-3747
Kettle Moraine State Forest, Northern Unit, *Campbellsport*	Feb. 2	(414) 626-2116
Kettle Moraine State Forest, Lapham Peak, *Delafield*	Jan. 19, Feb. 16	(414) 646-3025
Kohler Andrae, *Sheboygan*	Feb. 2	(414) 452-3457
Lake Kegonsa, *Stoughton*	Jan. 12, Jan. 20, Feb. 2	(608) 873-9695
Lake Wissota, *Chippewa Falls*	Jan. 5, Jan. 26, Feb. 23	(715) 382-4574
Mirror Lake, *Lake Delton*	Jan. 5, Jan. 19, Feb. 2	(608) 254-2333
Newport, *Ellison Bay*	Jan. 19	(414) 854-2500
Northern Highland American Legion State Forest, *Woodruff*	Jan. 26	(715) 385-2727
Perrot, *Trempealeau*	Jan. 12, Jan. 26, Feb. 9	(608) 534-6409
Willow River, *Hudson*	Jan. 1, Feb. 1	(715) 386-5931

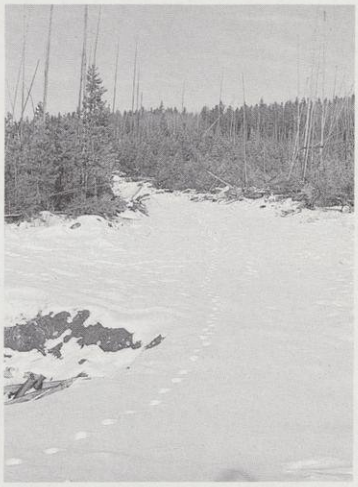
LONE WOLF ODYSSEY

Bundle up for a winter trek to seek the spirit of the Northwoods.

Author Karen Vermillion



MAP BY THE AUTHOR



ROBERT WELCH

Could it be a wolf? Many members of the dog family walk in a straight line. This was a coyote trail.

Karen Vermillion

Cobalt darkness seeped into a scarlet sash of twilight on a black horizon. A deep blanket of bitter cold settled over the sleeping earth: still and silent except for the sounds of nature bracing against the plummeting cold. Sharp retorts from expanding lake ice sounded like moose wailing laments. Brittle branches crackled. The night was so quiet my ears rang in an aching search for any sound. I held my crystallizing breath momentarily to dampen that loud noise as I strained to listen to the silence. Nothing. No wolves tonight. Nature was saving its collective energy to endure and survive this frigid winter night.

The snow squeaked under my boots as I made my way to the cabin and the solace of radiating warmth from a crackling wood stove. My face glowed as the scented wood heat penetrated the chill and brought a sense of security and well-being.

There was work to be done, important details for tomorrow's adventure: make gorp, pack extra layers of clothing, gather maps and listen to a forecast. Last, I called my neighbors to let them know I was "going-in." If my car refused to start at the end of a long, sub-zero day, I knew they would come to my rescue.

Until the cold snap, the weather had been exceptionally warm for several days. Chinook winds, the snow eaters, bathed the Northwoods in an annual, blustery February thaw. Deep blankets of powdery snow had been transformed into crunchy, stiff layers of crystals. An icy hardpack sealed the snow's surface. For a few days the faint, rich scent of moisture had once again filled the air. Now swirling flakes drifted gently down amid the quiet pine boughs. Every drop of water was being squeezed out of the air again.

A radiant dawn broke the next day, frigid and fair. Light snow refracted sparkles of orange, red and

yellow from the morning sun, delicately dusting the topography that still lay in shades of indigo and violet.

Time passed quickly. As I drove slowly, the deep woods took on a vibrant clarity but the morning sun oozed little warmth into the -15° day. The plowed road ended miles from the nearest town adjacent to a farmstead. It continued only as a snowmobile trail.

I parked my car and grabbed my pack — gear inside and snowshoes secured on the outside. I fitted my feet with cross-country boots and skis and breathed deeply and slowly through my nose to acclimate to an environment so different from that in the toasty car. My nostrils rhythmically stuck together then released with each breath.

I stood silently anticipating the adventure that lay before me from this hilltop. I was starting a journey to fulfill a dream, to actually see a wild wolf! The ridgetop overlooked an expanse of tamarack, cedar and black spruce swamp. It was edged by wooded hills of birch, pine and maple. The vast expanse of trees, ice and earth spread invitingly before me, and it filled me with excitement.

Digging the poles in, I swished off heading into the woods. The trail led northward. Shafts of golden sunlight glistened on the pine needles and ran brightly over the snow. Pine boughs bobbed as a slight breeze knocked wisps of snow off the branches. Animal tracks meandered across my path. Trails made by deer, fox, coyote and others were deeply rutted in the crusted snow and showed clearly when highlighted by the thin dusting cover. Tiny mice tracks skittered lacelike over the surface, winding here and there, disappearing into the next stalk of grass and reappearing a short distance away. Bobcat tracks also padded past in an aloof pattern.

The exercise warmed me up as I glided down a slight grade, then up over gently rolling land and down again to a modest expanse where trees gave way to other vegetation that can survive having "wet feet." The small frozen pond was surrounded by tamarack and ringed with majestic cedar trees. Another set of tracks skirted the pond nearly due west, then turned to the north.

On closer look, I found a few clear tracks. They were dog-like. To positively identify the track I unpacked my ruler, measured the track from the base of the heel pad to the tip of the nail on the central toe, and also measured the widest point across the middle of the track from the inner to outer toes. I noted the tracks were roughly rectangular — longest from heel to central toe. Next, I measured the distance between repeated foot tracks. One can measure either heel-to-heel or nail-to-nail.

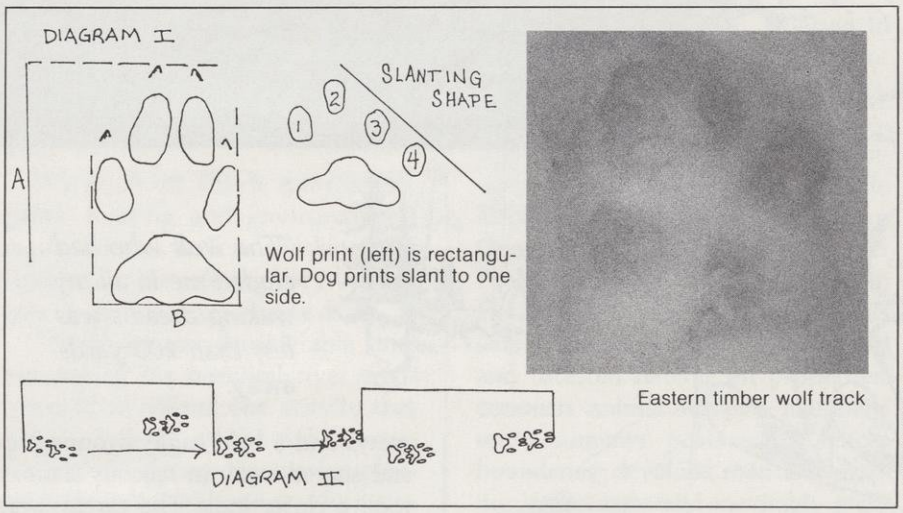
The tracks did not zigzag about, but proceeded in a straight line the way a wild canid would walk. Moreover, it looked like a second animal may have walked in the same tracks laying prints nearly on top of the first animal's.

A timber wolf! Given the track size and gait, I was relatively certain I was trailing a timber wolf or wolves. I knew that wolves wouldn't harm me, but I started getting excited and got butterflies in my stomach. These days, few people have been fortunate enough to set eyes on a wolf. They elude humans as a learned response from year upon year of persecution. When coupled with an acute sense of smell far exceeding that of humans, it's no wonder that wolves retreat long before we come close to them.

All the same, I was excited. I glided on, and a few meters down my trail I came across a healthy scat, almost black in color. A slightly bloody urination on the snow marked the territory, along with a nearby series of scratch marks. The scat was relatively fresh and I guessed the wolf had eaten within a day or so. I refrained from getting too close a look at the scat, tempting as it was to try to identify if she'd eaten a beaver, snowshoe hare, deer or something else. One has to exercise good judgement. Wolf scats contain eggs or ova of several hookworm and roundworm parasites that can lodge in human intestines if inhaled, swallowed or absorbed through skin.

Just ahead the snowmobile trail turned west into a road that's only passable in the summer. A second rush of excitement swept over me. In front of me, at the crest of a hillside covered with white and red pine, the wolf tracks shot out from the trees along the south edge of the trail. The tracks continued for a couple hundred meters, then veered off abruptly to the north again, running through another tamarack swamp riddled with black spruce and sedges. Jack pine, birch and maple thrived on the higher ground encircling the swamp.

It was beautiful, but I couldn't ski

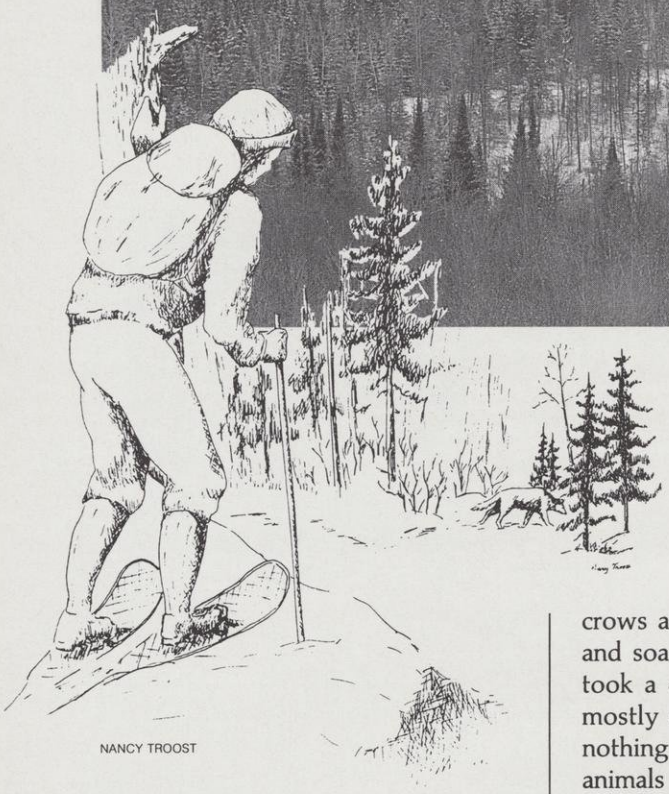


DIAGRAMS BY KAREN VERMILLION. WOLF TRACK PHOTO BY ROBERT WELCH

When identifying tracks pay attention to the shape of the print, the pattern of prints (called the track), the track width (called the straddle), the distance between prints (called the stride) as well as noting the terrain, food remnants, rubs and strands of fur near the track.

ROBERT WELCH

Northwoods wolf country.



NANCY TROOST

through it. Impatiently, I popped off the skis, dropped the pack from my back, unbound the snowshoes from the pack straps and traded skis and ski boots for snowshoes and snow pack boots. I hoisted the pack on my back, stashed the skis behind a fallen tree and set off at a steady pace through the swamp.

If the wolf had eaten within the last day or so I expected it to revisit the area to feed on any animal remains.

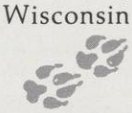
I headed north across the swamp. Around the base of a ridge lay a deer carcass slightly dusted with snow. As I drew closer to the carcass some crows and a bald eagle swooped up and soared away in raucous alarm. I took a closer look. The carcass was mostly eaten. Soon there would be nothing left save a few bones. Other animals would carry these away and gnaw them for calcium and other minerals. The few remains would feed bacteria, decompose and return scarce nutrients to the thin northern soils.

"The wolf who had eluded me in all my waking dreams was less than 200 yards away."

With bated breath, I climbed up the ridge that rose before me, stepping softly, slowly. A slight nor'westerly breeze gently bit the left side of my face. I looked around and realized I was losing track of time. Shadows had lengthened and the colors were subdued. Winter days are short.

