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Wisconsin
NATURAL RESOURCES

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White-footed mice

GEORGE J. KNUDSEN, Chief Naturalist, DNR

Did you know that Wisconsin has three kinds of white-footed, or deer mice? They are: the northern in forests of the southern three-quarters of Wisconsin; the woodland in forests of the northern third of the state; and the prairie deer mouse, in grasslands of the southern two-thirds. They resemble each other so closely it is unnecessary to point out their difference here.

Very abundant, these attractive mice are a staple food for hawks, owls, shrikes, weasels, mink, fox, coyote, bobcat and other predators. They are easy prey, especially when running across snow on cold winter nights. Tens of thousands are eaten by predators every night in Wisconsin!

They eat seeds, nuts, berries, mushrooms and insects. The ones shown here are feasting on rose hips.

If supplied with a variety of foods, deer mice make cute interesting pets. An aquarium with a tight-fitting screen top, a dry sand or sawdust floor, and paper, cloth or cotton batting for nests is all they need. When handling them, wear leather gloves. They bite!

If you hear tiny animals skittering around in your attic and walls, or "bowling" above the ceiling with acorns and hickory nuts, chances are these little critters are involved! They like it indoors in winter.

Watercolor by Elva Hamerstrom Paulson, Box 1450, Rhinelander, WI 54501

ELVA HAMERSTROM PAULSON

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Front cover:

Brave man dancer. See page 4.

Back Cover:

About 250,000 snowmobiles are registered in Wisconsin. The fee of $12.00 for two years goes for construction and maintenance of public trails — a 7,000 mile system with another 3,000 planned. Many clubs have additional trails, perhaps another 10,000 miles.

Photo by Lisbeth Kuglitsch Quade

Photo by George Knudsen

WISCONSIN DEPT. OF NATURAL RESOURCES

Brave man dancer

The title of this traditional Winnebago dance song might also apply to DNR's Native American Coordinator. Indian dance is one of his accomplishments and it takes a brave man, indeed, to try and meld the worlds of Indian and non-Indian. He's doing okay.

Photos by Dean Tvedt except as indicated.

When Boye Ladd dances, he wears the distinctive colors of the Winnebago tribe, blue and black augmented by the color of the Deer clan, red and white. In one hand he carries a special whistle. The right to blow it was earned in war. In the other, he holds the "dreamcatcher" a child's toy that looks like a spider web. Every piece of the dancing outfit has a symbolic meaning.

This dance interprets a Winnebago song, roughly translated as "Brave Man Dancer." The dancer must communicate a deep reverence for honor, sportsmanship and tradition. Winnebago custom requires that any prizes won be given away to women relatives. The "Giveaway" at the end of the powwow season carries out this ritual.

The song starts and the meaning sets the mood for the dance. Traditional and warrior songs are danced solemnly, never looking back or dancing backward. In competitive dance, Ladd tries to express through footwork and head and body movement the action and beauty of a butterfly or a bird in flight.

In the first part, the creature is sitting on a limb, singing. The notes of the flute are its words.

As the song progresses, it flies into the air circling, diving and spinning in time to the drum. Timing and coordination are very important in the finale. Everything must end at the last beat of the drum.

Continued next page . . .

◄ "Hay-Loosh'-Kah Woh-He' Kah-Nah Wah- Shoe'-Shah-Nah."

▲ "Hay-Loosh'-Kah Woh-he'-Kah . . ."

Now the Dancer is willing to give away anything he wins.

J. WOLFRED TAYLOR, Editor, Wisconsin Natural Resources

DNR and the old Conservation Department have always had a sort of dual relationship with the Wisconsin Indian population. The Indian way epitomizes nature. It is the nearest thing to a human symbol, in an ecological sense, of the universe DNR is charged by elected officials with regulating. Because of this there is great sympathy, admiration and respect for the Native American way—but also many points of friction. In the process of being regulated, the Indian is separated from nature in a very subtle manner. It is a point of tension. Regardless of Indian activism and official repentance about historical injustice, the white man's world of technology dominates. In many cases, it is Indian versus state and federal government and the courts decide. It takes a long time to resolve disputes. But DNR believes there is no need for friction and is working with purpose and success toward understanding, agreement and compromise.

The key individual in making the change is the department's Native American Coordinator, Boye Ladd. Ladd, a native of Black River Falls, is a member of the Deer clan of the Winnebago tribe. His father was a Zuni, his mother a Winnebago. Educated at the Institute of American Indian Arts in Santa Fe, New Mexico, he was an honor student of Indian painting, sculpture and dance.

Ladd acts as liaison to all Wisconsin tribal councils—the Winnebago, Chippewa, Potawatomi, Menominee, Oneida and Stockbridge-Munsee. He interprets DNR actions to them and vice-versa

Continued next page . . .

"Hay-Loosh'-Kah Koh-Dah' Nee'-Gah Chow-Wah'-Dee-Gee." ▼

"Hay-Loosh'-Kah Woh-Hee'-Kah . . ." ►

In the future, the Dancer will always be willing and eager to give.

and plays a similar role sometimes for other state agencies and federal and local government. A principal function is to help with legislation and rule making designed to eliminate conflict and misunderstanding. Ladd also tries to maintain a close relationship with tribal elders and medicine men so that religious and cultural practices do not create rifts.

Ladd believes in and practices the ancient traditions of his people. Because of this and because of his education, his tribal and clan affiliation, his military and other experiences, he has become a leader in the Indian community. Much of his respect, influence and effectiveness are a result of personal excellence in ceremonial religious and fancy dancing. He has been a national champion, has placed first at many powwows. Last August, he was chairman of the "Land of the Menominee Powwow" at Keshena. It attracted 20,000 people, mostly Indians. There were 900 dancers and they voted the powwow the best of its kind in the nation. Because of his position, Ladd was not allowed to compete. However, the tradition went forward. His three-year-old son, Nigel, danced for the first time and to commemorate the event, a traditional "Giveaway" was held. Relatives prepared a dinner. Shawls, yard goods, towels, beadwork and three horses were given away. Religious leaders conducted prayers to honor the Great Spirit.

Joe Bointy, a Kiowa from Anadarko, Oklahoma, wearing the yellow headdress of his tribe, wins the dance contest at the Land of the Menominee Powwow at Keshena.
(Photo by Jeff Smoller)

An important part of Boye Ladd's job as DNR's Native American Coordinator involves interpretation of Indian treaty rights as they apply on and off the various reservations. This can be complicated.

Wisconsin courts have generally held that Wisconsin Indians have no exclusive rights on territories they ceded to the US in exchange for reservation lands. In most cases, when Indians are off the reservation, they're subject to state law regarding hunting and fishing, as well as other activities. Inside reservation boundaries, however, it's a different story. Native Americans can hunt, fish, gather wild rice, trap and perhaps do many other things free of state jurisdiction.

Then there's the matter of what happens to the non-Indian on the reservation. The courts are still deciding whether Indians have authority to regulate non-Indians using the reservation. Can a tribe levy a hunting or fishing fee, for example?

Ladd believes that many issues can be settled by negotiation. Says Ladd:

"My philosophy is that we should negotiate rather than litigate. I'm an Indian and I would never negotiate away any of our treaty rights. But it takes 15 years to go through the courts! A lot of issues can be settled by talking it over, and my job is to open the lines of communication—get the Indian talking to the non-Indian."

When legal roadblocks appear insurmountable, Ladd goes after DNR and other support in the legislative process and has had some success there.

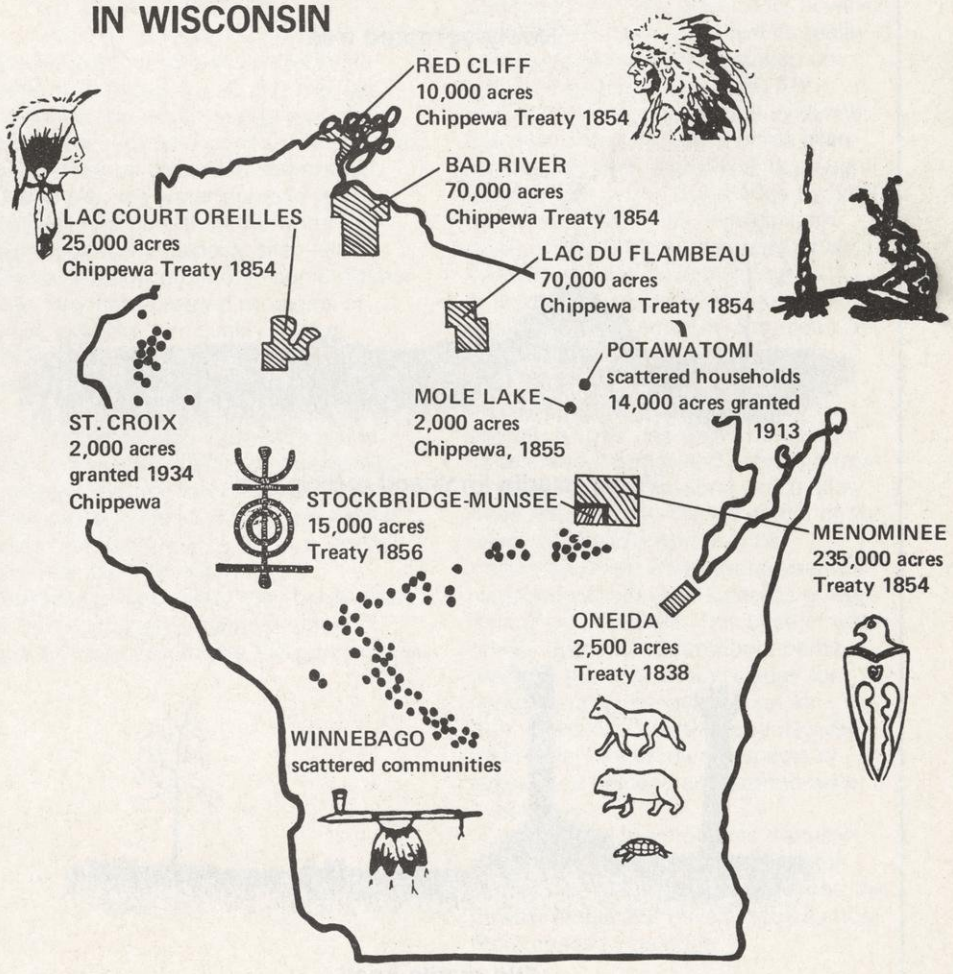
Recently a new law allowed the Winnebagos to take deer for religious purposes. Another law recognizes tribes as units of government for purposes of state funding. Boye Ladd has been instrumental in raising support for such legislation.

But there are plenty of clashes that can test Ladd's talent for negotiation. For example, in 1972, the Wisconsin Supreme Court ruled that the Bad River and Red Cliff Bands have a treaty right to fish in Lake Superior free of state regulation, but added the state could make reasonable and necessary rules to prevent substantial depletion of the fishery. A member of the Red Cliff Band tested that state regulation by setting a net in the Gull Island Shoals Closed Area. The case is now in court and has stirred up Lake Superior sport and commercial fishermen, Indian and non-Indian alike. Ladd is still working to soothe everybody and keep lines of communication open pending the court ruling.

And there are plenty of other issues left! Still in front of Ladd, DNR, the courts and the attorneys, are all the environmental protection questions. Are the reservations subject to air and water pollution and solid waste disposal rules? No tests are in sight yet, but chances are we'll be seeing some.

So Ladd has his work cut out for him. Perpetually caught in the middle, he has this to say about it: "Indians accuse me of being pro-DNR and some DNR people say I'm too pro-Indian. Well, I *am* an Indian, but my main concern is to protect that resource out there. When I get complaints from both sides, I know I'm doing it right. And sometimes you get compliments and that makes it worthwhile. I want to help my people and this is the best way I know of to do it."

INDIAN RESERVATIONS IN WISCONSIN

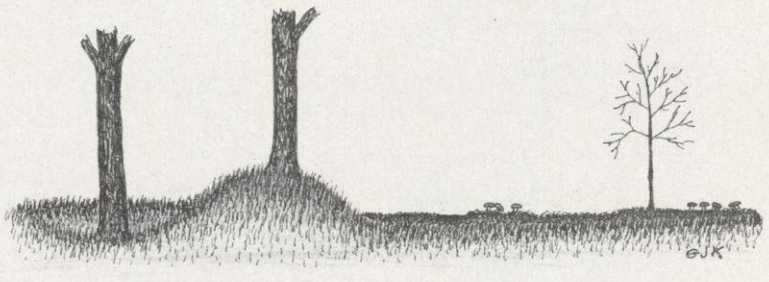


Cradle-knolls

The development of a cradle-knoll

Newly-uprooted tree

Young cradle-knoll and rotting tree



Old cradle-knoll

Drawing by George Knudsen

ALICE and JOHN LYONS, Phillips

In parts of our woods where the trees are not so thick, there are many mounds like someone had dumped loads of dirt. On one side of each mound is a depression. This was a mystery to me until John called my attention to the fact that where the depressions were, a large tree had once stood.

During a storm, trees had been uprooted, and the twisted roots pointed to the sky. They brought up dirt that hung in the masses of tiny rootlets, and stones of all sizes were wedged between the large roots. The hollows are where the roots had been while the trees were standing. They now have a mat of grasses, club mosses and ferns.

In summer, the mounds are covered with ferns, bunchberries, and grasses. Twin flowers hang their dainty bells there. Clintonia's three basal leaves are topped with dainty yellow flowers in spring and navy blueberries later. Princess pine and other club mosses twine around the base like green embroidery.

The shape of these depressions reminded the pioneers of cradles, and animals used them for sheltered resting places. The hollows and mounds were called "cradle-knolls."

A straight low ridge extends beyond the mound exactly where the tree trunk had fallen. We dug into the mossy top and found reddish, crumbly soil of the decayed wood. Mosses of many kinds form a cushion on the ridge, and in it grow ferns and young hemlocks, balsams and pines. The cycle of life and death is clearly illustrated.

Every cradle-knoll has to be very old, for the trees are completely decomposed. The cradle-knolls take us back in our imaginations to forests of other times.

People talk of a virgin forest which leaves the impression the mature trees seen there have always been growing in that place. However, many types of trees have had their time there before the climax forest of the present.

A recent storm here uprooted thousands of great trees and left them in uneven windrows. They lay stacked on each other, and their great roots, sharp and ragged, pointed crooked fingers heavenward. On the windward side, a

deep, ugly hole is filled with water. It is hard to believe this, too, will become a lovely cradle-knoll. We are still shocked that this happened so suddenly to our forty acres and thousands of acres around us.

On much of the forest land, large logging equipment is salvaging logs, bulldozers are pushing roots aside and filling in the depressions. In those places there willl be no cradle-knolls.

In some areas, however, the trees will lay as they fell, and slowly, nature will take its course. First, there will be fireweed and goldenrod. Seeds of aspen and birch will blow in, and grow fast in the abundant light. Deer will increase because of the browse, and there will be birds and small mammals. During this time, balsams and spruce will get a start on the shaded floor, and maples will grow tall, reaching for the light.

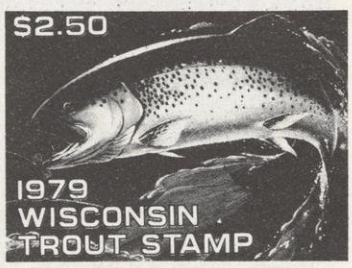
When the aspen and birch mature and are harvested or windblown, the balsam, spruce and maple will take their place. A few hemlocks and pines will be in the shaded recesses, awaiting their time, which will come, for they are patient and persistent.

The cradle-knolls will hold the record of the giant trees and the great storm so future generations can know of it.

Drawing by Georgine Price

A new cradle-knoll. ►

The 1978 Waterfowl Stamp designed by Owen Gromme.



The 1979 Trout Stamp, designed by Martin K. Murk.

Stamp contests

Wisconsin artists are invited to participate in this year's contest to design the 1979 Waterfowl Stamp and the 1980 Trout Stamp.

The contests will be judged by separate panels of art and wildlife experts. Deadline for both is March 15, 1979.

Winners will be announced on March 29.

Artists 18 and older interested in entering can obtain contest rules and details by writing to:

Wisconsin Trout and Waterfowl Stamp
Contests
Wisconsin Natural Resources Magazine
Box 7921
Madison, WI 53707

Walking fern
Drawing by Jim McEvoy

The Oakfield Ledges:
a scenic inheritance of the ice age

PETER TOEPFER, Mining Engineer

Niagara limestone is the surface rock formation of eastern Wisconsin, the same formation that created Niagara Falls. This limestone is hard and resists erosion. It overlies very soft, easily eroded Maquoketa shale. In eastern Wisconsin these formations dip gently eastward, sloping below Lake Michigan, and deeply underlying lower Michigan.

Erosion and later glacial planing have excavated a broad valley, well defined by Green Bay, Lake Winnebago, and Horicon Marsh, where the soft Maquoketa shale reaches the surface. Hard, resistant Niagara limestone walls the east side of this valley in a series of prominent, westward-facing rock ledges and steep slopes. This is the Niagara escarpment. This escarpment is very prominent, marked by high cliffs along the west side of the Door Peninsula, and by other cliffs along the east sides of the lower Fox River Valley and Lake Winnebago. South of Lake Winnebago, the escarpment jogs westward, again forming rock ledges and steep slopes east of Horicon Marsh. Its southernmost prominence is at the old Mayville Iron Mines south of Mayville. Further south, it is concealed by glacial moraine deposits.

The Oakfield Ledges are a particularly interesting part of the Niagara escarpment. They extend for five miles southwest of Oakfield in Fond du Lac County. The rock cliffs are about 40 feet high and surmount a high westward-facing slope. Large rocks that tumbled from the cliffs cover this steep, heavily-timbered hillside.

The ancient glacial planing moved parallel to the cliff face and cut deeply into the underlying clay shale. This weakened the support of the limestone cliff faces, allowing the exposed rock to tilt outward when the sideward support of the glacial ice was removed. Vertical crevices opened along the joint planes, and these great open cuts are the most interesting feature of Oakfield Ledges. The crevices are 40 feet deep with sheer rock walls and are present all along the cliffs. Some are more than 50 feet wide and others so narrow, one can barely squeeze through. Some crevices only 15 feet wide can be folllowed for a quarter-mile or more, but much climbing and crawling through narrow passageways is necessary. Exploring these crevices is a never-ending source of delight to children. For the less active, the top of the cliffs provide easy walking.

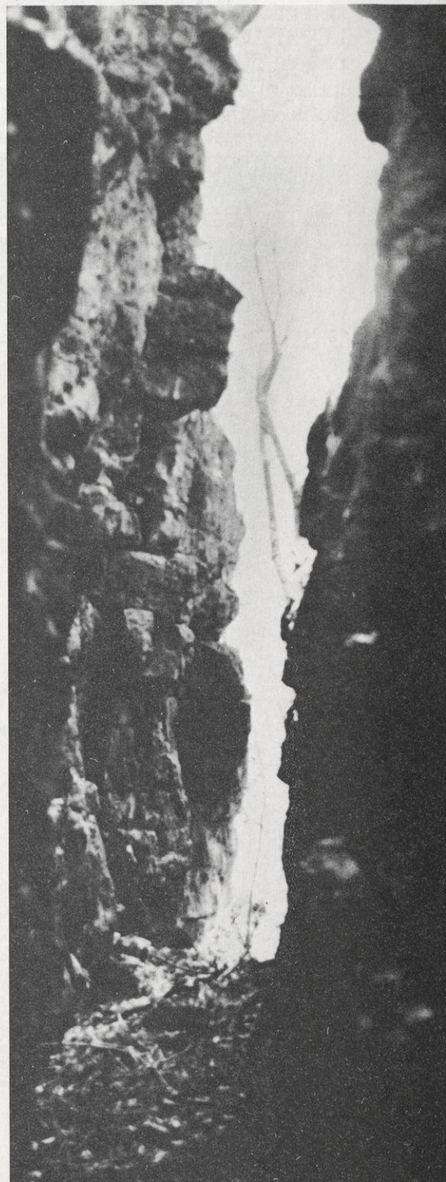
These cliffs are almost unknown, yet few places in the state are more interesting. The rock surface above the quarry at Oakfield has been highly polished by glacial action. Local hunters find the cliffs ideal for hunting fox. The hunter can stalk along the brow of the cliff to spot fox sunning themselves on the rugged rocks below. Mountain-climbing clubs would find the narrow crevices ideal for practicing "chimney" climbing; where the climber inches his way up by bracing his back on one wall and his feet on the other. Those interested in botany will enjoy seeing the walking fern; a remarkable fern found only growing on limestone exposures. Unlike other ferns which have lacey leaves, the walking fern has a broad, unserrated leaf which gradually tapers toward its tip. Where the tip touches the ground (or a limestone surface), a new tiny fern with roots and new leaves seeks to establish a new foothold. Thus the name; walking fern.

Three miles south of Oakfield, the Breakneck Hill Road climbs the cliffs. A large spring, shadowed by great rocks, is at the base. Here one can gather watercress. Just north of the spring, at the face of the cliff, there is a balanced rock supported on a narrow pillar about 35 feet high. About a quarter-mile north of the spring is an interesting small cavern, dimly lit by an opening in its high roof. It can be entered by squeezing through a narrow crevice at the base of the cliff.

The Oakfield Cliffs are one of Wisconsin's unique scenic features. Access to them should be available to everyone.