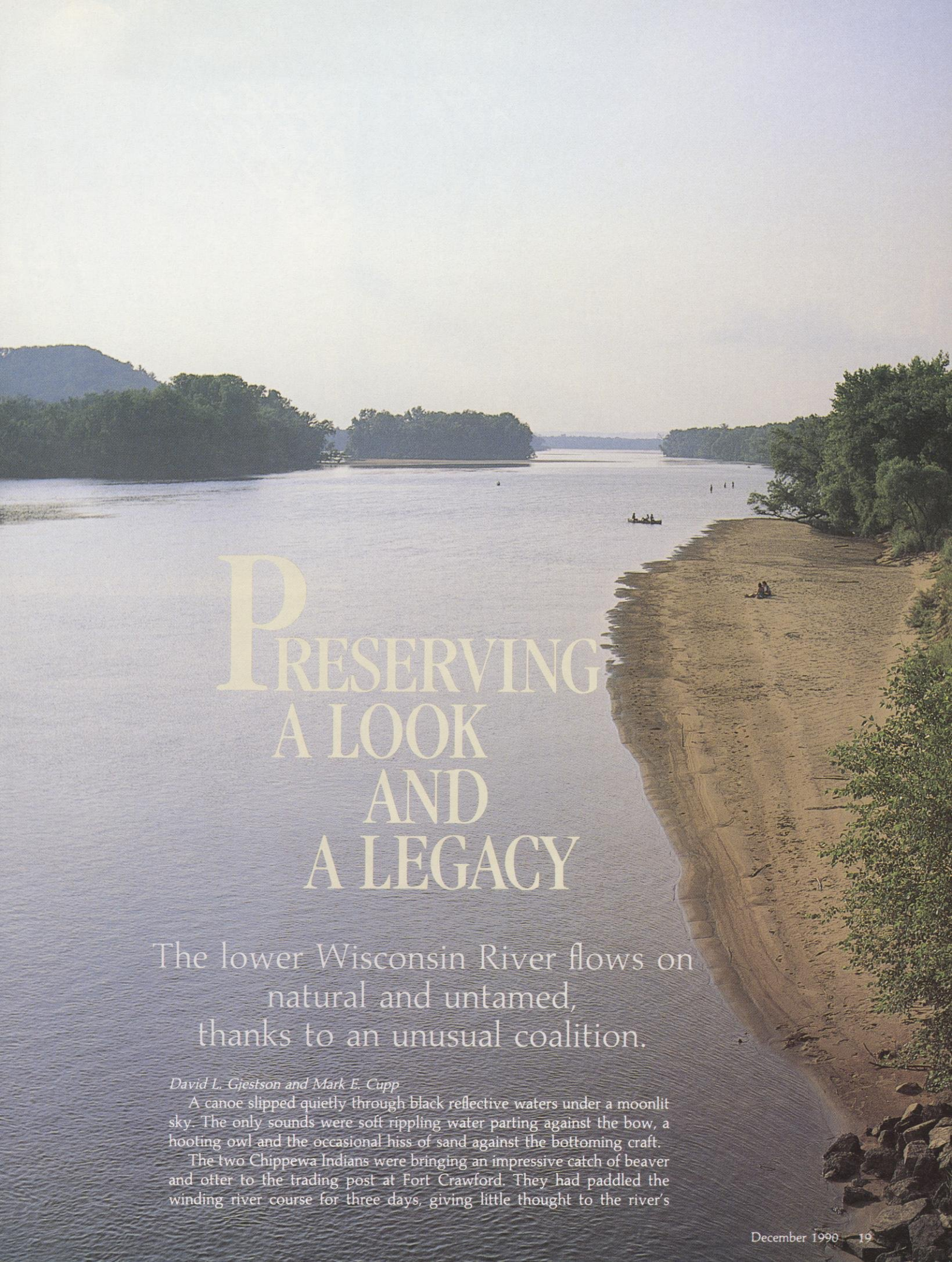
The crest of land where I stood was higher than the wetland that unfolded below and my eyes were naturally drawn to the horizon. There, upwind before me and unaware a lone wolf walked serenely.The wolf who had eluded me in all my waking dreams was less than 200 yards away.

Something intangible seeped deep inside of me. A sensation that must be akin to that instant when a photographer snaps a prize-winning shot, when an arrow hits the mark, when a 30-inch walleye is stalked and hooked or when a birder hears a spotted owl hoot . . . Now I know that the wolf is here; I saw her! Here, under the late afternoon sun my spirit soared to know that she, like me, was a living part of the northern Wisconsin woodlands.



Naturalist and educator Karen Vermillion monitors wolf populations in northwestern Wisconsin. She lives in Spooner.

ROBERT QUEEN



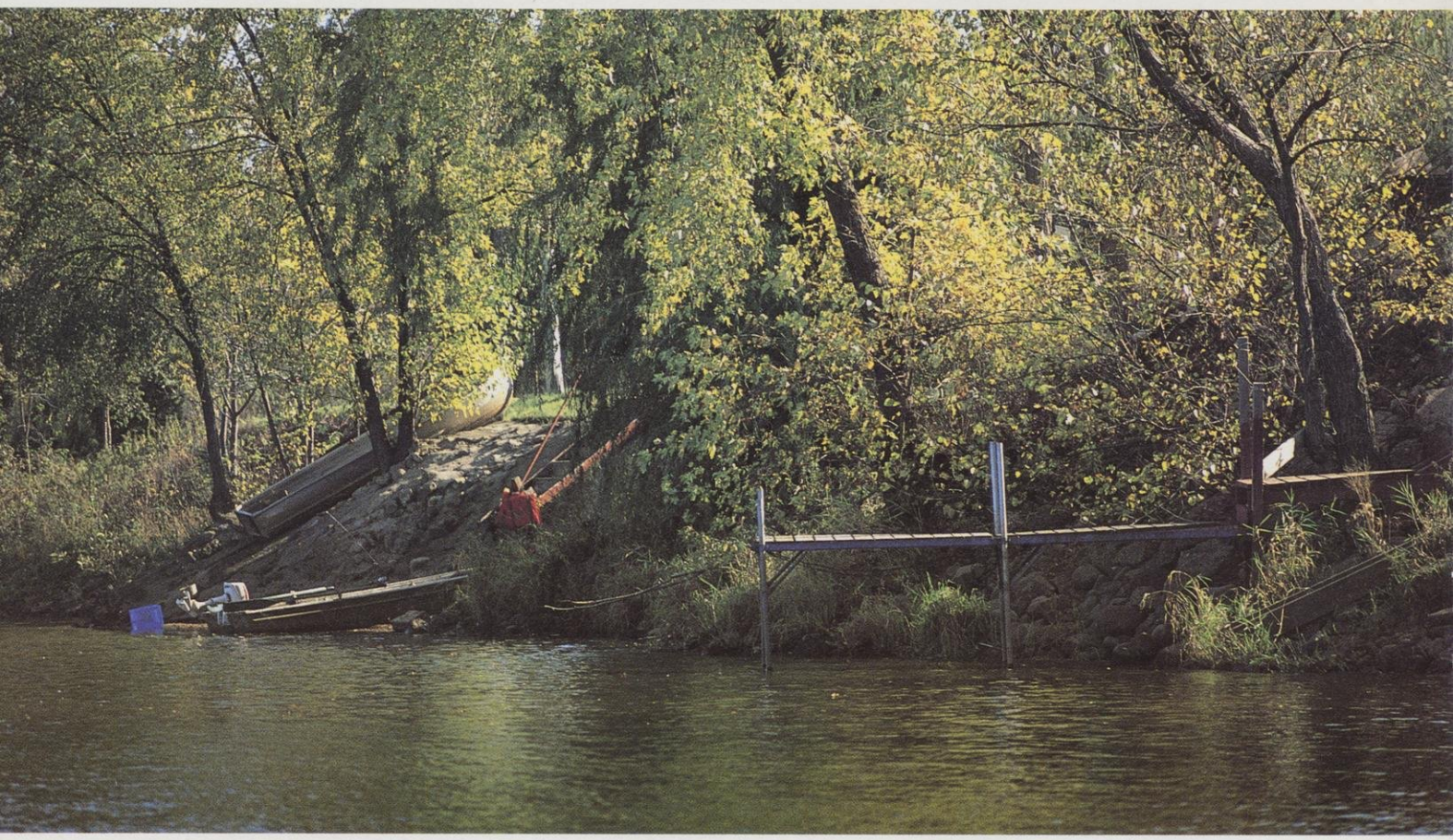
PRESERVING A LOOK AND A LEGACY

The lower Wisconsin River flows on natural and untamed, thanks to an unusual coalition.

David L. Gjestson and Mark E. Cupp

A canoe slipped quietly through black reflective waters under a moonlit sky. The only sounds were soft rippling water parting against the bow, a hooting owl and the occasional hiss of sand against the bottoming craft.

The two Chippewa Indians were bringing an impressive catch of beaver and otter to the trading post at Fort Crawford. They had paddled the winding river course for three days, giving little thought to the river's



(top) The lower Wisconsin's wild attributes are reflected in a management plan that considers those who live here and vacation here. Building projects must naturally blend into the landscape and remain inconspicuous to hikers and boaters along the riverway.

(bottom) The riverway law restricts shoreland development including stairways, walkways, boat launches and mooring sites. Wharfs must blend in with the shore and cannot jut into the water more than three feet from the shore. Even modest piers like the one on the right would not be permitted now.

changing channel or the nearby mist-shrouded bluffs. They called the river "Wees-Kon-Son:" the gathering-of-the-waters. The Chippewa, Winnebago, Sac and Fox commonly traveled the many streams and smaller rivers leading into this big water trail. This day the two braves felt good to return to its familiar route.

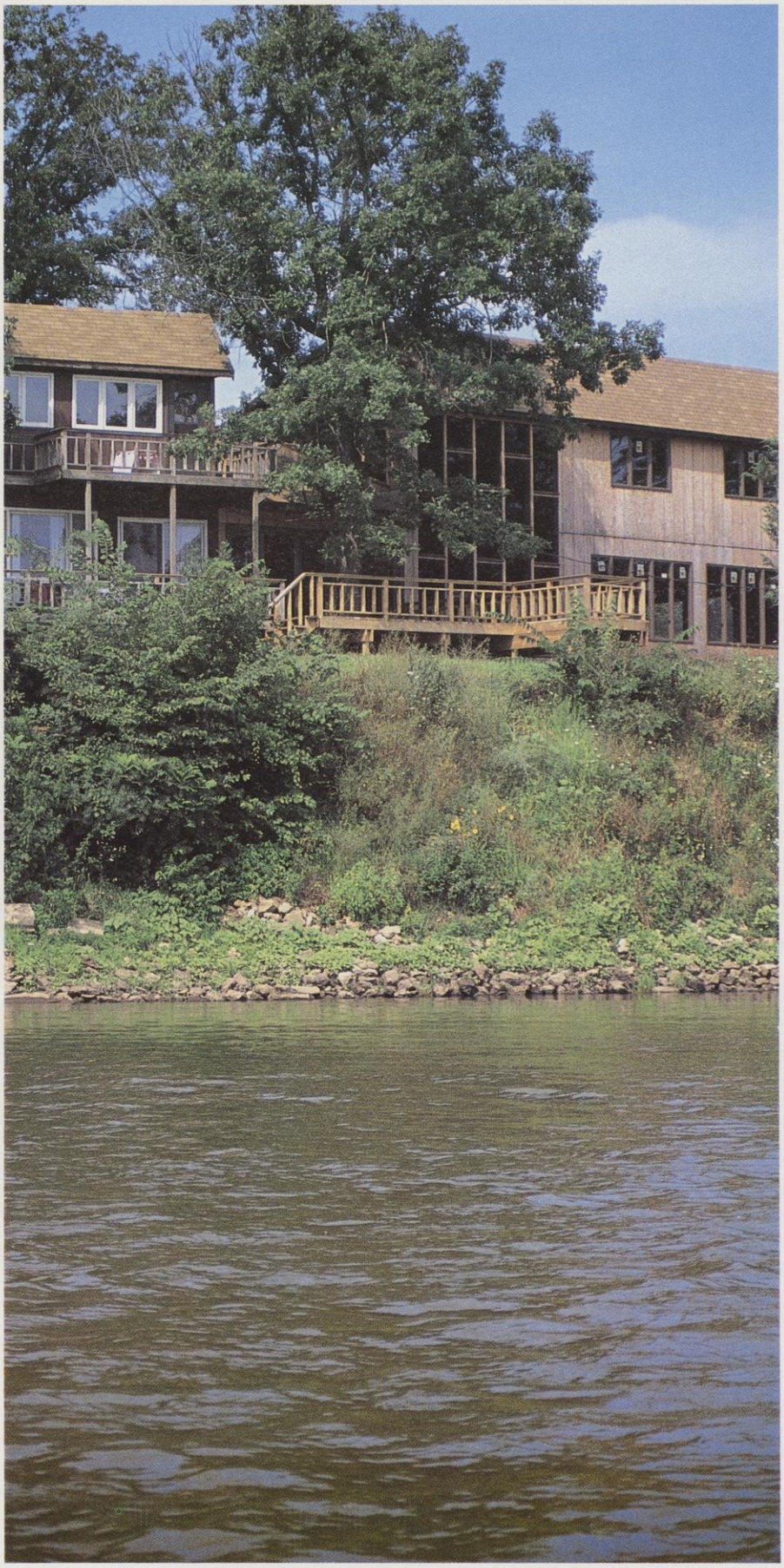
"Settler" history would largely forget their journey. White explorers like Pere Jacques Marquette (1673) would be credited with "discovering" this important trail connecting the Fox River from Green Bay to Fort Crawford on the Mississippi River.

The character of the Wisconsin River was molded 430 - 600 million years ago as thick layers of sandstone, limestone and dolomite were deposited throughout western Wisconsin.

A few hundred million years of erosion reduced the mountains to rolling hills, but the higher elevations in southwestern Wisconsin resisted four glacial assaults from the north and east. The glaciers ran out of steam, but not water. Gushing meltwater carried glacial sand and gravel into a natural valley to the west and eventually scoured out a v-shaped gorge 700 feet deep! Sand settled up to 300 feet deep in spots and formed the unstable bed for a river to meander through for a few thousand years.

About the river

Upstream from Prairie du Sac, the Wisconsin is called the "hardest working river in the nation" containing more hydroelectric dams (26) and storage reservoirs (21) than any other U. S. stretch. Its point of origin on the Michigan-Wisconsin border at Lac Vieux Desert flows southwesterly to its confluence with the Mississippi River — a distance of 430 miles. The river drains a watershed of 12,280 square miles (7,859,200 acres) or about one-quarter of the state. The



LOWER WISCONSIN STATE RIVERWAY BOARD

ROBERT QUEEN

Shoreland plantings and less reflective glass would better conceal these homes.

river is done "working" at the Prairie du Sac dam and runs free as the "lower" Wisconsin River for 92.3 miles to the Mississippi. This stretch is the longest free-flowing river in the Midwest.

In 1944, the Lower Wisconsin Wildlife Area was created with hunting, fishing and trapping revenue to provide a public place to enjoy these sports at a time when private lands were restricting those activities. By the 1970s, some 23,000 public acres had been acquired and another 7,000 acres were protected by various conservation easements.

A state riverway concept is born

A group of 35 citizens, local governmental officials and about 20 DNR staffers spent four years looking at the riverway, meeting, talking, analyzing, arguing and shaping a plan to manage the long, narrow 77,312-acre property for all citizens to use.

Everyone agreed that the river's scenic beauty — some 500 miles of undisturbed shoreland and 200 miles of bluff view, sand bars, wildlife and water — should be protected. The differences of opinion centered on how much of the shoreland should be developed for recreationists and how much should remain for traditional uses by farmers and valley citizens.

GENNY FANNUCCHI

Wildlife managers and technicians oversee the public shorelands that entice a wide variety of outdoor enthusiasts to tramp and float down the lower Wisconsin. (left to right) John Milliken and Doug Utter assist Wildlife technician Al Cornell.

Growing numbers of boaters, canoeists, birders, hikers and campers were drawn to this wild getaway near population centers in southern Wisconsin, northern Illinois and northeastern Iowa.

Shoreland development began to change the natural landscape. At the same time, the Wisconsin Department of Natural Resources sensed the need for a master plan to determine if the lower Wisconsin could accommodate increasing numbers of diverse recreationists while protecting natural resources.

The balance struck protects recreational and historic sites, but limits some of the formal campsite, boat launch, toilet and picnic areas proposed in original plans. Surprisingly, both riverbank residents and recreational users wanted to maintain more of the natural, scenic landscape at the expense of developing even a limited number of campsites, showers and tourist amenities.

Those managing the new state riverway are now working with riverside communities and visitors to provide an atmosphere for quality river trips and experiences. The trick is envisioning how and where a wide variety of recreation can be compatible. Second, how those who live along the river can build homes and earn a livelihood while maintaining the corridor's scenic landscape and natural resources.

Those looking for a recreational home on the river include canoeists, float trip tubers, anglers, water skiers, swimmers, sunbathers, campers, hikers, hunters, historians, picnickers, horseback riders, dog trainers, trappers, snowmobilers, cross-country skiers, birders, nature studiers and auto tourists. Obviously, the riverway can't accommodate all these uses in the same place without creating conflicts.

Surveys of river recreation showed uses could be designated by zone. Sixty eight percent of the water recreation takes place between Prairie du Sac and Spring Green. Sixty percent of the users rent canoes and plan trips with the 10 canoe livery services on this same stretch of the river.

Hunting, bird watching, nature study, bank fishing and wildlife education will likely center on eight existing wildlife areas, 18 Natural Areas and a DNR visitor/education center at Tower Hill State Park.

A system of foot, bike, horse, ski and snowmobile trails will be developed on portions of the river corridor including a proposed eight-mile hiking trail from the Millville Unit to Wyalusing State Park.

Formal campgrounds will only be developed for canoeists at the Gotham Sands area and a primitive campsite for backpackers in the Millville Unit between Woodman and Wyalusing. Campers seeking more amenities can be accommodated a short distance from the lower Wisconsin River at a host of county and private campgrounds as well as Blue Mound, Governor Dodge, Tower Hill and Wyalusing state parks.

Portable toilets are located only at


MARY BETH PECHINEY


ROBERT QUEEN

LOWER WISCONSIN STATE RIVERWAY BOARD

Three with their eyes on the river: Conservation Warden Scott Thiede warns a canoeist about littering; DNR Riverway Coordinator Dave Gjestson; Riverway Board Executive Director Mark Cupp addresses a crowd at board headquarters in Muscoda.

the popular DNR launch site in Arena and at Peck's Landing near Spring Green. More locations will be added.

Lands and easements to turn these blueprints into recreational reality will be procured with the state's new Stewardship Fund making good use of $2 million in each of the next 10 years. The nine-person Riverway Board will maintain the riverland corridor's natural look by assuring development and renovation projects meet new performance standards.

The DNR team overseeing riverway projects include a riverway coordinator, a full-time conservation warden, and six wildlife management staff. Other DNR staff working in adjoining counties — including land agents, fisheries managers, foresters, wardens, park superintendents and a water regulations/zoning specialist — assist in riverway projects in addition to their normal duties. Anticipating that part-time help won't be available to provide reliable workers, the river management plan identified the need for additional staff. Until the budget process provides this relief, tasks involving planning, education, habitat management, enforcement, land posting, litter pickup, fencing, surveys and general property maintenance must be done with existing personnel.

As riverway coordinator, Dave Gjestson serves as liaison with the riverway board and works to implement the property master plan with assistance from other current DNR staff.

Warden Scott Thiede enforces fish, game, boating and environmental regulations, as well as checking that landowners are meeting the riverway board's performance standards.

Thiede spends considerable time monitoring the beautiful river environment to control one activity that many members of the public commented on during the master planning process — littering! To maintain the river corridor's wild look without maintaining trash containers that tend to attract household refuse, the law establishing the riverway laid out some hard and fast rules: All boat operators must have a large enough waterproof container on board to carry out all garbage generated. No one may have *any* glass container on DNR lands, on islands or public waters in the riverway. All trash must be removed from the public lands and waters.

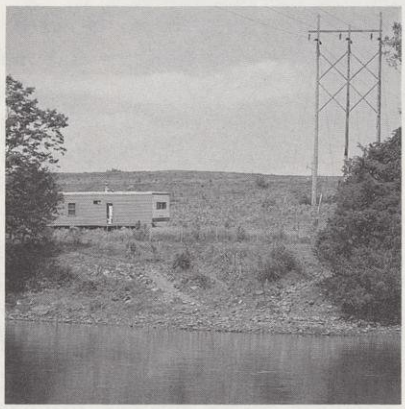
Wildlife management field staff bears the lion's share of the freight for managing public property on the Lower Wisconsin River. Area Wildlife Manager Doris Rusch and Wildlife Technician Dennis Gengler handle the Dane County portion; Area Wildlife Manager Tom Howard in Dodgeville supervises the staff managing river properties in Sauk, Iowa, Richland, Crawford and Grant counties. His staff includes Wildlife Manager Genny Fannucchi and Wildlife Technician Al Cornell at Spring Green as well as Wildlife Manager Paul Brandt and Wildlife Technician Fletcher Flansburg in Boscobel. This staff manages a variety of wetland and forested habitat on properties, conducts animal surveys, maintains impoundments, posts signs, fences boundaries, develops road and parking lot accesses and inevitably picks up litter from visitors. Their chores are often unseen but, over time, they won't be unrecognized.

Perhaps one day 100 years from now, two canoeists will again travel down the Lower Wisconsin State Riverway's undeveloped shores. They'll feel good about what they see and enjoy the beauty of the protected valley. And they too will carry good messages to their tribe about memories, about natural beauty and about life along this peaceful river.

David L. Gjestson is DNR's Lower Wisconsin State Riverway coordinator. Mark E. Cupp is executive director of the Lower Wisconsin State Riverway Board.

Shoreland partners: the Lower Wisconsin State Riverway Board

When one considers the lower Wisconsin River valley is within a 4½- hour drive of over 15 million people, it is amazing that the pristine quality and scenic beauty of the valley remains relatively unaltered by human hands. Fluctuating water levels and exorbitant costs to build on the towering bluffs coupled with the excellent stewardship demonstrated by past and present landowners have resulted in a river valley befittingly termed one of the state's scenic wonders.

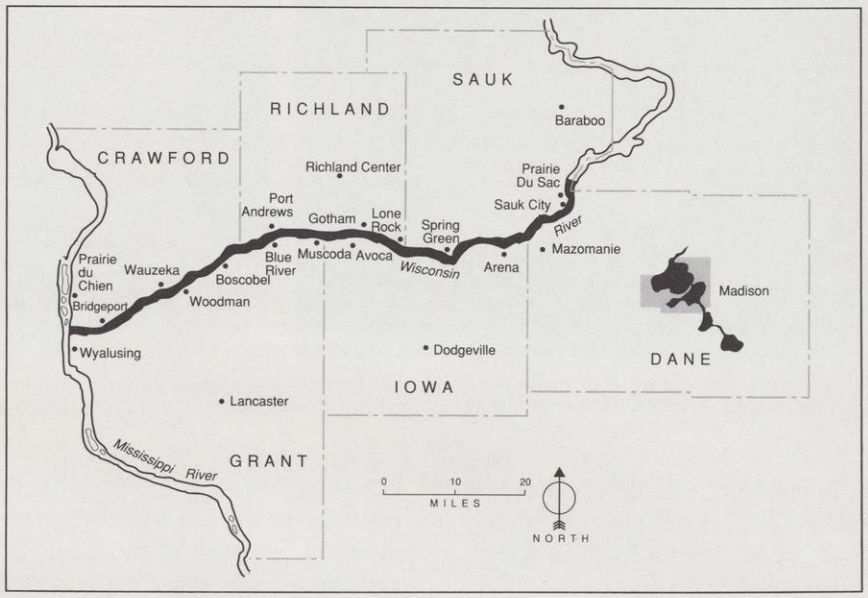


ROBERT QUEEN

Abandoned trailers and erosion-washed gullys mar the shoreline.