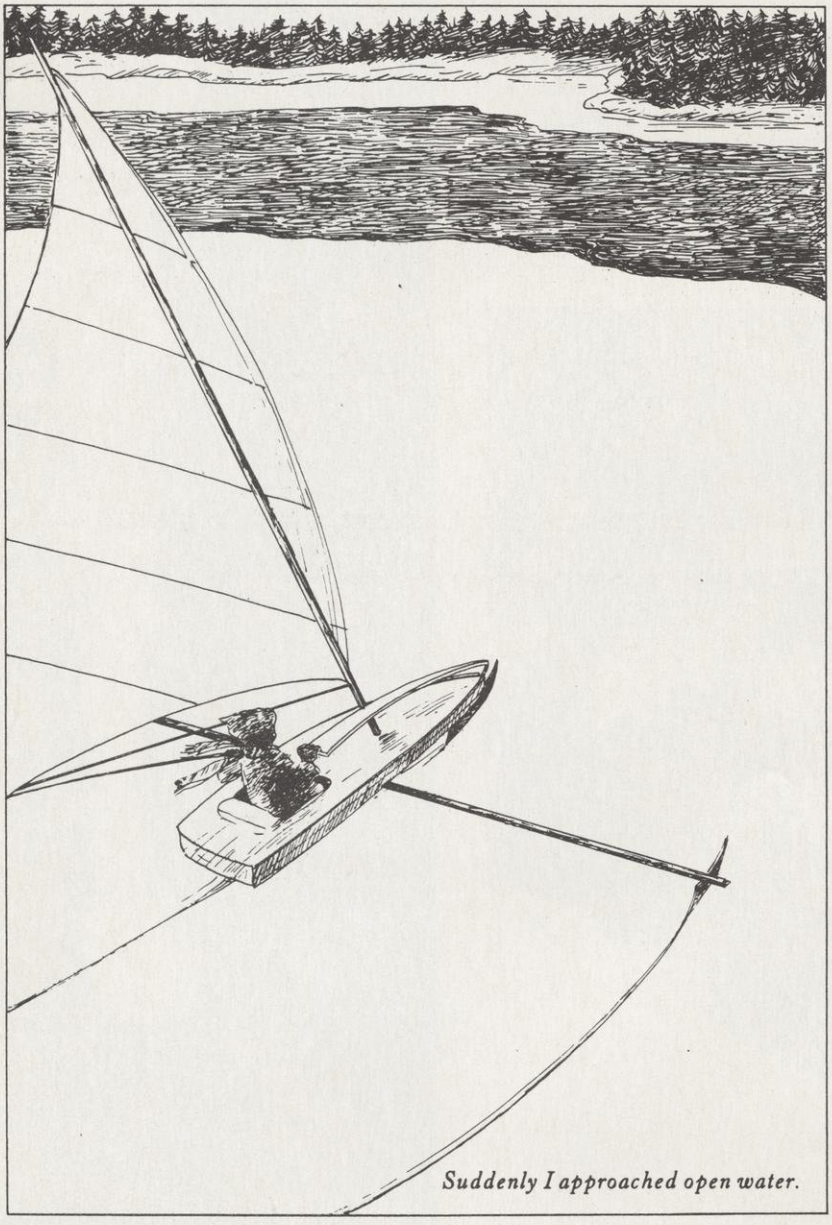
A state park was proposed at Oakfield Ledges in 1973. It was to have included two observation towers, a 10-mile hiking trail, picnic areas and a 105-acre scientific area. Hiking, climbing and exploring would have been the principal recreation activities. The project was tabled at that time because of opposition from some key landowners and from officials in the towns of Oakfield and LeRoy. The proposal for a scientific area, however, remains active. The Scientific Areas Preservation Council hopes some of the area's rare flora and geology can still be preserved even though housing development is beginning to occur at the base of the cliffs. Recently, the Natural Resources Board asked that park possibilities at Oakfield Ledges be re-evaluated.

Typical Oakfield Ledges crevice.



Danger on the ice

This is an excerpt from a Sierra Club book about growing up on a lake in Wisconsin in the 1930's. Published last April, it is full of lore and crafts for today's youngsters. For their parents, it is full of nostalgia. The book THE LONG AGO LAKE by Marne Wilkins — 160 pages, 50 illustrations, glossary and index of crafts, Charles Scribner's Sons, cloth $8.95, paper $5.95.*



Suddenly I approached open water.

MARNE WILKINS

The winter weather was just as tyrannical as that of summer. When we went to Mill Lake during the winter, we brought little sails, ice hockey sticks, plenty of hot thermos bottles, and firewood for toasty bonfires in the snow. It was glorious to catch the wind in your sail, let it pull you on ice skates all the way across the lake and then to tack back using all your skill. My skates were figure skates, but the boys had "hard toes" for hockey, and the hockey games and skating races went on for hours. When we were old enough, we learned to sail my uncle's iceboat. Iceboats are very fast and dangerous. Sometimes the sailing speed was so great, they hardly touched the ice, leaving the driver with little control, but lots of excitement.

Iceboating was even more exciting in our neighboring lake, Lake Geneva. In summer inland races, called regattas, were held on Lake Geneva. In winter as soon as the ice was thick enough, courses were marked out and the iceboat races began. As the lake ice expanded, fissures (cracks) sometimes opened up in the middle like huge rips in the ice sheath covering the lake. Naturally, these were very dangerous to skaters and boaters.

When I first learned to sail an iceboat by myself, the boat I used was a single seater and made for speed. I thought it was wonderful. I climbed in and the minute I was seated, its big sail filled with wind and away we went, boat and me, skimming on its trim runners and barely touching the ice under us. My uncle clocked the speed at better than 50 miles per hour as I sped past him. Suddenly I approached open water. How had I come across so much lake so fast! I stretched for more control of the halyards, and as I did, my hood blew off, my coat unbuttoned, and my scarf blew right across my face. I couldn't see a thing with the scarf plastered across my eyes. All I could do was feel! Somehow managing to keep the sail full of wind, I hauled and hauled until the racer was up on one runner but coming around and pointed toward home in a sharp tack. Whew!

The woolly scarf was snatched away to the winds, and I gradually maneuvered back to my uncles and cousins who were waiting

turns. It was ten degrees below zero, but I was so excited I felt no cold. That night was the last I remembered for a long time. I woke up coughing and miserable, and my blankets and pajamas were wringing wet. I was sure my head was breaking into a million pieces at least. Mother gave me a hot lemonade and tried to comfort me, but when I was next aware of her, it was many days later. She told me I had pneumonia and was not to try to get up. How could I get up with the whole weight of the world on my chest? To this day I still cough all the way down to my boots when winter comes. I don't complain though, because I can still see that open water in my mind's eye, and I know exactly how lucky I am.

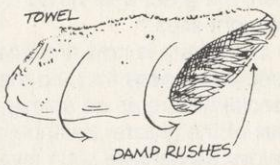
Iceboating and skating weren't the only things going on at the lake. Fishing for ciscos was one of the special features of winter. It required planning and a good knowledge of the lake too. Little shacks were built and hauled out to spots where fishermen thought there might be fish under the ice. Inside the floorless shack, a couple of holes were punched through the ice, and chairs and stools were installed for fishermen to perch on. Sometimes small pails containing coal fires or kerosene burners were added on especially cold days. Ciscos are meaty white fish much like a trout. They like pure cold water and are hard to catch in summer because they stay down too deep. Naturally, it's always a game between fish and fisherman to find which lure will make the catch.

One time when I was still too young to go ice fishing, my uncle came to our house. He was out of breath and his errand seemed urgent. It seemed that cisco fish were biting, and he had no yellow beads which were the successful lure of the day. My mother rummaged through her button box and sewing supplies to see if she had any to give him. Then she remembered that I had a pretty bracelet made of, wouldn't you know, yellow beads. And they were just the right size to string above a fish hook. Without a backward look, my uncle took them, flung himself out the door, and clatter-trapped down the road to the lake in his old fishing car. Of course promises were made about returning the beads, but promises sometimes have a way of being forgotten. In all my growing-up days, I can't remember wanting to have or even to wear any bracelet, much less a gaudy yellow one. Just the same, it was mine and those old fish should have chosen some other color—red for instance.

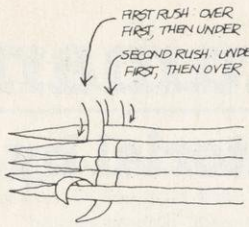
How to Make a Rush Mat

Materials needed: cattail (bulrush) leaves, masking tape, scissors.

Gather young cattail rushes (leaves) and dry them, out of the sun. When you are ready to weave, dampen and wrap them in a towel. Use 18 rushes, each about 1 inch wide and 30 inches long for the long side and 14 rushes about 26 inches long for the short side.

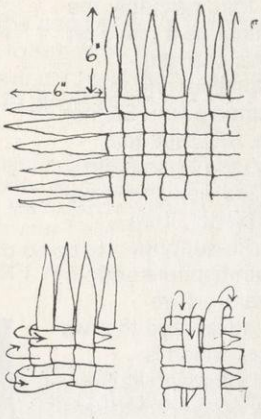


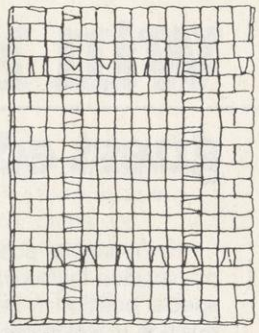
Cut the bottom end to the same shape as the top end with scissors. Now lay the long rushes out flat, side by side, with no space in between. You can keep them in place with a piece of masking tape across the ends.



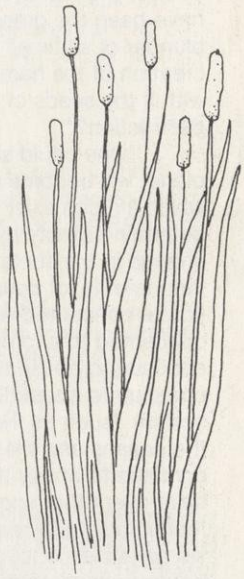
To begin weaving your mat, start at one side with a short rush and work opposite the direction of the long rushes. Put the short one first *over* then *under* the 18 long rushes. The next short rush is placed beside the the first short rush, but it starts by going *under* the first long rush, then over, under, over, under.

Leave 6 inches sticking out at the top and bottom of the mat and at each end. These are turned back and woven into the other weaving so that the edge of the mat has a solid finish instead of a loose, wiggly one.





If you want to make a square mat, use rushes that are all the same length. If you want to make a thicker one, use two layers and weave them as one.