With development pressures increasing and the opportunity to preserve the valley's "look" closing, passage of 1989 Wisconsin Act 31 added a new chapter to the valley history. The Lower Wisconsin State Riverway and the Riverway Board, a new independent state agency, were created to protect the valley's beauty and natural character. The riverway concept resulted from a compromise forged by Governor Thompson, six valley legislators (Sens. Kruel and Rude; Reps. Tregoning, Schultz, Johnsrud and Brandemuehl) and Rep. Black from Madison.

Retaining local control was a key element of the compromise and is reflected in the Riverway Board's composition. Six of the nine board members are local elected officials or residents of a municipality bordering the river. Three "at-large" members represent recreational user groups and must be from outside the valley. All members are appointed by the governor.



JEANNE GOMOLL

The Lower Wisconsin State Riverway Plan maps out recreation and land management along a largely undeveloped waterway that traverses six counties and at least 15 communities. The riverway is a popular weekend getaway for an estimated 15 million people in Wisconsin, Iowa, Illinois and Michigan.

The board administers a system of performance standards to preserve the aesthetic quality of the valley without prohibiting development. The board also reviews permit applications for structures, walkways, stairways, utility facilities, certain roads and bridges as well as reviewing permit applications for timber harvesting within the entire 92.3 mile corridor. The DNR's riverway coordinator assists by screening permits and providing administrative support for the board.

Persons wishing to build or modify a structure — a house, garage, shed, mobile home or the like — must meet the "visually inconspicuous" standard. This is achieved through growing or maintaining vegetation that screens the structure from the river, by restricting structure height, by requiring exterior colors which harmonize with surroundings and by limiting use of glass. In addition, building sites on bluff lands must have a slope of less than 12 percent and must be located at least 100 feet below or behind the bluff top. On lands not visible from the river, the sole restriction is on the structure's height. Repairs to

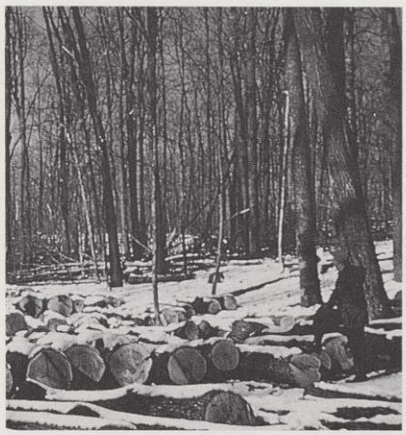
LOWER WISCONSIN STATE RIVERWAY BOARD

Eyesores like this dilapidated, abandoned house built in the river floodplain prompted a plan to protect the river's scenic beauty.

damaged structures are allowed without a permit as long as the structure will not be larger or more visible from the river than the original building and municipal ordinances don't prevent the repairs.

Walkways and stairways providing access to the river must be visually inconspicuous and safeguard against erosion.

The most complicated performance standards govern timber harvesting. To preserve the aesthetic integrity of the valley, lands adjacent to the river and the bluffs are the most stringently regulated. In the River Edge Zone, only trees which pose a safety hazard may be removed. Limited timber harvesting is allowed in the Bluff Zone in the fall

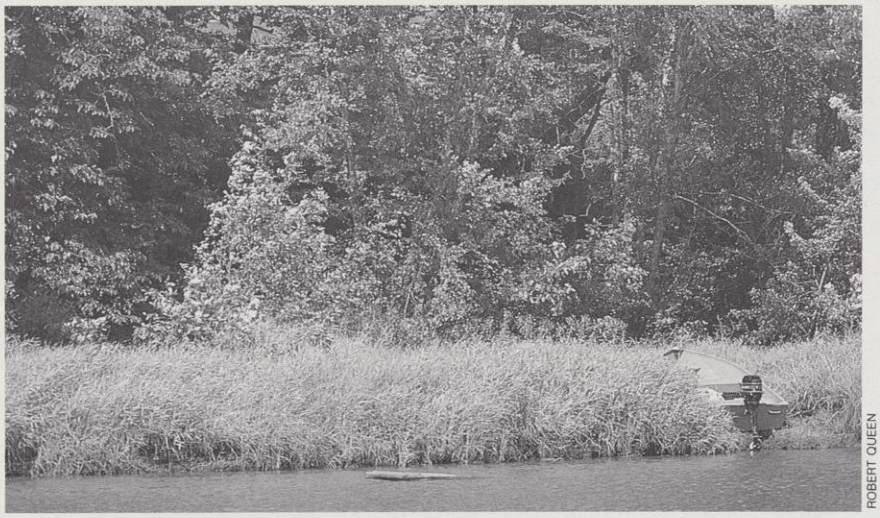


LOWER WISCONSIN STATE RIVERWAY BOARD

Managed timber harvests can maintain a solid canopy without disturbing the shoreline vistas.

and winter although clear cutting of the bluff tops is not permitted. In the Riverview Zone (the hillsides visible from the river) small clear cuts, shelterwood cuts and selective cutting is allowed. In the Resource Management Zone (those near shore lands not visible from the river) a general permit is required which allows the landowner to harvest trees without restrictions. Nevertheless, the board encourages that timber management plans be developed for all lands within the riverway.

The board may place conditions on permits to insure compliance with the riverway law. The enforcement arm of the board is the DNR riverway conservation warden.



ROBERT QUEEN

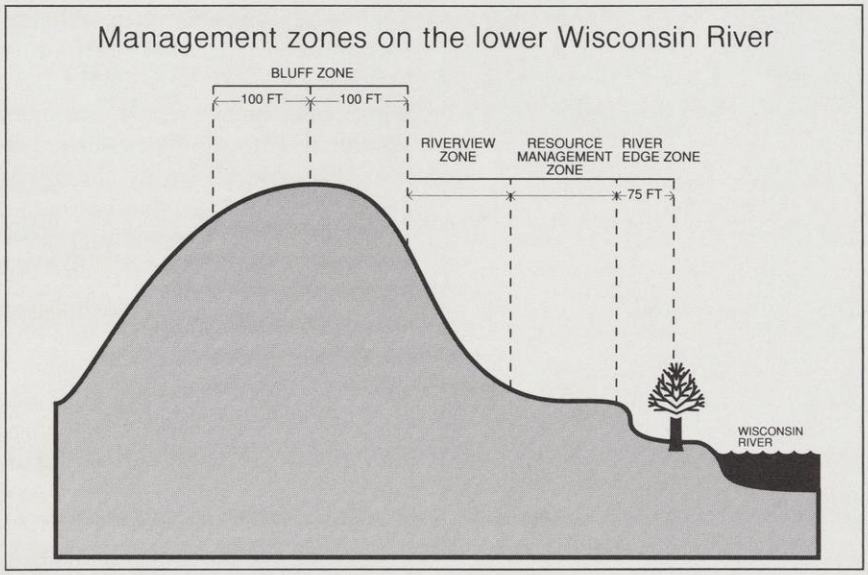
Even those floating by would scarcely see the house shielded by these trees. When leaves and tourism drop off in the fall, homeowners enjoy six months of a panoramic river view. Spring leaves will restore this resident's privacy from riverway tourists.

Fines of up to $1000/day can be levied against persons who knowingly violate the law. The board may also revoke a permit if the law is not adhered to. Cooperation from local residents and landowners has been excellent and, so far, no fines have been issued.

The riverway law prohibits other activities on riverfront property. No new piers are allowed although wharfs parallel to the shoreline are permitted. No boat shelters or swimming rafts may be built. Disposal of junk and solid waste on lands within the riverway is also prohibited. Woody vegetation must be left intact unless specifically exempted by law.

Regulating land-use activities through a system of performance standards is a unique concept. A successful riverway plan lies in the board's ability to maintain the fragile and delicate balance between protecting and preserving aesthetic qualities in the valley, and protecting and preserving the rights of landowners and local residents. Through scrupulous administration of the law, the plan will succeed, and the treasure known as the lower Wisconsin River valley will be preserved to be enjoyed by generations yet unborn.

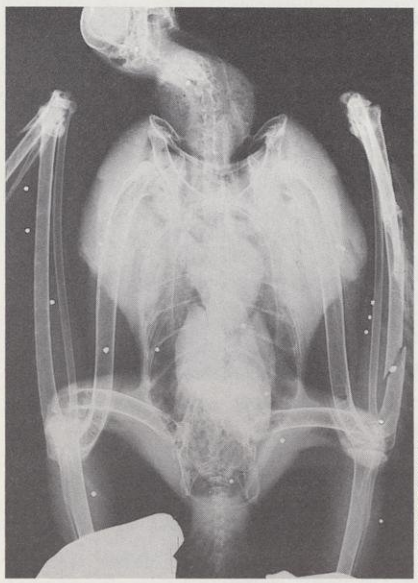
— *Mark E. Cupp.*



THE RAPTOR CENTER

A SECOND CHANCE

This Minnesota hospital for birds of prey gets a lot of customers from Wisconsin air space.



THE RAPTOR CENTER

An X-ray reveals at least 15 lead pellets peppered this injured eagle.

Charlene M. Gieck

Segundo, a bald eagle, not only got a second chance at life, but a third chance, yet he's hardly led a charmed life.

Segundo hatched on the Wisconsin River just south of Rhinelander in the spring of 1983. On June 1, 1983, he was banded with an aluminum U.S. Fish and Wildlife Service (USFWS) leg band by DNR staffers Chuck Sindelar and Ron Eckstein. This band would identify the eagle for life. His second chance came on October 3, 1985 when he was retrieved near Houghton, Mich. Shotgun injuries broke the ulna (a bone in his right wing) and subsequently damaged skin on his left foot. Tests showed elevated lead levels in his blood. His broken bone was set, the foot healed and he was released three weeks later on October 22 at the Carpenter Nature Center near Hastings, Minn.

Segundo's second chance was possible thanks to The Raptor Center, a wild bird rehabilitation center associated with the University of Minnesota in St. Paul. Without medical attention, this endangered bird would not have survived in the wild.

How do we know the care helped? Well, Segundo was brought back to The Raptor Center last March 31. He'd been shot again! This time his left wing was extensively damaged, but there was no trace of lead in his bloodstream, and his foot and right wing injuries had totally healed. Three pieces of shot were still imbedded in his right wing.

The Raptor Center gives injured birds of prey a second chance. That care is crucial for species like bald eagles whose populations are low enough that each individual is important to maintaining the numbers of birds.

Raptors, from the Latin *rapere* meaning to grip or grasp, include the eagles, hawks, falcons and owls who hunt by grabbing their prey with strong feet. Given good health, raptors have long life spans: 10-15 years for small species and 25-50 years for larger species.

The Raptor Center was founded in 1972 out of a love for these regal birds. Dr. Patrick Redig, a veterinarian and falconer, and Dr. Gary Duke, a physiologist and avid birder, emphasized providing individual care to birds whose survival was critical to

the survival of their species. Center staff have treated more than 5,500 raptors since then. Most birds treated here come from the Midwest, but 37 states send patients here, recognizing the excellent care they receive. Bald eagles have received special attention because they are large birds that fascinate the general public both as our national symbol and a species we especially want to protect. Between 1975 and 1989, 639 eagles were admitted for care. Almost half (249) came from Wisconsin.

Major causes of bald eagle injuries have not changed over the years. The top problem is trauma caused by collisions with cars, powerlines or nestlings falling out of trees. Shooting, leg-hold traps and disease follow as major threats. A growing number have been poisoned by lead or other toxicants. A few birds got tangled up in fishing line or other miscellaneous injuries.

The midwestern eagle population is large and many injured birds are found annually by private citizens cooperating with the USFWS, and state departments of natural resources.

THE RAPTOR CENTER

Mark Martell and Robert Binger prepare to release the recovered Segundo.

Quality medical treatment

The center is set up like a hospital. There is a treatment room, surgery room, labs for tests, an X-ray facility and rooms for "patients."

I spent four days at The Raptor Center in March 1990 assisting with bird care.

Each morning started with "rounds." Charts were reviewed and all the patients were examined to determine their needs for the day. The more critical patients received treatment first. I dressed two eagles' wings with clean bandages. The birds were anesthetized; fully-awake eagles would have been a handful. I noticed many of the supplies had been donated by 3M Corporation, a nearby firm that takes an active interest in developing medical supplies that may be used on wild birds.

These same eagles received royal foot baths. Yes, I got to scrub their feet. It sounds funny, but it's very important. A raptor's feet are its means for catching dinner, so proper care is vital. Even slight foot injuries can grow into major problems.

During my stay, several eagles were admitted, three from Wisconsin. Spring bird migrations bring increased admissions. Fall migration is an even busier time: birds are on the move, shooting mishaps happen, more lead poisoning cases are discovered and more people are in the woods so injured birds are more likely to be found.

One eagle I saw had lead poisoning and another was poisoned from ingesting organo-phosphate pesticides. Both cases were treated very effectively with drugs, so the prognosis was good.

Other cases require orthopedic surgery to reset broken wings or repair internal injuries often caused by collisions.

Treatment is only the first step. Birds need a convalescence starting with cage rest followed by physical therapy. Birds are later taken to flight areas for daily exercise. Recovery can take from three to six months; up to a year in rare cases.

Not just birds of prey

On the day I met Lily, a trumpeter swan, she was having a feeding tube removed. The procedure required some stitches. Dr. Laurie Degernes donned sterile gloves to keep the surgical equipment and needles sterile.

You might think it odd to find a trumpeter swan at a raptor center, but staff quickly developed the expertise, equipment and procedures to save trumpeter swans when lead poisoning was discovered in these majestic birds reintroduced in Minnesota and Wisconsin.

"We treat birds for lead poisoning with advanced medical equipment [originally] developed to treat human colon cancer," explains Dr. Redig, center director.

Treatment involves flushing shot from the bird's gizzard, then threading an endoscope — a long, thin fiber-optic instrument — down the bird's throat and esophagus into the stomach.

The endoscope is connected to a video monitor through which Dr. Degernes can locate tiny lead particles. She then removes the particles one by one with a miniature tweezers-type instrument attached to the endoscope. Following the procedure the swans are treated with medication for up to six weeks to slowly remove lead residues from their blood and tissues.

Twenty-two trumpeter swans from Wisconsin received first aid at The Raptor Center in 1989 and another 22 in 1990. Of the 1989 swans, 18 (82 percent) were returned to release projects. This year, 10 have returned to release projects and six cases are still pending.

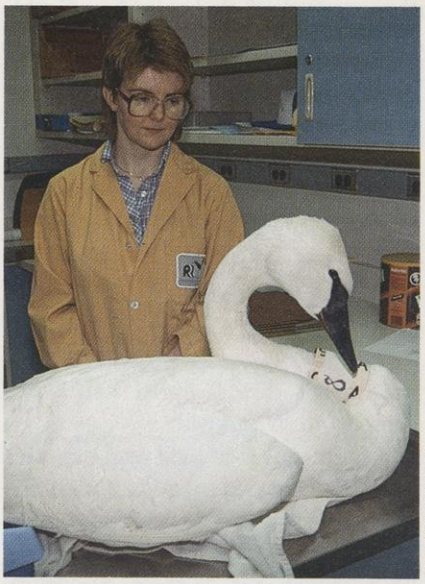
What happened to Lily? Well, she had a broken mandible (lower bill). Unfortunately it couldn't be repaired, would not regrow and had to be removed. The feeding tube was removed to see if she could eat on her own. She survived and has been placed at a game farm as part of a captive flock.

The roots of Wisconsin's peregrine program

Our program to reintroduce peregrine falcons in Wisconsin started with Dr. Redig and his associate, Dr. Harrison Tordoff from the Bell Museum. In 1982, Redig and Tordoff started reintroducing the extirpated peregrine in Minnesota. In 1986, four of the Minnesota-released birds nested on the Wisconsin side of the Mississippi River.

THE RAPTOR CENTER

Dr. Martin Freeman and Dr. Laurie Degernes snake an endoscope down a trumpeter swan's throat to retrieve lead pellets from its gizzard. This endoscopic equipment, designed to treat human colon cancer, was quickly adapted to treat lead-poisoned swans.



THE RAPTOR CENTER

Dr. Deb Ekstrom examines a swan that will convalesce for up to six weeks as ingested lead slowly purges from its bloodstream and tissues.

Peregrines defend territorial rights for up to 10 miles around their nests. Once the pair established across the river in Wisconsin, the nearby Minnesota release site was closed. We began searching for additional sites in the Badger State and have since released 50 peregrines here.

Redig and Tordoff continue to coordinate the Midwest peregrine effort, which now includes release sites in Minnesota, Wisconsin, Iowa, Illinois, and Michigan. Indiana, Nebraska and Ohio will join the program in the coming years.

Under The Raptor Center's guidance captive breeders supply the chicks that are banded, examined and then shipped to release sites. The center also provides advice and medical care for injured falcons.

In 1990, seven pairs returned to nest in Minnesota and one pair returned to a Milwaukee release site.

Raptor research moves on

Individual care is still the hallmark of the center's work. But center staff also are investigating factors that could threaten birds populations. Raptors are threatened by contaminated habitats, loss of wintering and

continued on page 33

WISCONSIN TRAVELER

DECEMBER 1990

INSIDE

Hard-water fishing

Let the games begin!

A hot (air) affair

Winter fireworks

VOLUME 2 NO. 6

WISCONSIN HISTORY

A certain type

A free press: guaranteed by the Constitution, but much harder to maintain without a simple invention created in the state of Wisconsin. The boxy contraption endured a century of refinements — most notably, the addition of electricity and the binary code — to become an indispensable tool for human communication.

The device was the brainchild of a Milwaukee man dedicated to printing and distributing ideas on paper. You can be sure White-Out will never obliterate his name from Wisconsin history.

The first one looked like a sewing machine and had only a single key ("W"). But Christopher Latham Sholes knew he was on the right track. Only a man with such a long and distinguished career in Wisconsin letters could appreciate the time-saving, idea-disseminating potential of the machine he would later call the "typewriter."

By trade Sholes was a printer. By inclination he was an advocate. Needing a soapbox from which to espouse his views on temperance, the abolition of slavery and other topics of the day, Sholes found employment at several newspapers across the state.

His name appeared on the masthead of the Green Bay Intelligencer, the Madison Inquirer and the Kenosha Southport Telegraph. He became publisher of Garland, a literary magazine; subscribers were warned that future issues would "contain useful reading matter instead of love-sick trash." He served as editor of the Milwaukee Sentinel between stints as postmaster of Kenosha and Milwaukee.

C. Latham Sholes, dignified practitioner of hunt-and-peck, and one of his early typing machines. State Historical Society

Throughout his career, Sholes tinkered with inventions to speed the publication of books and newspapers. While working on a device for page numbering, Sholes and two associates hit upon the idea of a machine that would print letters and words as well as figures.

It wasn't an original concept — inventors in Massachusetts and France had given the idea considerable thought. It took Sholes' persistence and the skill of Milwaukee clockmaker Matthias

Continued next page, col. 1

Lewis Koch/State Historical Museum

Making music

Music has been an important element in the daily life of many ethnic communities throughout Wisconsin's history. The **State Historical Museum** exhibit "In Tune with Tradition: Wisconsin Folk Musical Instruments" highlights the work of artisans who have captured the distinctive sounds of a people and place in wood and hide, metal and cloth.

Learn how Ojibwa dance drums, Croatian tamburitzas, Greek bouzoukis, Hmong flutes, Italian button accordions, Norwegian hardanger fiddles and Puerto Rican cuatros are made and played. "In Tune with Tradition" runs through January 13. The museum is located in Madison on the Capitol Square, 30 N. Carroll St. (608) 262-7700.

If the exhibit whets your whistle for folk music, stop in at Madison's **Wild Hog in the Woods Coffeehouse**, 306 N. Brooks St., where you'll be entertained by troubadours, minstrels, pickers and crooners of all styles. $1. Call (608) 233-9773 for a schedule.

Continued from previous page

Schwalbach to construct the crude prototype with a single key.

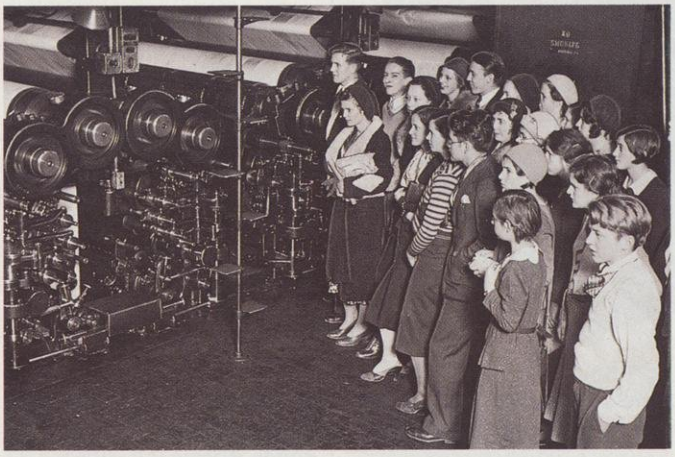
That was the summer of 1867. By winter, the first complete typewriter was built, with the letters (capitals only) arranged in alphabetical order. Sholes received a patent in 1868 and continued to refine his creation, developing more than 50 designs.

In 1872 Sholes sold his interest in the machine to a partner for $12,000. Others made millions mass-producing typewriters; Sholes died an impoverished man in 1890. He was buried in Milwaukee's Forest Home Cemetery, where a marble-and-bronze memorial marks his grave. An early Sholes typewriter is in storage at the **Milwaukee Public Museum**, and another Sholes model waits silently for a deadline that never comes in a back room at the **State Historical Society** in Madison. Sholes' home on the 1200 block of 55th Street in Kenosha is undergoing restoration.

The pen may be more powerful than the sword, but today's typewriters and word processors are a whole lot faster. See them in action at Wisconsin's largest newspapers, the **Milwaukee Journal** and the **Milwaukee Sentinel.**

Families can take special tours of the newspapers' plant at 333 W. State St. during the Christmas and New Year's holidays. The free tour lasts about an hour and 15 minutes — wear comfortable shoes and be prepared to do a lot of walking. You'll visit the newsroom, the production areas and the pressroom. (While you're there, give columnist Joel McNally a piece of your mind.)

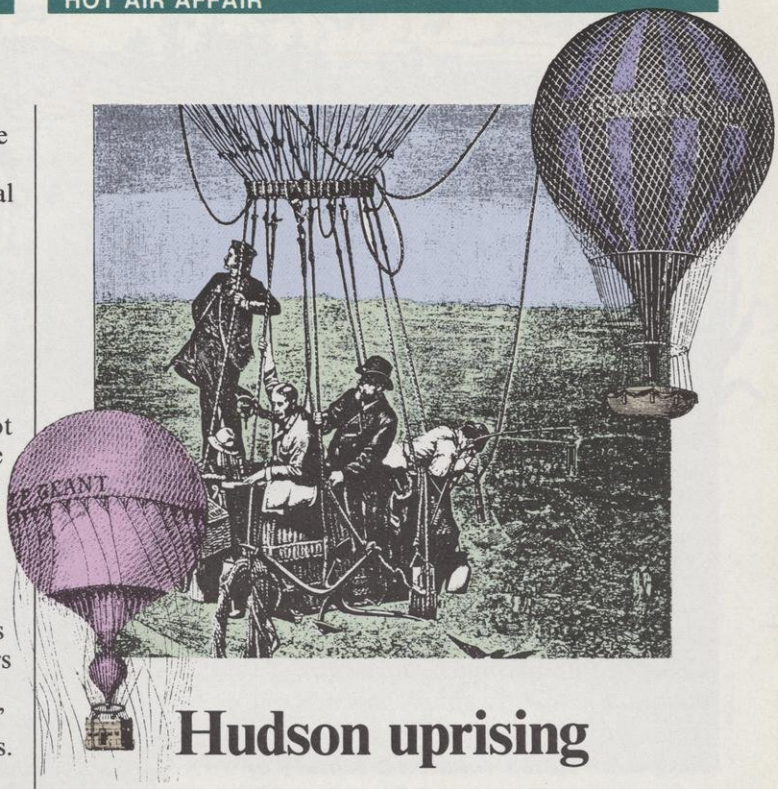
Many other newspapers around the state offer tours as well; check the phone book under "Newspapers" and call first for tour times.