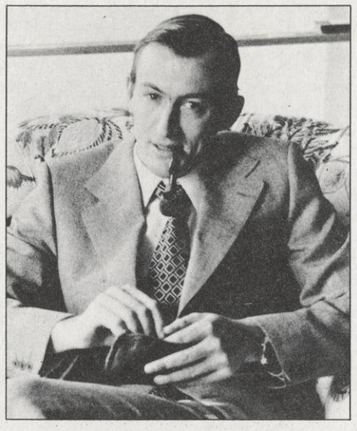
Will humankind survive?

guest editorial by Richard Leakey

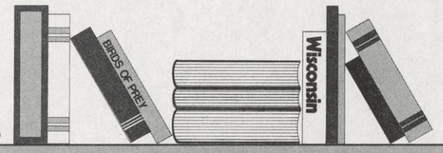
"It is quite possible that the path of evolution that brought us to our special position in the animal world, a position in which our inventiveness and culture allow us to manipulate our environment to an unprecedented degree, is soon to run into a dead end. Will the evolutionary step that handed over to an animal so much power and control over its environment turn out to have been the greatest biological blunder of all time? Can it be that the creation of the human species carried with it the seeds of ultimate destruction?**

"One could say that inevitably the planet will become extinct as a place on which life can exist. This one can determine simply by documenting the change in the sun's temperature. Sooner than later is, of course, the issue that you're concerned with, and I guess I'm concerned to express the view that if we continue to abuse the planet, if we continue to abuse the life-support system (such as the atmosphere and the oceans and the rivers), if we continue to abuse the advantage that we have over other species, which is technology, and reach the point where we are slaves of our devices—then there is a very good chance that the species as a whole could become extinct. If that were to happen, I believe it will happen very soon. I do not think it is something that will go on at its own indeterminate pace. If you follow the trend of technological development and you follow the trend of human concerns and you follow the trends of resource utilization, it is clear that there has to be a dramatic change if we are to get much more than about another hundred years out of our system. And I think we will change. I think we will change simply because we're aware of it, and people are talking about it—not just me but many people are concerned about this issue—they are developing detente, they are trying to get peace amongst nations, and there's a great deal being done along the right lines.*

"There is now a critical need for a deep awareness that, no matter how special we are as an animal, we are still part of the greater balance of nature. Unless we achieve such awareness the answer to the question of when the human species might disappear will be: 'sooner rather than later'."**



*From an interview on National Public Radio
**From *Origins* by Richard E. Leakey and Roger Lewin



Books

WISCONSIN, edited by Jill Weber Dean, 160 pages, hardcover, $24.50, Tamarack Press, Box 5650, Madison, WI 53705. This is another beautiful production from Tamarack Press. It is a book of seasons, a kind of celebration in word and picture of what happens outdoors in our state as the year turns. The photos are impressive. All large and in color, they capture the seasonal mood of words by many fine Wisconsin writers—authors like Aldo Leopold, August Derleth, Robert and Mayo Gard, John Muir, Larry Von Goethem, Dion Henderson, Clay Schoenfeld, George Vukelich and others. Nostalgic and a good gift.

HOW TO BUILD A BETTER OUTDOORS by Bill Vogt, 144 pages, cloth, $9.95; paper $4.95, David McKay Company, 750 Third Avenue, NYC 10017. Bill Vogt is a former Wisconsin DNR employe, now an editor for National Wildlife in Milwaukee. His book recognizes that almost everyone wants to do something to improve the environment, but usually good intentions are as far as it goes. Bill shows how to convert those good intentions into good works for natural resources. His message says that even with limited time, money and knowledge you can have a positive impact on the environment — especially if you join with others of similar persuasion. Examples range from building a bird feeder to organizing a conservation group or working for environmental legislation. Whether we hunt, fish, hike, birdwatch or do other things, all of us who like nature should focus on common goals. Building a better outdoors is a good idea and Bill tells how to enjoy doing it.

BIRD HUNTING TACTICS by David Michael Duffy, 167 pages, paper, $5.95, Willow Creek Press, 801 Oregon Street, Oshkosh, WI 54901. Dave Duffey knows how to hunt upland birds and teaches a palatable lesson on all the kinds in Wisconsin — ruffed grouse, pheasants, bobwhite quail, woodcock, Hungarian partridge and sharptails. He also gives advice on guns, loads, how to hit and what to wear. Duffey is Dog Editor of Outdoor Life magazine and has worked for the Milwaukee Sentinel, the Green Bay Press Gazette and the Appleton Post Crescent. His writing is down-to-earth, folksy. His book will confirm some of the things you already know about bird hunting. And teach a few new ones too.

PEOPLE OF THE LAKE by Richard E. Leakey and Roger Lewin, 298 pages, hardcover, $10.95: Anchor Press/Doubleday, 245 Park Ave., NYC 10017. This is the case for man's evolution as a GATHERER-hunter rather than HUNTER-gatherer. Leakey is a paleoanthropologist and son of the famous Lewis and Mary Leakey who pushed man's history back millions of years. (See editorial.) His book tries to show that our essential legacy was one of cooperation and sharing, not aggression and weaponry. It is based on his findings at Lake Turkana in Africa where he discovered an ancestor of man four million years old. Reconstructing the social, economic and emotional life of mankind's ancient past is what the book attempts. It is a fascinating story. Co-author Roger Lewin is editor for New Scientist magazine in London.

THE DEER OF NORTH AMERICA by Leonard Lee Rue III, 463 pages, hardcover, $12.95, Outdoor Life/Crown Publishers, Inc., 419 Park Ave., NYC 10016. The jacket calls the book "an illustated guide to their lives, their world, their relations with man." There are 300 photos (14 in color) of deer in various attitudes to illustrate biology, life history, behavior and disease. One section covers how deer communicate, how they protect themselves, how their senses interplay and why they move the way they do. Another is devoted to life in spring, summer, autumn and winter and a third delves into census taking, artificial feeding, crop damage, auto fatalities, poaching, deer politics and other problems of management. There are appendices on favored foods, and populations and harvests in the US and Canada. A lot of information!

The readers write

The September-October issue of your magazine had a feature on the Sugar River Marathon. Readers should also be aware that the Paavo Nurmi Marathon, from Upson to Hurley, is held each year on the second Saturday in August. It has a 10-year history and will be run again in 1979. Runners interested in entering should contact the Hurley Chamber of Commerce. ***DR. BRUCE D. GORDON,*** President, Board of Directors; Hurley.

There is a subtle hint in the picture of the hawk overtaking the ruffed grouse on the back cover of the September-October issue. It seems to say that every hawk is a chicken hawk. This mistaken attitude causes many wanton deaths each year. The picture should not have been used in Wisconsin Natural Resources. ***CARL J. McILQUHAM,*** DNR Wildlife Manager; Antigo.

Thank you for your wonderful article on Fred Wilson in your May-June issue.

It is refreshing to see the foresight of men of vision come to fruitation after so many years. It also points out that "Trees are a Renewable Resource" is more than just an industry slogan. With modern Fred Wilsons at work today, we can look forward to continual harvests of natural beauty and wood from our forests in the future. *MICHAEL FEDA;* Center, Texas.

I really enjoyed the September-October issue, but why did the beautiful print of the gold finch carry the writing in the top corner? This, along with many other prints you publish, would be perfect for framing if this information were carried elsewhere. ***HELEN COBBLE;*** Waukesha.

I have a strong feeling for our natural resources and hate to see them controlled by the DNR.

If Wisconsin Natural Resources is published by your bureau, it must be a propaganda sheet to further your cause and not that of nature's. ***C. M. PHILLIPS;*** Platteville.

I hope Jeff Smoller can be induced to do a follow-up on his excellent Mississippi Bluffs article with a similar one on this area's coulees. These gems of western Wisconsin have also been discovered by the developers. ***HILBERT R. SIEGLER;*** Bangor.

Keep up the good work. We love your color pictures.

We'd like to see an article or two about Shawano County—We have a lot to offer around here too! ***LARRY and SANDY KIELBLOCK;*** Tigerton.

Readers are invited to express opinions on published articles. Letters will be edited for clarity and conciseness and published at the discretion of the magazine. Please include name and address. Excerpts may be used in some instances. "Letters to the editor" should be addressed to Wisconsin Natural Resources magazine, Box 7921, Madison, Wisconsin 53707.

Bottoms up

The frigid finger of time dips into the gooey ooze at the bottom of a lake to yield a record of climate, forests and other vegetation.

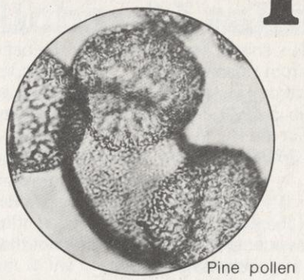
ALBERT M. SWAIN
Project Associate, Climatic Research, UW-Madison

Buried in the mud of a few lakes and bogs in northern Wisconsin lies a 10,000 year record of our northwoods. Preserved in the ooze are the seeds, charcoal and pollen that each forest generation used to write its own signature.

Scientists are analyzing this special mud here and in Washington, Minnesota, Michigan, Pennsylvania, New York and Maine. The idea is to combine this data with studies on tree rings and glacial advances, to resurrect North America's short term climate changes during the past 2,000 years.

Very little was known about the ancient forests of northern Wisconsin until recently. We knew that during the past century tree species in the northwoods changed because of logging, agriculture and fire—that the vast white pinery gave way to aspen and paper birch.

But what about forests that stood there before settlers came? Were they always the tall, silent, white pine cathedrals? Or did fire and climatic fluctuation change their makeup? How often has fire occurred in the past? Are



Pine pollen

there patterns that will let us predict the look of tomorrow's forest?

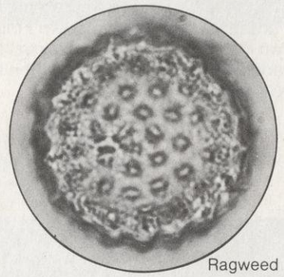
Until now, most pollen studies in Wisconsin could not answer these questions. They could cover millenia but not the short-term changes from one forest generation to the next—the kind of change that might take place in anywhere from a few decades to several hundred years—a blink of an eye in geologic time. To get detailed forest history like this requires an exceptionally clear fossil record. And here and there one has turned up.

Debris blown or washed into lakes continually rains down upon the bottom. As it settles, it forms layers called "varves." Fortunately in spring and summer varves are light in color while those put down when the lake is covered by ice are dark. This annual cycle allows varves to be counted like tree rings, so that debris in them can be accurately dated. Once the dates and the amounts and kinds of pollen are linked, the forest saga unfolds.

Good varves are hard to find. They form in small lakes with special features—steep hills to protect the water from churning winds and plenty of depth so there's little oxygen to support life near the bottom. This limits the number of animals that can stir up the mud. Only seven lakes are known to have good varves in Wisconsin. All are smaller than 50 acres in area and more than 50 feet deep. They are: Ruby, Dark and Little Lakes in Chippewa County; Dudley in Lincoln County; Perch Lake in Bayfield County; Emrick in Marquette County; and Hell's Kitchen Lake in Vilas County.

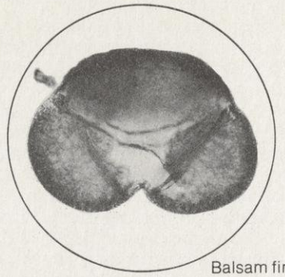
Hell's Kitchen Lake, located in north central Vilas County, is an excellent site for pollen studies. It has 20 feet of varved sediments—and they represent 10,000 years of forest history! So far, 2,000 years have been decoded.