Watching the latest news roll hot off the Milwaukee Journal presses thrilled these Oconomowoc High School students in 1931. Take a tour and see if the excitement's still there six decades later.

Milwaukee Journal/State Historical Society

Milwaukee Journal/ Milwaukee Sentinel Public Service Office, (414) 224-2208; Wisconsin Newspaper Association, (608) 238-7171; Milwaukee Public Museum, 800 W. Wells St., (414) 278-2700; Greater Milwaukee Convention & Visitors Bureau, 1-800-231-0903; Kenosha Area Tourism, (414) 658-4FUN; Greater Madison Convention & Visitors Bureau, (608) 255-0701; State Historical Society, 816 State St., (608) 262-8060. For statewide information on museums, call 1-800-372-2737.



Hudson uprising

Residents of **Hudson** know there's nothing like a little hot air to take the chill off winter. On February 1, 2 & 3 the city will host the second annual **Hot Air Affair**, a weekend of outdoor recreation that's ballooned into one of Wisconsin's most enjoyable events.

Start your affair in Hudson with candlelight skiing on Friday night at Willow River State Park. Early Saturday morning, 40 hot-air balloons lift off from E.P. Rock School and chase each other across the sky in a chicken-and-fox race. Reserve Saturday afternoon for snow golf and volleyball at the Hudson Country Club, then return to the school in the evening for the Moon Glow, where you can ride in tethered balloons and meet the pilots. A second balloon race will be held Sunday morning.

Since balloons are subject to the whims of weather, call ahead to confirm race times.

Contact the Hudson Chamber of Commerce, (715) 386-8411.

Winter sports spectacle

If you just can't wait for 1992, head for **Wausau** on February 1, 2 & 3 for the third annual **Badger State Winter Games**, Wisconsin's version of the Winter Olympiad.

Hundreds of amateur athletes of all ages and skill levels compete in downhill and cross-country skiing, curling, figure skating, hockey, speedskating and snowshoeing events. You may even get a glimpse of some past and future Olympians in action. All events are free for the watching. (Take the money you save and treat the gang to a real Wisconsin fish fry.) If you'd like to participate in the games, there's an entry fee for each sport. Contact the Badger State Games, (608) 251-3333 for schedules and other information.

Have an ice day!

... and then there's the one about the Wisconsin anglers so devoted to ice fishing they had an auger ready when hell froze over.

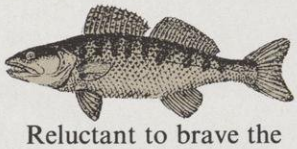
Give the sport a try and you may get hooked on ice fishing as well!

Winter angling offers all the advantages of summer fishing — without the mosquitos. To help you get started, the University of Wisconsin Sea Grant Institute offers *Ice Fishing*, a 20-page illustrated booklet highlighting the basic information new ice anglers need. You'll learn how to dress properly for the weather, find out about necessary fishing gear and unnecessary (but fun) gadgets, get a summary of

Hard-water fishing. David L. Sperling

Wisconsin ice fishing regulations and good advice on catching walleye, northern pike, yellow perch and bluegills through the ice. And while you're at it, request a copy of "Danger! Thin Ice!" — a fact sheet with 10 safety tips for going out on ice-covered lakes and streams. You'll receive both publications if you send $1 to UW Sea Grant Communications, 1800 University Ave., Madison WI 53705.

Some good places to do a little hard-water fishing: Chequamegon Bay at Ashland for splake; Lake Puckaway in Green Lake County for bluegills; Oshkosh's Lake Winnebago for walleye; Madison's Lake Mendota for perch; and the High Falls Flowage in Marinette County for northern pike.



Reluctant to brave the elements for a bite? Skip the ice and head for the **Milwaukee Public Museum**, 800 W. Wells St. There, with nary a shiver, you'll enjoy a day's fishing "Beneath the Ice" — an exhibition of ice-fishing decoys organized by New York's Museum of American Folk Art. Some of the 200 hand-carved, hand-painted decoys on display closely resemble the fish they represent; others are copies of species that exist only in the minds of the creators. Catch them while you can — the exhibit runs through March 18.

Contact UW Sea Grant, (608) 263-3259; Milwaukee Public Museum, (414) 278-2700.

Wisconsin Traveler is produced by Wisconsin Natural Resources magazine in cooperation with Wisconsin's Division of Tourism Development, Department of Transportation, and State Historical Society.

Auld Lang Skyn

What are you doing New Year's Eve?

Forget Times Square. 1991 will begin with a bang in **La Crosse** when the **Skyrockers** mount Grandad's Bluff to celebrate another year with the color, flash and noise of fireworks at midnight.

The venerable tradition started in 1929 with a small group of amateur pyrotechnicians who couldn't wait until the Fourth of July to practice their passion. Every year since, the Skyrockers have brought the people of La Crosse

Fireworks at midnight! Eric Mosher

and their neighbors in Minnesota and Iowa two spectacular shows from the bluff rising 591 feet above the city.

Festivities begin at noon on Monday, December 31, when the Skyrockers shoot a shell every hour on the hour to announce the approach of the new year. Members of the group give tours of the "launch site" and answer questions about fireworks from noon to 5 p.m. The first fireworks display blasts off at 6 p.m. and the main display lights up the sky at the stroke of midnight.

So, when the inevitable question arises, say you've got a date in La Crosse. Toboggan down the hills below the bluff or enjoy a hearty winter picnic while you wait for the opening salvo. Set up the camera and tripod at a strategic location and shoot a potential winner for the Skyrockers' annual photo contest. And plant a big wet kiss on the nearest snowperson when the clock strikes twelve.

La Crosse Convention and Visitors Bureau, (608) 782-2366; Skyrockers, (608) 782-6281.

Dates and times of events listed in Traveler may change; avoid a hitch in your travel plans by calling ahead!

Sleighted for fun

Outside the snow is falling
And friends are calling yoo-hoo
Come on, it's lovely weather
for a sleighride together ... .

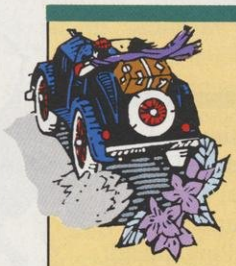
Sleighbells ring, are you listenin'?

Stables, ranches and farms across Wisconsin offer sleighrides as an antidote to the winter doldrums. A brisk trot through snowy fields and forests makes a pleasant, memorable holiday outing for family and friends; bonfires, hot drinks and meals *apres* ride can be part of the fun. There are rides for groups large (up to 40) and small (two people and a blanket).

The Division of Tourism includes a listing of sleighride services in "Wisconsin Winter Adventures," a handy guidebook to the season. When it's lovely weather for a sleighride together, check the list and make reservations. And remember: The horse knows the way ...

Brisk sleighrides quickly become family traditions.
Wisconsin Division of Tourism

For a copy of "Winter Adventures" and the Winter Calendar of Events, write the Wisconsin Division of Tourism Development, P.O. Box 7606, Madison, WI 53707 or call 1-800-432-TRIP.



Need more information?

Travel questions: 1-800-372-2737
Travel publications: 1-800-432-TRIP
Road conditions: 1-800-ROADWIS
Outdoor recreation: (608) 266-2277
Historical Society sites: (608) 262-9606

Make a Date

Shiver your timbers at these outdoor events:

December 29 **Timm's Hill Porcupiner Ski Race**, Ogema, Price County. Cross-country skiers herringbone up to the highest point in Wisconsin — a whopping 1,952 feet! Bring oxygen. $10 entry fee. (715) 767-5287.

January 12 & 13 Bald Eagle Watching Days, Prairie du Sac/Sauk City, Sauk County. View the majestic raptors as they congregate along the banks of the Wisconsin River at Veteran's Park. (608) 266-0545.

January 18-20 **World Championship Snowmobile Derby**, Eagle River, Vilas County. Expert drivers compete for the title. (715) 479-2764.

DNR photo

February 2 **Groundhog Day**, Sun Prairie, Dane County. Feast at a big community breakfast while you wait for Jimmy the G'hog to see the light. Will there be six more weeks of winter? Only his Shadow knows. (608) 837- 4547.

February 23 **American Birkebeiner**, Hayward, Sawyer County. The 19th running of the largest, most prestigious cross-country ski race on the continent brings athletes and spectators from all over the world up North. 1-800-722-3386.

J. Mhrudka

COME HOME TO WISCONSIN ... where you're among friends! For a Calendar of Events, write Wisconsin Tourism Development, 123 W. Washington Ave., P.O. Box 7606, Madison WI 53707, or call 1-800-432-TRIP.

continued from page 28

nesting sites and environmental toxicology.

In the past many injured/diseased birds would simply die in the wild. Now approximately 50 percent can be returned to the wild.

The center conducts field studies to identify critical habitat and to monitor the levels of toxic chemicals in our ecosystem. Mark Martell, an associate scientist, has been radio-tracking bald eagles along the Mississippi River since 1987. He has found that rehabilitated birds not only survive once released but will return to the breeding population and successfully nest.

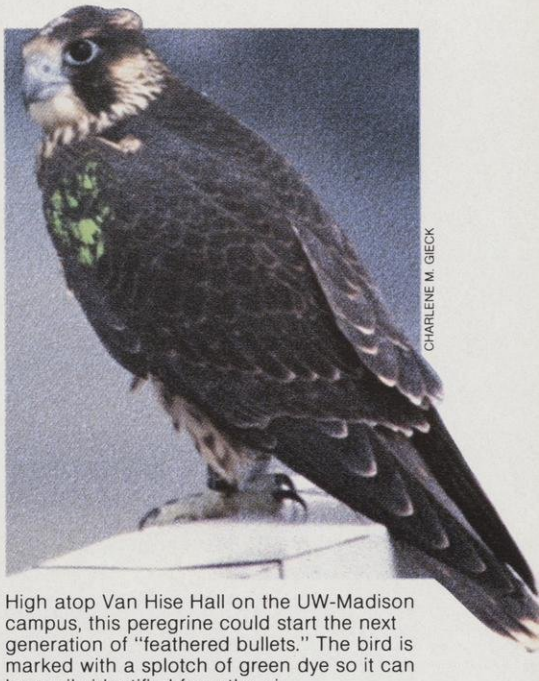
Martell and his co-workers documented several winter roost sites along the Mississippi on privately-owned land threatened with development. *(See our October 1990 story on the Mississippi River.)* Management plans to save these roosts are being written, and teams from The Raptor Center, the U.S. Fish and Wildlife Service, and the Wisconsin and Minnesota DNRs are working to protect these roosts.

These same agencies with the Minnesota Pollution Control Agency and researchers from Michigan State University are monitoring levels of toxic chemicals in baby eagles that hatched along the Mississippi River. This research will indicate the cleanliness and health of the Mississippi River ecosystem, and will help formulate management plans for eagles into the next century.

Martell and raptor biologist Dave Evans climb trees, some over 80 feet high, to get into the nests. Eaglets are carefully lowered to the ground banded, measured and a small blood sample is taken. After the eaglets are returned to their nest, remains from their past meals are collected and sent along with the blood for chemical analysis.

In 1990, blood samples were collected from 10 nest sites on the river.

To continue such work and develop local expertise, The Raptor Center recently developed an endowed professorship in environmental toxicology.



CHARLENE M. GIECK

High atop Van Hise Hall on the UW-Madison campus, this peregrine could start the next generation of "feathered bullets." The bird is marked with a splotch of green dye so it can be easily identified from the air.

Sharing their expertise in many arenas

By working with injured raptors, center staff learn important lessons about bird behavior. Many veterinary students on campus volunteer time and some later join the staff or set up wildlife rehabilitation clinics elsewhere. The center trains these future professionals in handling and caring for raptors.

Innovative surgical techniques developed here are now used by veterinarians all over the country to heal injured birds.

Center staff have important outreach activities beyond medical circles. Their testimony has been instrumental in making environmental regulations safer for birds of prey. In the early '80s legislated changes in

THE RAPTOR CENTER

Young peregrine falcons are examined and banded at The Raptor Center before they are shipped to release sites throughout the Midwest. The ambitious program to reintroduce the extirpated falcon started at The Raptor Center.

Wisconsin, North Dakota and Minnesota set minimum distances for placing bait near leg-hold traps to reduce unintentional raptor trapping. Data provided by The Raptor Center helped convince several midwestern states to ban lead shot for waterfowl hunting years before the federal ban starts in 1991.

More than 100 Wisconsin eaglets have been sent to other states for reintroduction programs. When possible, eaglets are given a health check at The Raptor Center before being sent on to their new home.

Since many injuries and deaths are caused by people or synthetic materials, the center developed education programs to make people aware of these problems.

And what happened to the hapless Segundo? Perhaps the third time will be a charm. In mid-October, staff once again released the patched-up eagle for another chance at freedom. Somewhere over midwestern skies he soars again, with a little help from his friends at The Raptor Center.

Charlene M. Gieck heads osprey, eagle and peregrine recovery programs for Wisconsin DNR's Bureau of Endangered Resources.

RONALD G. ECKSTEIN

Blood samples drawn from eaglets hatched along the Mississippi River shoreline are analyzed for signs of toxicants. The research monitors if fish, small mammals and carrion eaten by eagles are contaminated.

Lend a helping hand

CHARLENE M. GIECK PHOTO BY PATRICK REDIG

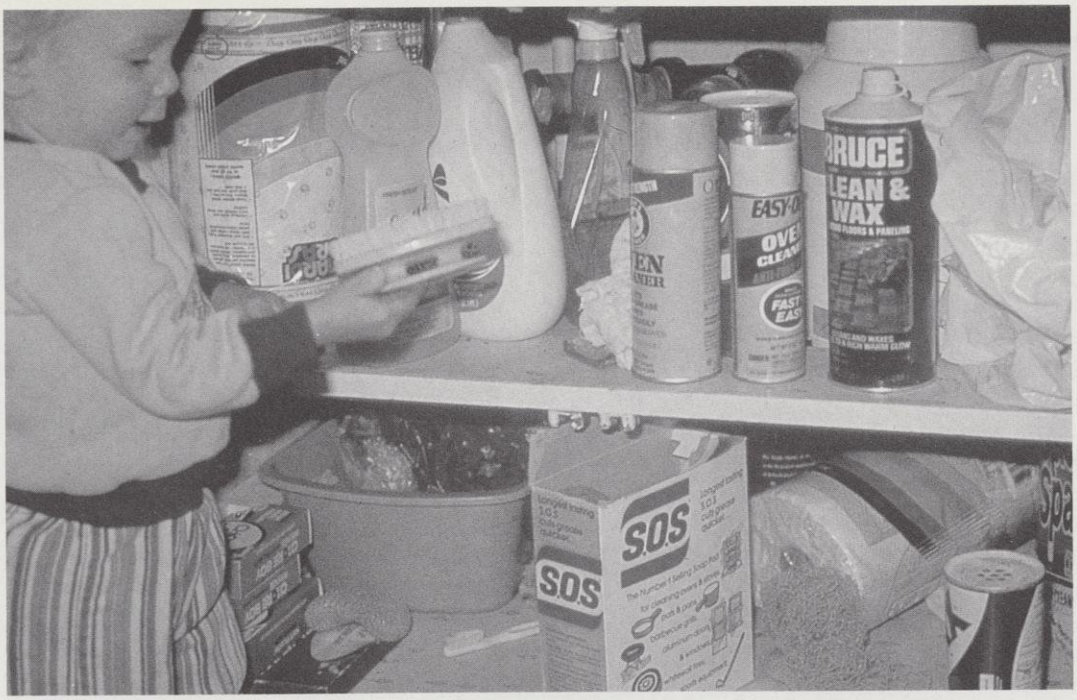
Just as medical bills for humans add up, an animal's stay at the center is not cheap. Treating lead-poisoned swans costs almost $1,500; for a bald eagle the fees can add up to $2,500. Most costs are absorbed by The Raptor Center. Wisconsin DNR is not billed for care of Wisconsin eagles or swans, nor does the center receive direct monetary support from the University of Minnesota. Tax-deductible donations and an "adopt a raptor" program keep the center flying.

In-kind donations from agencies or corporations are welcome. The new facility was donated by Don and Louise Gabbert. 3M Corporation donates bandages and technology. Field equipment (spotting scopes, binoculars, vehicles, canoes, boats, computers) is also needed.

Donations to the Minnesota and Wisconsin tax check-off programs indirectly help The Raptor Center. Joint research efforts pool funds and expertise to get the work done.

The center also depends heavily on students and volunteers for the daily feeding, cage cleaning and exercise of the birds. Wisconsinites living near St. Paul can volunteer time.

The Raptor Center is open for tours. Birds are on display and don't miss the great gift shop where you can find T-shirts, mugs and books for yourself and your bird-lover friends. Special events and trips are scheduled periodically. For more information, contact The Raptor Center, 1920 Fitch Avenue, St. Paul, MN 55108 or call (612) 624-4745.



UNIVERSITY OF WISCONSIN-EXTENSION

More than 90,000 people are injured by household chemicals each year. There are less hazardous alternatives.

Safe at home

Rediscovering cleaning solutions from a bygone era could cut the hazards in your housework.

Elaine Andrews and Liz Wessel

Cleanliness may be next to godliness, but we have become dreadful sinners on the road to cleaner homes. We've sold ourselves on special cleaners for kitchen floors, ovens, sinks, carpets, windows and furniture. We coat lumber to reduce water and insect damage, dab caustic jellies to remove rust from cars and slather on lotions to repel insects. We unleash an arsenal to kill garden bugs, lawn pests, pet fleas and every critter that crawls or flies in the house. Small wonder every house has a rack of bottles, cans and tubes of polishes, solvents, potions and insecticides.

The way we treat our home environment reflects how we care for the global environment. The same advice we've doled out to industry about reducing hazardous chemicals in manufacturing, finding nonhazardous substitutes, handling wastes responsibly and preventing pollution before it happens applies equally to our houses and our lifestyles.

Almost any household chemical can be hazardous if it's used in the wrong way. Some products like spot removers, automobile products, paints and pesticides may contain hazardous compounds that damage skin, eyes and lungs upon contact. Rust removers, drain uncloggers, other strong acids and bases are particular threats. More than 90,000 health-threatening exposures to household cleaners are reported every year to U.S. poison control centers. Roughly 13,000 of those require treatment by a doctor, others can be resolved by first aid measures.

Other chemicals are hazardous to the environment when improperly used, stored or thrown away. Waste oil and products containing petroleum derivatives are made of chemical molecules that stay in the environment for a long time.

To exercise greater control over hazardous chemicals in your home, try following some simple guidelines:

Reduce your use — The fewer hazardous compounds you keep around the house, the fewer you'll worry about. When you face a cleaning chore, painting job or pest problem, try to make do with products you already have. If the job warrants using a new cleaner or repellent, try one of the simple recipes recommended here. Should you decide to buy a commercial product, choose the least hazardous one to complete the job and only buy as much as you can use in a short period of time.

Many problems can be resolved without chemicals by learning what caused the problem or discovering how a pest entered your home. For instance, insect and rodent problems may be cured by cleaning up food scraps, repairing window screens, caulking gaps, replacing weather-

stripping or trapping animals. View chemical treatments as your last alternative, not your first choice.

Recognize the hazard in hazardous compounds — Many products include hazardous grease-cutting solvents. The six most common are mineral spirits, petroleum distillates, acetone, toluene, turpentine and xylene. You really don't need stockpiles of these products for most household chores. The cleaning basics that have kept homes sparkling for decades — water, soap, elbow grease and a few simple compounds — still work.

Be a label reader — Recognize what makes a product hazardous. Most chemical products used at home (except auto, cosmetic and food products) are labeled to highlight short-term health hazards. Just as you look for calorie, salt and cholesterol levels on food labels, read labels on cleaners and other products to find the signal words that indicate the degree of the hazard — CAUTION, WARNING, DANGER or DANGER with a skull and crossbones. CAUTION is the least dangerous while DANGER with a skull and crossbones is the most hazardous.

Labels don't tell the whole story. They only indicate the possibility of immediate health threat to skin, eyes and lungs from inhaling or coming into contact with these products. Long-term health effects from prolonged exposure chemicals are not rated on the warning label. Also, the signal words only describe the hazards of "active ingredients" in the product, not the inactive propellants, colors, fragrances and carriers. These ingredients, often called "inert ingredients" on the label, can contain petroleum distillates, alcohols and other hazardous compounds.

Most containers do not provide any information about environmental damage a product can cause nor do they describe the best way to dispose of the leftover products or nearly empty containers. Furthermore, emergency and disposal information provided on labels is often inaccurate. In an emergency, contact the nearest poison control center. For correct disposal information in your community, contact the County Extension office or the local department of public works.

Rather than throwing out usable products, practice pollution prevention at home. Try some of the following tips:

If you buy hazardous products, only buy what you can use — Here's a case where the economy size is not necessarily a smart buy. The 64-ounce giant bottle of insecticide concentrate may be cheaper by the ounce, but you may need less than two ounces a year to control garden bugs. Why buy a 32-year supply? Look for nonhazardous alternatives that only last a short time. Or purchase the smallest amount of a hazardous compound you think you may use.

Buy products in the right form — Powders, liquids, creams and sticks can be more accurately measured than aerosols. Moreover, aerosol products may use hazardous materials to propel the ingredients. Pump spray bottles do not use hazardous propellants, but still turn chemicals into tiny droplets that can be easily inhaled into the lungs.

Follow directions — Read labels. When directions call for diluting concentrates, wear protective gloves or goggles. Only mix as much of a product as you intend to use. If using solvents or other volatile chemicals, use them outside and protect the ground with newspapers or plastic. If you can't take your project outdoors, open doors and windows and use fans to vent fumes outside.

Don't mix homemade cleaning cocktails unless you're following a proven recipe. Some mixtures are deadly. Never mix ammonia-based products with chlorine-based products. The ammonia/bleach mix produces chloramine gas, a deadly nerve gas used in WWI.

Store hazardous products safely — Store all hazardous products in dry places at room temperature and secured from children and pets. Liquids should not be stored in unheated garages or storage sheds where they can freeze during winter. Freezing destroys useful properties of many products and can damage containers.

Store products in their original containers. Transferring hazardous materials from their original containers to pop bottles and the like is an accident waiting to happen. A Madison woman died recently after drinking an industrial-strength drain cleaner containing hydrochloric acid that someone had stored in an unmarked wine bottle.

Rinse empty containers before disposal — Rinse all residues of chemical concentrates and use the rinse water for the same purpose as the original product.

Find a use for unwanted chemicals — Disposal doesn't make a product less hazardous, it only removes the hazard from your home. Household products are eventually released to the environment through open windows as fumes, sprayed directly into the outdoor air or dumped into water through storm water sewers, runoff, infiltration to groundwater, septic systems or sewerage systems. Sewage treatment plants are not designed to treat many of the hazardous substances we send to them. Heavy metals accumulate in the sludge. Other compounds pass through the system unchanged and drain into surface water or evaporate in the air.