Because the top varves are soft and easily distorted, sediment samples



Ragweed

have to be frozen at the bottom of the lake before they are brought up. To do this, a sampling tool called a "frigid finger" is used. An aluminum cylinder filled with dry ice and alcohol, it has a weighted point at the lower end, fins at the top and a rope that goes to the surface. When dropped, it free falls through the water and penetrates the mud. Temperature on the outside of the frigid finger is minus 100°F. and in five to 10 minutes the varve freezes to it. The frozen crust is then hauled up and put in

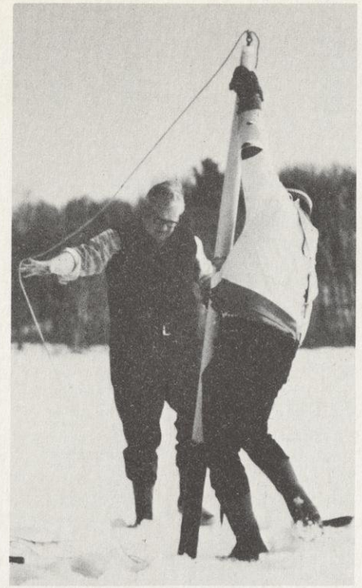


Balsam fir

cold storage. Anywhere from 500 to 3,000 years of sediment may be captured in a single thrust.

Analysis shows that forest cover seesaws through time. There are many little wavers in birch and aspen pollen counts and these were probably in phase with small, local fires. Birch and aspen are a kind of natural band-aid. After catastrophes like forest fires they suddenly appear in force. When only 20 years old, they flood the land with pollen and seed. White pine and hemlock, on the other hand, may take 50 to 120 years to produce pollen full scale.

Frozen on the frigid finger is the rise in grass and ragweed pollen during the last century, fallout from the sweat of early loggers and farmers. As farmers pulled stumps to clear land, grass and ragweed blossomed alongside the crops. As loggers cut white pine and hemlock, pollen counts plummetted. And in the last 40 years, grass and ragweed pollen is down again. Farms in the north did not flourish long. The trees are back.



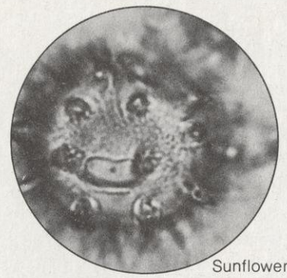
Lifting the frigid finger at Hell's Kitchen Lake

White pine was king twice in the last 2,000 years with yellow birch and hemlock standing alongside. The varves showed little charcoal then. Fires were less common and, therefore, the white pine dynasty flourished during a period when there was plenty of rainfall. This was from about 25 B.C. to 275 A.D. and again from 1378 to 1858.

On the other hand, forests around Hell's Kitchen Lake 1,200 years ago were dry—similar to those of today. The varves show plenty of charcoal, aspen and paper birch. They suggest that the pattern of forest succession may be changing . . . white pine has never before remained as consistently low for as long a time as during the past 120 years. Though pollen percentages dropped four times before, they recovered more quickly. Right now the Hell's Kitchen area is 100 years into the warmest period it has experienced in the past 1,000 years.

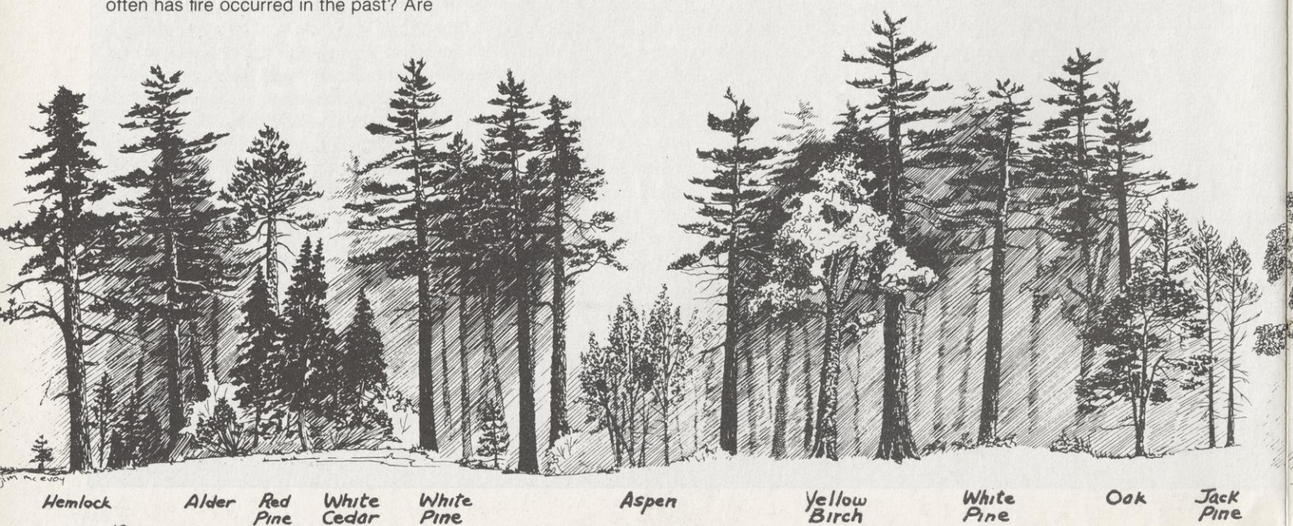
Other detail in the varves show 14 or 15 birch peaks between 25 B.C. and 1828. This means a major fire occurred around Hell's Kitchen Lake about every 130 years.

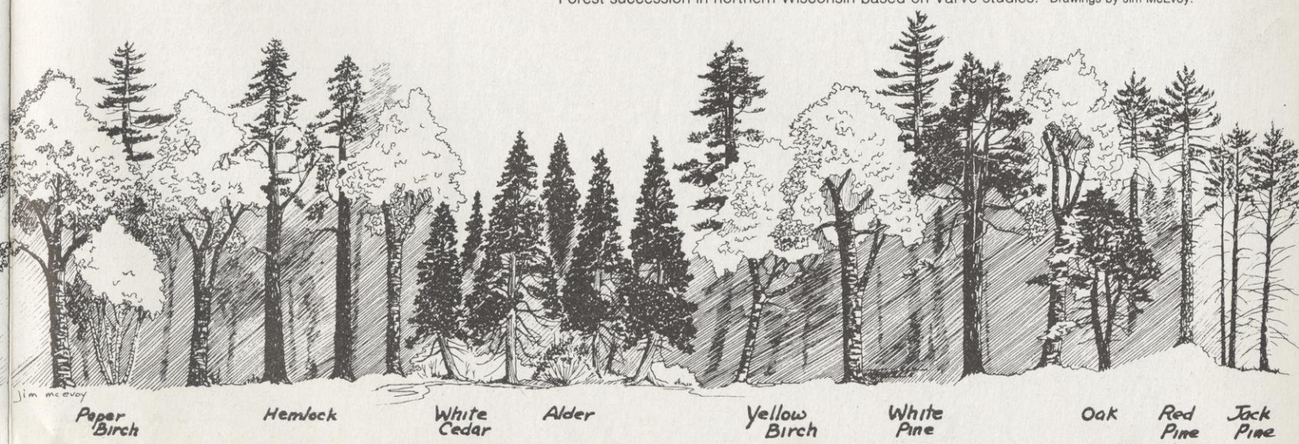
The 2,000 year story told by pollen, seeds and charcoal seems to say Wisconsin's northern forests have been shaped by fire and climate down through the ages. Warm temperatures at the end of the "Little Ice Age" combined with the axe and plow have converted great forests of white pine, hemlock, yellow birch and maple into the present birch and aspen. The few scattered individual hemlock and white pine trees around Hell's Kitchen Lake today may survive to seed the next change. It is difficult to predict when these forests will again resemble the majestic white pine forests that clothed the north 150 years ago, but it will be at least another century.



Sunflower

Forest succession in northern Wisconsin based on varve studies. Drawings by Jim McEvoy.





Buy of a lifetime

A permanent pass to hunt, fish and get into state parks and forests is now available to Wisconsin's Senior Citizens. At $7.50, it's a bargain. Makes a good gift, too!

JEFF SMOLLER, Director, Bureau of Information and Education

Not long ago, the daughter of an elderly Merrill woman invited her mother to Rib Mountain State Park to view the spectacular fall colors in the Wisconsin River Valley below. The senior citizen had never visited the park, although she lived virtually in its shadow.

Once at the park gate, however, the woman learned that her daughter would have to pay admission. The embarrassed mother refused to enter. She felt her daughter had other expenses more important than park admission for an aging parent. The visit was never made.

But after January 1, Rib Mountain and 65 other state parks, trails and forests will be open as never before to that Merrill woman and more than half a million other Wisconsin elderly. With the beginning of 1979, the new Senior Citizen Recreational Card will be available from DNR for a one-time fee of $7.50 to residents 65 or older. (Proof of age is required, by law.)

Any vehicle having a card holder as an occupant will be admitted without payment of the vehicle admission fee. In other words, neither the annual nor daily vehicle fees need be paid. Camping fees, however, will still apply.

There is more good news: Card holders will get more than continuing park visitation rights. Lifetime small game hunting and fishing rights are included. Free fishing licenses are not new. They have been available for residents 65 and older for many years and will continue to be issued with or without purchase of a recreation pass.

Presently, it's estimated 6,700 elderly buy the $5.25 small game license which gives hunting rights for grouse, jackrabbits, fox, squirrels, raccoon, cottontail, quail, pheasant, partridge, snowshoe hare and bobcat. With the new card that number will increase.

"I know lots of fellows who will take advantage of those small game privileges," said an Eau Claire senior, adding, "we've got more time on our hands, you know."

Time also is on the mind of an Oregon man who has long been working for senior citizen rights. Time, he said, is something that the elderly appreciate more and more each day. They strive to spend it well and invest it wisely. He feels time spent in the out-of-doors is time well spent, wisely invested.

In addition, many elderly are investing their time in free courses offered through the University of Wisconsin system. The UW and DNR programs are compatible. One Milwaukee woman, for example, felt it was time she learned more about the trees she so long had taken for granted in her working class neighborhood. After learning some basic botany in the

classroom, she was excited at the prospect of traveling to a nearby state park where she could experience — perhaps as part of her senior group's visit — different trees, shrubs and vegetation in a rural setting. With money scarce, she allowed how the new park pass will mean a more exciting summer in 1979.

Donald Mackie, director of DNR's parks and recreation program, says seniors may find the department's naturalist program offers just the right combination of learning and enjoyment. Naturalists are assigned to many of the larger parks, in some cases, throughout the year. Seniors will be able to make off-season visits to view and learn about the changing and ever-dynamic out-of-doors. Brief nature walks, lectures and demonstrations are not physically taxing and might be "just what the doctor ordered" for relaxation and fresh air.

There is more to DNR parks than naturalist programs, though. Mackie points out that excellent picnic facilities and beautiful scenery are everywhere. There are opportunities for fishing, canoeing and boating. And, short trails abound. Many parks have special facilities for the handicapped, too.

While Wisconsin is just getting its senior citizen parks program off the ground, in years past it has honored the federal Golden Age Passport, available free to persons 62 and older at four cooperatively managed DNR-federal facilities. They are Devil's Lake, Interstate and Mill Bluff State Parks, and the Northern Unit of the Kettle Moraine State Forest — all part of the Ice Age National Scientific Reserve. The cards are still available from DNR in Madison or any of the four facilities.

Actually, Wisconsin's new senior citizen law was some time in coming. Local groups and a statewide coalition worked hard to secure legislative enactment of the $7.50 pass. Because the Legislature requires DNR to recover a substantial portion of park costs from park users, passage of the new law took time. There were differences of opinion to iron out.