Dispose of products safely — Several communities have organized Clean Sweep days when residents can bring unwanted, spent chemicals to a central location. Such worthwhile but costly services ensure that hazardous materials are transported to landfills and treatment centers for safe handling. Obviously, households should aim to produce fewer hazardous chemicals rather than relying on Clean Sweeps as a long-term solution. County Extension offices offer tips on setting up these programs and the Department of Natural Resources offers grants for community collection plans.

Handling household hazards responsibly is a lot of work. Fortunately, there's an easier way.

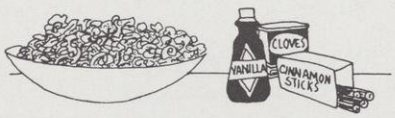
Tried and true recipes for a less hazardous home

Household cleaning is an ancient chore and people tidied up without fancy chemicals for a long time. Simpler times called for simpler cleaners that still work today.

These remedies were drawn from a number of sources. Although they are usually less hazardous than popular products, they should still be used with caution. Their effectiveness has not been tested by formal research or consumer test groups. When trying a new alternative, test it on a small, inconspicuous area first to be sure you'll get the results you want.

Most jobs can be accomplished with six simple ingredients mixed with water: vinegar, soap, baking soda, washing soda, borax and ammonia. Even so, handle these compounds carefully. Ammonia in particular irritates eyes, nose and lungs. Wear gloves and eye protection when mixing and working with ammonia in these recipes and clearly label the containers of all cleaning solutions you concoct.

ILLUSTRATIONS BY HAWLEY W. WRIGHT



Air freshener: Herbal potpourri or cotton balls soaked in vanilla are sweet-smelling. Also try boiling cinnamon and cloves in a small amount of water. An open box of baking soda absorbs refrigerator odors. Borax sprinkled in the bottom of a garbage can controls odors.

All-purpose cleaner: Mix one gallon hot water and ¼ cup vinegar. This solution is safe for all surfaces and can be rinsed away with water.

Ant control: Ants will avoid lines of powders and sharp crystals. Sprinkle barriers of talcum powder, chalk, bone meal, cayenne pepper or boric acid across their trails. Industrial grade boric acid crystals are especially effective as they have little odor. Keep boric acid away from children and pets.

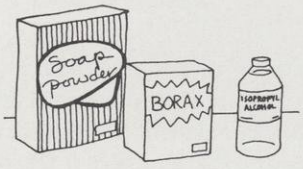
Bathroom cleaner: Use baking soda to scrub surfaces clean and wipe surfaces with a solution of ¼ cup vinegar in a gallon of water.

Blood stains: Club soda and cold water will remove fresh blood stains. Blot it up with a clean cloth or paper towel.

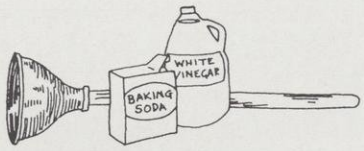
Chocolate stains: Blot the stain with club soda.

Cockroach control: Try a light dusting of borax around the refrigerator, stove and duct work. You can also combine sugar, flour and boric acid to poison roaches; they'll carry the powder back to their nests. (Keep pets and children away from these mixtures.)

Copper cleaner: Dip the copper in warm vinegar, then sprinkle salt on the piece and scrub with a soft cloth. Rinse well with clean water.



Disinfectant: Mix ½ cup each of soap, borax and isopropyl alcohol.



Drain cleaner: Keep drains open and clean with a plunger or metal snake. As a preventative or if a drain becomes clogged, pour in ¼ cup baking soda, followed by ½ cup vinegar. Close the drain until all the fizzing stops, then flush well with boiling water.

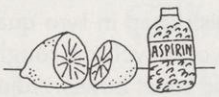
Floors and toilets: A mixture of two to three teaspoons each of borax and liquid dish soap in two quarts of hot water works well on tough jobs like floors and toilet bowls. Adjust the concentration of ingredients to fit the job. Likewise, baking soda and a mild detergent plus a little elbow grease can take the place of powder cleansers. Baking soda mixed with a small amount of bleach is an effective toilet bowl cleaner. (Remember, never mix ammonia with bleach.)

Hand cleaner: To clean hands of paint or grease, massage them with baby oil, mineral oil, margarine or butter. Wipe them dry on a paper towel, then wash your hands with soap and water.

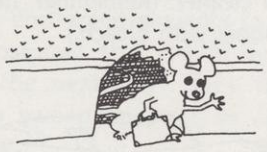
Laundry pre-soak: To remove tough stains, soak the spot in a mixture of ¼ cup borax in two cups of cold water prior to washing. Rub corn meal and water into greasy stains and then rinse the stain with lemon juice before machine washing.

Moth preventer: Cedar chips or lavender can be sprinkled in drawers to discourage moths, or wrap sweaters in newspaper before storage.

Oven cleaner: Dampen the spill and sprinkle salt on it while the oven is still warm. Scrape the spill away when cooled. Greasy spots can be removed with a vinegar-soaked rag. Really tough spots can be removed by dampening the area with water and lightly scrubbing with baking soda and steel wool pads.



Perspiration stains: Weak water solutions of white vinegar, lemon juice or aspirin can be used as a presoak to remove perspiration stains or soak the clothes in a solution of corn meal and water.

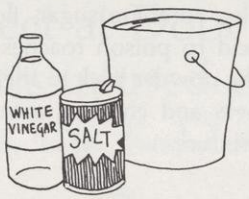


Pest preventer: Clean up the pest's food supply. Repair holes in walls and screens. Caulk cracks and crevices. Add weather stripping to windows and doors. Place vapor barriers beneath buildings. Repair leaks, clean gutters and maintain good soil drainage to reduce dampness that attracts wood-damaging pests.

Pet stains and odors: Try a mixture of ¼ cup vinegar in ¼ cup liquid soap. Rub in the mixture, blot the stain, then rinse with water.

Rust remover: Vinegar's weak acid works wonders on rust stains. Warmed vinegar coupled with some scrubbing will remove rust from dishes, sinks and your teapot.

Silver cleaning: Baking soda and water or buttermilk make fine silver-soaking solutions. The fine abrasives in toothpaste will also brighten your silver jewelry with mild brushing. Also try boiling silver for two to three minutes in a mixture of one cup water, one teaspoon baking soda, one teaspoon salt and a piece of aluminum foil. Rinse pieces well in water and dry with a soft cloth.

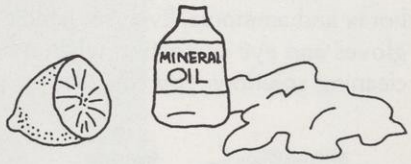


Sinks and countertops: Use vinegar mixed with water and salt.

Window cleaner: Use newspaper dipped in vinegar to scrub windows. A mix of one quart water, a few drops dishwashing detergent and two tablespoons of sudsy ammonia works well.

Spot removers: To remove grease from garage floors, sprinkle the spot with dry cement or fresh cat litter. Let stand for a few hours, then sweep it up. Grease is absorbed by the dry clay or cement.

Stains: General household stains can be cleaned and disinfected with borax solutions.



Wood furniture polish: Look for products containing pure oils like lemon oil, tung oil or almond oil without petroleum distillates. You can also make furniture polishes with a mixture of one part lemon juice to two parts mineral oil or other oil. Don't use vegetable oils to preserve wood because the oils eventually turn rancid and emit foul odors. Be aware that mineral oil is flammable and mineral spirits should not be used.

Wood cleaning: Try Murphy's Oil Soap.

Wood scratches: Mix one teaspoon each lemon juice and mineral oil.

In commercial polishes, look for products containing lemon oil or beeswax in a mineral oil base.

Finally, clean lightly, but more frequently to avoid the need for stronger cleaners. Use preventative strategies at home. Check your home for small spaces where pests can gain access. Learn about pest habits so you can apply the least hazardous alternative when pests are most vulnerable. And remember that your household can still be considered clean without a shiny, "spanking clean" look every day.

Elaine Andrews is a University of Wisconsin Extension environmental education specialist. Liz Wessel is a toxics use reduction specialist for Citizens for a Better Environment.

Readers Write

FAMILY REUNIONS

What a pleasant surprise to find an article about my late Great Uncle Charlie Na Green in my June issue ("Fit to be Fried," Wisconsin Traveler). How I remember Uncle Charlie at family reunions singing his "hamburger song." Charlie still has a niece living in Madison and a nephew in Menasha. For our huge extended family of great- and great-great nieces and nephews, Charlie Na Green will always be "Hamburger Charlie."

Eileen Kasper Smith
Powder Springs, Ga.

How surprised we were to find a clear picture of our father on page 31 in the August 1990 Wisconsin Traveler story on farmer's markets! He has been deceased for nine years now, but he loved to sell at the market in Madison in his later years. Several of us went out and bought your magazine. Sure brought back many memories. We were thrilled with the photo. Thanks so much.

Alice Hoffman
Cambria, Wis.

Imagine our surprise when we turned to page 31 of your August 1990 issue and saw our father, Dewey A. Douma of Randolph, Wis. selling produce at a farmer's market!

Gerrit Douma
Charlotte, Mich.

SAN FRANCISCO SMILE

I want to compliment you on your magazine. I've subscribed to it now for two years and have enjoyed every issue. Each one has been informative, interesting and entertaining. I've learned many things about a variety of subjects, and especially like the Earth Notes section.

Your June 1990 issue had an excellent booklet on fishing. I send my compliments to the people who put it together.

I'm originally from Wisconsin, but now I'm stationed overseas with the military. It's nice to keep in touch with what's happening in the Badger State.

Gary Smith
APO San Francisco, Calif.

. . . NO FURY LIKE A MAIL CARRIER SCORNED

In regard to the special section "A Tale of One City" (August 1990), the fictional account of a community effort to tackle nonpoint source pollution: I found it very informative, but as a rural mail carrier I was shocked by the actions of the character "Sally," who stuffed flyers in her neighbor's mailboxes. This is illegal, as you must know. Perhaps a notice to this effect in a future issue is in order?

Kurt Knoll
Nekoosa, Wis.

Sorry, Mr. Knoll. I checked with the U.S. Postal Service, and you're right. Nothing can be put in a mailbox except official U.S. mail. I promise it won't happen again.

Could you take the padlock off our mailbox now? Thanks.

Sincerely,
Sally Gritzmacher

DNR PHOTO

Hoarfrost on cattails.

continued from page 2

ture must fall below freezing. Droplets of water vapor condense in the air just the smallest fraction of an inch from a subfreezing object. If these supercooled water droplets touch a colder object, they freeze instantly into individual ice crystals. These are very similar to the ice crystals that form snow in clouds except these crystals form on a fixed surface, like a window, and lack the exquisite symmetry of falling snow flakes.

The type of frost or ice painting created depends on the amount of water vapor in the air and the condensation rate. When water vapor is plentiful and condenses rapidly, water droplets freeze on top of cold surfaces just as soon as the previous layers freeze. Feathery ice crystals don't have time to form and an amorphous frost layer or rime forms the sheet that looks like frosted glass. You can't see the individual ice crystals.

When the air is slightly drier and the frost forms more slowly, each crystal has time to form individually before the next supercooled droplet bumps into it and freezes. At these special times a hoarfrost fans out covering every twig, blade of grass and bird's nest with icy needles.

These same conditions produce feathery, detailed window paintings. You can often see individual "ice flowers" on the painting's perimeter. The finest, most intricate paintings form on clear, still, sub-zero nights. Like any artist who works each fresh canvas, no two frost paintings are exactly alike.

The next time you frost a cake, buy frosted glass, or drink a brew from a frosted mug, think how these terms are linked to Mother Nature's cold weather creativity. Her artist is the mythical Jack Frost who has personified frost and cold weather since 1826, when the name first appeared in a British sporting journal.

We are fortunate to live where we can appreciate Jack Frost's artistry and indulge ourselves in flights of fancy on frosty winter mornings.

Anita Carpenter's nature observations are penned in Oshkosh, Wis. A version of this piece originally appeared in her nature column Badger Tracks.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