But the seniors made persuasive arguments, pointing out, for example, that throughout their lives they had paid taxes to purchase and develop state parks. They said 38 other states gave special park privileges to seniors. And, they even advised the Legislature that their presence in the parks — many times during non-peak times — could even encourage better behavior from other users.

After passage, a suggestion from a Natural Resources Board member, Catherine Conroy from Milwaukee, made the impact of the law even more meaningful for working people. Why not,

asked Conroy, set up a system whereby a retiring worker's friends or relatives could purchase a recreation card as a gift. And so the DNR developed a "gift certificate" which is available to donors at department locations. Because proof of age and residency is required for card holders, an application form will still need to be signed by the card recipient, however.

While no one can be sure of just how many senior citizens will take advantage of the new opportunity, estimates indicate 23,600 cards will be issued in the first six months. There will be an estimated 606,800 seniors over 65 by 1985.

And, if a recent "needs survey" of Wisconsin's older residents is any sign, there's a lot of interest in the out-of-doors in every part of the state. In region after region, seniors who were surveyed ranked outdoor recreation as among their favorite activities. Given the fact that Wisconsin's parks and forests are nationally recognized for their outdoor recreation offerings, the comment of one senior citizen that the pass was "nothing less than a great idea" seems appropriate indeed.

Photos by Dean Tvedt

A dowser won't do

Some say a dowser can find underground water with a willow wand. But most of us doubt it. To know what really goes on down there, it has to be studied.

A water witch can't handle contamination, minerals, subsurface geology, flow or vertical pressure. But research can.

J. H. GREEN
US Geological Survey, Madison

Dowsing is part of ground water folklore and practitioners still function today. A dowser solves ground water problems by pointing a forked willow rod. He merely orders a well dug where the stick dips. But ground water problems go deeper than that. Fortunately, they are generally less severe and less widespread in Wisconsin than in many other parts of the country. We can solve, live with or prevent nearly all of them.

Wisconsin's ground water problems fall into two broad categories: quantity and quality. Sometimes the two may be combined. Quantity problems are those associated with demand that exceeds available supply. The ratio of demand to supply, rather than absolute amounts is of major importance in quantity consideration. Quality problems usually indicate that the water does not meet set standards or requirements for the intended use.

All ground water comes from precipitation. In almost all cases, the water pumped from a well or seeping from a spring was local rainfall or snow sometime in the past. There *are* no magic and permanent sources of pure water except what falls from the sky. When recognized as a local resource that needs local protection, ground water problems can be understood, studied, and probably solved with current techniques.

Ground water is a problem if it's too high or too low. High levels can flood basements, septic systems, lakes and much more. Levels lower than expected mean water that is depended upon is not available. Wells may need to be made deeper. Springs and streams may flow less in summer. Lake shores may recede and wetlands lose their water. In olden days, this called for the dowser. But we can do better.

Natural changes in ground water levels might be anticipated to the extent that precipitation is predictable and that the ground water system can be understood. Where long periods of records are available, correlations of precipitation and water levels may be extended, as predictions, into the future. The predictability of general precipitation trends is approaching reality with new

meteorological techniques and the use of computers. A better understanding of the way ground water systems work is needed before reliable predictions on its availability can be made.

Remembering that water levels change partly in response to local precipitation, it is necessary to understand the local hydrologic system. (As used here, "local" can be any size wherein the elements of study are relatively uniform.) Adequate studies would include defining the surface and subsurface geology—the principal factors that determine infiltration of precipitation and migration of ground water. Needed information would also include the amount, rate and direction of ground water movement. These studies would provide estimates of the natural highs and lows of ground water levels. When coupled with predicted precipitation trends, rising and falling water levels can be routine events rather than surprises.

Unlike in olden dowsing times, the disposal of modern wastes is likely to create water problems. They appear first in the immediate disposal area and then spread to nearby ground and surface waters. In time, they become widespread. There are numerous examples of liquid waste and solid waste that have made their way into the ground water system. Once underground, these wastes may take years or centuries to be flushed away. Problems of contamination of ground water are extremely difficult to solve—but prevention may be possible.

To prevent ground water contamination, wastes must be disposed of in safe places. An adequate hydrologic study of proposed disposal sites can determine, in advance, if a problem is likely to occur. Needed studies at a site would include detailed mapping of subsurface geology, soil permeability, depth to ground water, and all facts concerning the migration of ground water. On a larger scale, more general studies of the same type are needed to describe the regional pattern of movement and the distribution of vertical pressure gradients. Based on these studies, site selection can be made with the assurance that seepage will not cause contamination of adjacent waters.

Ground water is available nearly everywhere in Wisconsin. And if you don't need very much very often, you probably can get it. Mostly, an easy job for a modern dowser. Availability is a problem where water users need more water than the underground system can supply. Problems of this type may be avoided with adequate knowledge of the underground system. Knowledge of the system, then, will allow planning of well spacing, pumping rates, and possibly, pumping limitations. Here again, with advance knowledge a problem may be avoided before an expensive solution is necessary.

Such a systematic approach requires that ground water be traced from where it enters to where it leaves the ground. We must know the amounts of water stored in the rocks and the rates and directions of movement. To understand ground water movement, it is first necessary to understand the regional subsurface geology. This would give us an understanding of the natural part of the system.

Next we need to know how the system reacts to pumping. Pumping tests can define reasonable withdrawal rates for single wells. Adequate distribution of pumping tests by area can define reasonable withdrawal rates throughout a region. At this point, a computer can be used to suggest withdrawal rates, well spacing, and generally the most efficient way to develop the ground water system. It may even be used to predict future problems.

A dowser anybody?

Mining can cause numerous ground water problems. Excavations must be pumped dry so that men and machines can work underground. So local wells may also go dry. The pumped water must be discarded someplace. Commonly, the water pumped from mines is less pure than the water it displaces at the disposal site—either above or below ground. In some places, man may have created problems of water quantity *and* quality by the removal of mineral resources. In other places, he may not have.

Problems caused by mining can be understood only if pre-mining and post-mining conditions are well defined. Lowered ground water levels near the mine are a problem only if pre-existing wells have gone dry or if flow in nearby streams has been interrupted. Discharged mine water may be as good or better in quality than the natural ground water discharge. Only pre-mining information can tell us what conditions might change during mining.

Thorough hydrologic studies are necessary in several areas of Wisconsin because of potential development of large zinc-copper deposits. Necessary studies would include very detailed analyses of water quality throughout the large area of possible mining. Ground water depths, rates, and directions of movement, and vertical pressure gradients must be known. The amount of ground water discharge to springs and streams also should be measured. With such data gathered before mining, the true impact may be evaluated.

All ground water is not created equal. It is of different quality in different parts of the state—due mostly to geologic environments. Water dissolves minerals from the rocks and soil it passes through. In some parts of the state ground water quality differs with depth, the deeper water usually being of poorer quality. In the eastern part of the state, some of the deep water has about one-third as much dissolved chemicals as seawater. Some ground water in the north is almost "pure." General quality conditions are well understood, however, detailed information on present quality is very incomplete and information on quality changes is almost nil. Also lacking is good geochemical evidence that tells where the water came from and exactly how it acquired its present quality. This lack of knowledge by itself is not a problem. The problems are those of man-induced changes, quality "surprises," and possible natural changes, and we need to know what the quality is now so that we can measure any change.

Solution of the ground water quality problem may be the most difficult. At best, we might be able to understand it better and prevent it from getting worse. That alone would allow more efficient use. The full extent of the water quality problem may be understood only after several years of repeated sampling of hundreds of wells throughout the state. This base of water quality data would contribute perhaps only half the needed knowledge for understanding the quality problem. We also would need general and detailed information on nearly all aspects of subsurface geology and ground water hydrology.

Most of the problems discussed are presently being studied to some degree. We are, in truth, far beyond the dowser stage. But he is a good symbol. More needs to be done.

Bayscape perspectives

The natural look of Green Bay is a constantly diminishing resource that needs attention.

PAUL P. ABRAHAMS, Professor, History Department, UW-Green Bay

Not so long ago, the city at the mouth of the Fox River was a trading center with scattered settlements among the marshes, cedar swamps and forests. Shallow draft sailing vessels found their way from distant city markets through the unimproved twisting channel and sand bars of Green Bay to the wharves of Astor and Fort Howard to tap the natural products of the region: fish, lumber and furs. In those days, there were maple sugar camps on the upland ridges of the great basin of Green Bay.

Though inhabitants made many obvious changes as the towns adapted to growth of population and technology, the imaginative eye can still draw on the remnants of the old bayscape to preserve a sense of its natural setting and the historical continuity of the human relationship with it. Indeed, deer and furbearers still inhabit the few remaining creek bottoms. The shrinking fringe of natural shoreline and strategic ridges attract, guide and nurture a multitude of migrating shorebirds, waterfowl and hawks. The rare double-crested cormorant ekes out a precarious existence on the bay.

The relationship between the people and the open space of the bayscape has been a close, if sometimes unconscious one exerting its influence through the distant horizons bounded by the basin ridges; water perspectives of creeks, rivers and flat expanses; the reflection of weather and light on water and woods; in the myriad of activities we call recreation. How long will these essential clues to the old bayscape be available to refresh the eye and lift the spirit of its heirs?

The river shoreline was written off long ago by the industrial need for tracks, docks, discharge and dumping facilities. Pollutants from the industrialized river and from municipal sewage systems finally closed the public beaches on the bay in 1940. Even the carp fishery was driven out by PCB's and moved to northern waters while perch fishing barely survived. In recent years, it has improved because of construction of a new and fabulously expensive sewage treatment facility.

Channel dredging, begun in 1870, has recently led to the filling in of most of the once vast Atkinson Marsh on the west bay shore. Now a dredge spoil island is planned for construction off the east shore. The potency of these polluted materials is not known. A Corps of Engineers dike runs like a scar along a nearby floodable portion of shoreline. The I-43 interchange with state highways 41 and 57 has led to the elimination of more than 400 acres of marshlands that played an important part in screening urban industrial development adjacent to the bay. A mile-long bridge is under construction across the mouth of the Fox River as part of the linkup. It will project asphalt and traffic into a prominent position on the lower bayscape. The last of the historic muskrat trapping in the city is likely to pass with these changes.

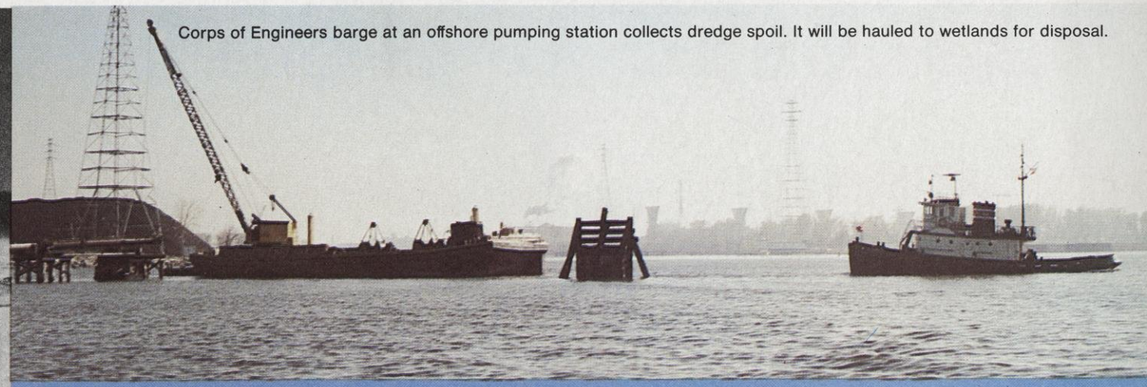
A 200-acre, county-owned, institutional property, economically obsolete and abandoned, is now being commercially farmed and needs to be saved. It includes a creek bottom conservancy area on the south slope of the bay basin. There are no plans to preserve this scenic resource, one site among many essential to the natural bayscape. The other basin heights stretching north along the eastern shore (the Niagara escarpment) and 20 miles to the west in Shawano and Oconto counties are not protected or even recognized as landscape resources.

Decision-making planning boards and farmers and settlers before them, may have rated cedar swamps, ridges and creek bottoms as completely expendable resources. For an urbanizing society to perpetuate that mistake is self-destructive. When deprived of it, most people yearn for an element of nature in their lives. Instead of planning for it on an everyday basis for their constituents, our governments tend to market it to them on a short-term basis at increasingly greater inconvenience and at higher prices. In a way, tourism is an effort to commercialize nature, the result of deliberately obliterating it where people can enjoy it most—near their homes; in and around their cities. It is self-defeating because in the long run nature cannot be sold and enjoyed too, as Door County is likely to prove in a few years. As the facade of nature grows thinner and thinner, people will experience the unpleasantness of an unmitigated excess of humanity.

To secure the grace of the natural bayscape, we must preserve the remaining shoreline and prominent inland features. County and state agencies have set aside about 1,200 shoreline acres mostly on the west shore. The east shore has only Point Sable (103 acres) and the lands managed by the University of Wisconsin-Green Bay (3,700 front feet). The city wildlife sanctuary's 300 acres makes an important and popular contribution. But industrial, highway and urban encroachment is steady while landscape preservation effort is relatively feeble—limited mostly to words on paper and piecemeal acquisition. Even lands specifically set aside and deeded for preservation may be allowed to deteriorate into nondescript plots through well-intentioned meddling or bulldozed into featureless grassed-over areas.

In Green Bay and elsewhere, the next big move had better be the preservationists. Without them, the species faces an increasingly trivialized environment.

Winter improves the bayscape. Photo by Mike Brisson.

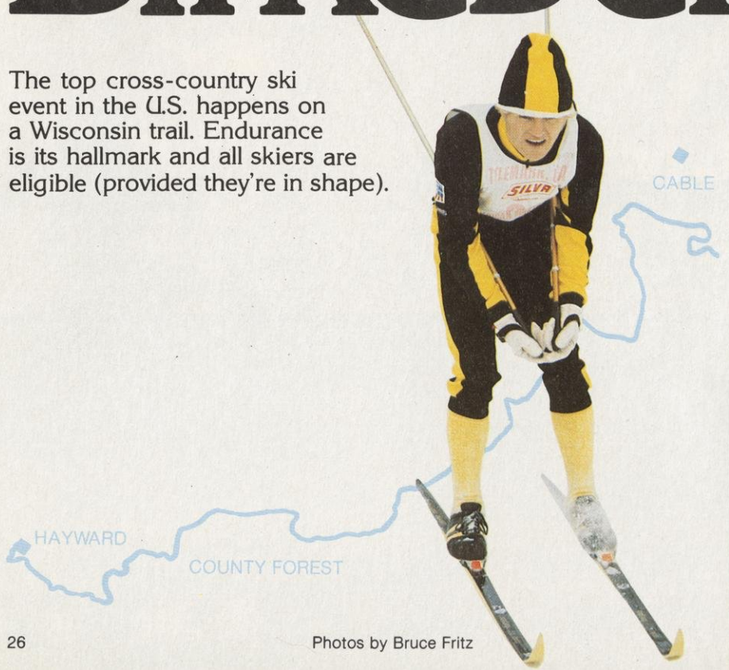


Corps of Engineers barge at an offshore pumping station collects dredge spoil. It will be hauled to wetlands for disposal.

I-43 interchange has consumed over 400 acres of natural habitat.

Birkebeiner

The top cross-country ski event in the U.S. happens on a Wisconsin trail. Endurance is its hallmark and all skiers are eligible (provided they're in shape).



JIM ROTH, Editorial Intern

It was February 23, 1973, when 53 hardy skiers assembled at Hayward for a kind of Scandinavian folk ritual—a 34-mile cross-country marathon race called the Birkebeiner. At the time, it seemed quaint, specialized and not a little exotic. But it caught a trend! When the starting gun fires this year, no less than 3,500 skiers will be on the mark and they'll come from everywhere. In just seven years, the American "Birkie" has become the most prestigious citizen cross-country ski race in North America. Reasons are plain. Big among them are Wisconsin's undulating and scenic ski terrain, soaring popularity of the sport, good DNR and other public and private trails, business necessity and clever promotion.

Last year, 2,717 skiers from 32 states and 11 countries challenged the meticulously groomed Birkebeiner course. The race starts, en masse, at the foot of Valhalla Hill at Telemark Lodge east of Cable and winds up an exhausting 55 kilometers (34.3 miles) to the southwest near Lumberjack Bowl in Hayward. There's also a shorter version, the Korteloppet which is 27.5 kilometers.

The day before the race, spectators and competitors converge on the area and scramble for lodging. The local population of a few hundred suddenly swells to several thousand.

Growth of the Birkebeiner is reflected in ski statistics. DNR planners have projected a 25% annual increase in the number of Wisconsin cross-country skiers between 1975 and 1980. Last winter, 948 or 42% of the Birkebeiner finishers were Wisconsinites (six were DNR employes).

Right now, there are 1,796 kilometers (1,114 miles) of public and private trails in the state. Cross-country skiers will need 2,923 kilometers by 1985 to satisfy spiraling demand. Nationally, in one decade, the sale of cross-country (or nordic) skis has increased 35 fold; from 12,000 in 1967 to an estimated 415,000 pairs in 1977.

Telemark Lodge, catalyst behind the American Birkebeiner, represents in microcosm, cross-country skiing's spectacular growth. At first, in 1947, it was all alpine and resort owner Tony Wise built three runs and two tows. But alpine stopped growing and to lure more business, Wise built 93 kilometers of cross-country trail on Telemark's 2,000 acres. In 1972, only 900 skiers used those new trails but last year there were 19,000. Cross-country skiing was in, and the Birkebeiner was its Boston Marathon.

It's true that majestic mountains and deep powder in the Rockies can lure many alpine skiers away from our less spectacular hills here in the Midwest, but for nordic skiers, northern Wisconsin's snowbelt and rolling glaciated terrain are ideal. It has become a major playground. Some even say northern Wisconsin resembles the landscape in cross-country's native home of Norway, where skis have been a part of life for centuries.

Wisconsin's American Birkebeiner, of course, is named after a Norwegian original. The race there celebrates the rescue of a child prince, Haakon Haakonson, during the Norwegian civil war of 1206. Legend has it that two Norwegian soldiers delivered the boy to safety by skiing the 55 kilometer stretch between the villages of Rena and Lillehammer. The soldiers came to be known as Birkebeiners (birch legs) for the birch leggings they wore. To commemorate their feat, all competitors in the annual 55 kilometer Norwegian Birkebeiner must wear a 12 kilogram pack to simulate the weight of the child prince.

At Telemark, the motivations are more diverse. Some compete because of bets and dares from friends. Others succumb to a primitive instinct that pits human resources against nature. It is a "can do" event, a personal challenge.

And participants come in many shapes and styles with different kinds of multi-colored racing garb and equipment. There are leisurely skiers, with corduroy knickers, wool sweaters, and wooden skis. And then there are the lean competitive types with fine fiberglass skis always at the ready in their one-piece racing suits.

For the casual Birkebeiner with one eye on the trail and the other on nature, there is a virtual smorgasbord of tree species and forestry management practices along the trail. An 80- to 85-year-old stand of white pine dominates the northern run while the midsection winds through 60-year-old oak and maple hardwoods mixed with mature aspen. To the south, near Hayward, there is clearcut aspen followed by redpine plantations planted in neat rows during the 1930s by the Civilian Conservation Corps. An alert and quiet skier might even catch a glimpse of the local wildlife—an exploding partridge or a white-tailed deer.

The Birkebeiner trail borders the valley of the Namekagon River, a designated national scenic river. The Namekagon can be seen from the Hayward airport at the extreme south end of the trail. Other landscape highlights include Mosquito Brook and the 75-foot Seeley fire tower. Birkebeiners also must pole across frozen Lake Hayward before reaching the finish line near Lumberjack Bowl where the World Lumberjack Championships are held in the summer.

Most of the race, about 41 kilometers, takes place on Sawyer and Bayfield County Forest lands. This portion of the Birkebeiner trail is maintained year round exclusively for public cross-country skiing in winter and for hiking in summer. No fee is ever charged on the public part of the Birkebeiner and all motorized transportation is forbidden. Only the extreme north end is on Telemark land where users must pay. The entire course was completed three years ago with aid and advice from two former US Olympic cross-country coaches.

But the course was built for everybody and you don't have to be an Olympian to compete—as school teacher Karen Kuester of Cable can attest. She completed the 1978 Birkebeiner in just over nine hours and 23 minutes, good for last place among Wisconsin finishers and second-to-last overall. The winner, Alfred Kaelin of Switzerland, had finished some six hours and 13 minutes earlier in 3:10.

But 1978 was Kuester's first Birkie, and also her first year of cross-country skiing. As she sees it, finishing further back in the pack has its advantages. The other racers, she said, "were very courteous. You don't have to be good.

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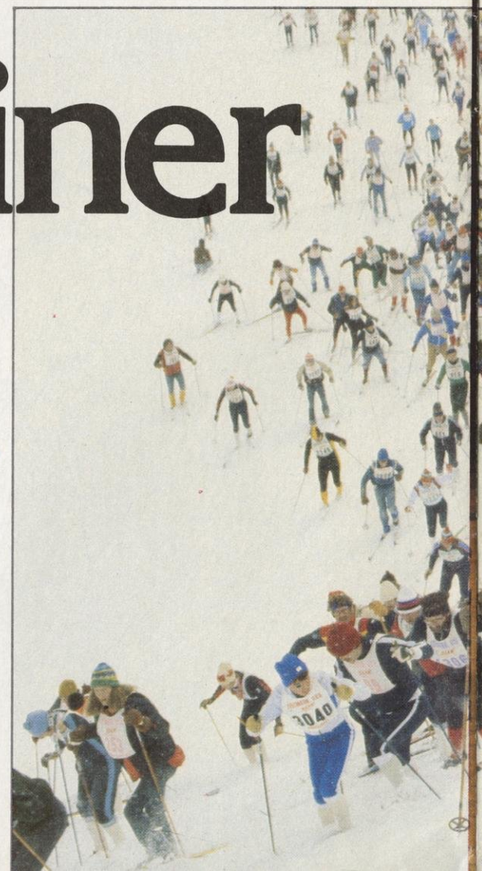
Last year 2700 started.



Photos by Bruce Fritz

Some people will even wait and help you get up if you fall down."

Westby plumber Fred Constalie is one of a select group of 11 skiers who have competed in all six Birkebeiners. The first year Constalie read about the race in a newspaper ad. He and a buddy competed because it was a challenge and "to see if we could do it." They finished dead last out of 53 entrants.

Constalie, 38, suggests that anyone who wants to do well should start training before the snowflakes fly. Once snow arrives, Constalie recommends competing in several of the short citizen races that occur somewhere in Wisconsin almost every winter weekend. These offer valuable experience and build confidence for the fledgling racer, Constalie says.

As a veteran who regularly finishes in the middle of the pack, Constalie warns anyone around the age of 40 to think twice before skiing the race when out of shape. "Sneaking in a couple of casual "K's" on weekends may be sufficient for a young, supple body. But obviously a few 30 to 40 kilometer jaunts before the big one may make the difference between a torturous Birkebeiner and a challenging one."

It should be noted that racers must arrive at certain parts of the course at specified times in order to continue. Last year, 193 Birkie starters never finished. But all competitors crossing the finish line—no matter if they are fresh or rubbery legged—received a three-inch gold-plated replica of the original Birkebeiner shield.

Tony Wise predicts that before long his Birkebeiner will have 5,000 entrants, which isn't overly optimistic considering the 11,000 starters last year in Sweden's grueling 85 kilometer Vasaloppet. Moreover, Wise expects this year's American Birkebeiner to be included in a new Worldloppet League, a cross-country circuit that would consist of 10 citizen races held all over the globe.

Despite growing sophistication of the event, Constalie insists that citizen races will always have room for skiers who practice sporadically, do it for fun, and have limited ability, but manage to finish on sheer guts.

"There'll still be us slobbery citizen skiers! We'll count our blisters after the race and barely be able to walk the next day. But we'll be able to say we did it!"

There are 1,114 miles of cross-county ski trails in Wisconsin.

Hypothermia

There's a rule of thumb that you can survive three weeks without food and three days without water, but without warmth you're lucky to last three hours.

The temperature of the hands and feet can drop 40 to 50 degrees below normal body temperature without lasting harm, but a relatively small drop in the temperature of the body core can kill you. It makes no difference whether the chill to your body comes from exposure in water, wilderness, a house out of fuel, or a car out of gas. If the inner heat of the body is reduced by only about six degrees from the normal 98.6, death can result.

This is called "hypothermia" — a situation where the human body loses heat faster than it can be produced.

Hypothermia is a danger even in mild temperatures, between 30 and 50 degrees F. and most fatal cases occur in this range.

The speed with which hypothermia develops depends on the amount of energy available at the beginning of the survival situation. If you were warm and fresh when you got into trouble your energy reserves may be considerable. If, however, you were hiking over rugged terrain most of the day, energy reserves will be low. The trick is to use your brain to conserve what remains. This is done by limiting muscular action and reducing body heat loss.

There's an old mountaineer's saying, "when your feet are cold, put on your hat." It's a folklore that knew the head is the most efficient part of the body's cooling system. A man who leaves his head unprotected, even in a minor wind, can lose up to half the body's total heat production.

Clothing is important, mainly for the insulation it provides. Duck down stops wind, but it is of no use when wet. The clear plastic that protects against rain does not, by itself insulate against cold.

Wool has the peculiar virtue of drying from within. It keeps the body warm even when wet. Never wear jeans when there is any possibility of exposure to cold. Denim is loose-woven and not only allows water to penetrate, but also permits wind to blow away warm air that should remain trapped between body and clothing. Cotton absorbs water like a wick.

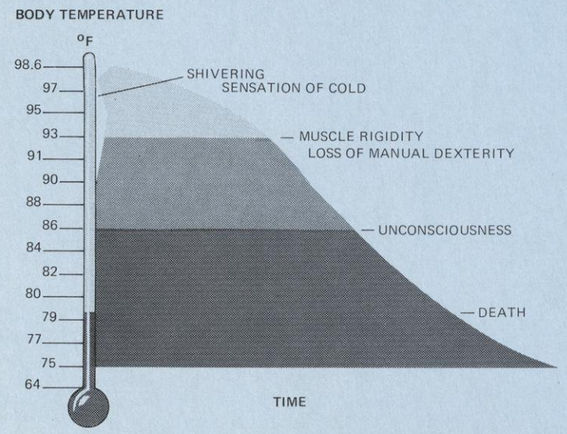
Lives have been saved by the knowledge that clothing may be padded with any soft, fluffy or relatively bulky material. Dry grass, moss, cattail down, and milkweed have all been used in an emergency. Pieces of paper packed inside your clothes also help.

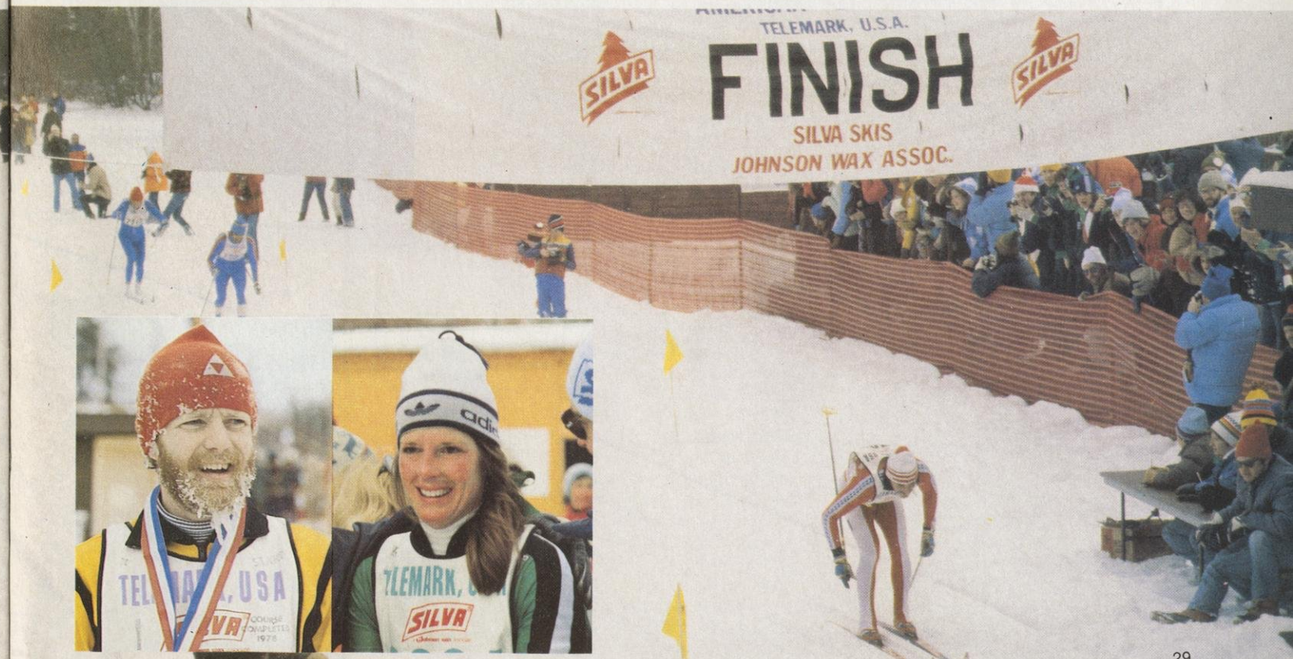
Hypothermia warning signs include intense shivering, poor coordination, stumbling, thickness of speech and loss of memory. Even mild symptoms demand immediate, drastic treatment.

Move the victim to the best available shelter. Replace wet clothing with dry garments or a sleeping bag. Put as much insulation as you can between the body and the ground. Try to keep the person awake. Large amounts of warm, heavily sugared liquids should be drunk. Beef broth is also good. If available, submerge the person in a tub of very warm water not over 100 degrees F.

Hypothermia is deadly because it is so subtle. We have all shivered at some time, with no apparent harm because shelter and warmth were nearby, or we had plenty of energy reserve to produce heat. But the snowmobile, jeep, or outboard motor can easily take us farther into a wilderness than we can walk out of alive. To be prepared; we must recognize that hypothermia is a threat, know how to use our wits and resist any tendency to panic. Then when an emergency comes, we can remain safe and reasonably warm until help arrives.

HYPOTHERMIA





C'mon, take a winter nature hike

GEORGE J. KNUDSEN, Chief Naturalist, DNR

Winter is here! The ground is covered with snow and it's cold outside, so the only thing to do is to stay in your house, watch TV, and wait for spring, right?

Wrong! You can take an eye-opening, invigorating winter nature hike. If you are observant, you will be surprised at all the interesting, even exciting, things revealed by the winter landscape.

Most people hike on foot and that's great, but cross-country skiing and snowshoeing are two excellent, quiet and increasingly popular ways to "hike" too! And you snowmobilers can give your mechanical steeds a well-deserved rest while you hike awhile, warm up a bit and look around a lot.

State parks, state forests and other public lands are only a short drive for most Wisconsin folks. Some of you can hike on your own land and enjoy its winter offerings. Other private lands can also be used when permission is given by landowners.

No matter how short your hike will be, check the weather, dress warmly, wear water-proofed footwear, and a warm hat and gloves, and know where you're going. When taking long hikes in sparsely inhabited areas, especially in big woods, carry a compass, a good map, dry matches, extra food, a hunting knife, rope or strong twine, a waterproof ground cloth or tarpaulin, an extra jacket and mittens, all in a backpack or pack basket.

You can hike just for the fresh air, exercise and mental relaxation or you can take a more specialized hike just to see birds, animal sign, plants in winter or to take photographs. Or you can mix 'em all together and look for anything and everything!

One thing you won't have trouble finding on any of these hikes is an appetite—that'll come naturally!

Planning your route through a number of habitat types will greatly increase chances to see animals and their sign, or to hear bird calls. The brushy edges of woods are excellent places to observe a great variety of things. Forest-covered south slopes with brush patches and openings are comfortably warm for you, and highly attractive to wildlife.

Dozen of species of resident and visiting birds inhabit Wisconsin in winter. They include: majestic bald eagles that can be seen flying or perched along open water stretches of the Wisconsin and Mississippi Rivers; soaring red-tailed hawks; big chisel-billed, fiery-crested pileated woodpeckers; noisy, ever-alert bluejays and tiny, sassy, scolding chickadees. You'll be pleasantly surprised at the numbers of birds you'll see if you really try and haven't forgotten your binoculars.

Mammals are generally more difficult to see than birds, but gray fox and red squirrels are common exceptions, along with bounding cotton-tailed rabbits. If you're lucky, and quiet, you may see a deer, mink or weasel.

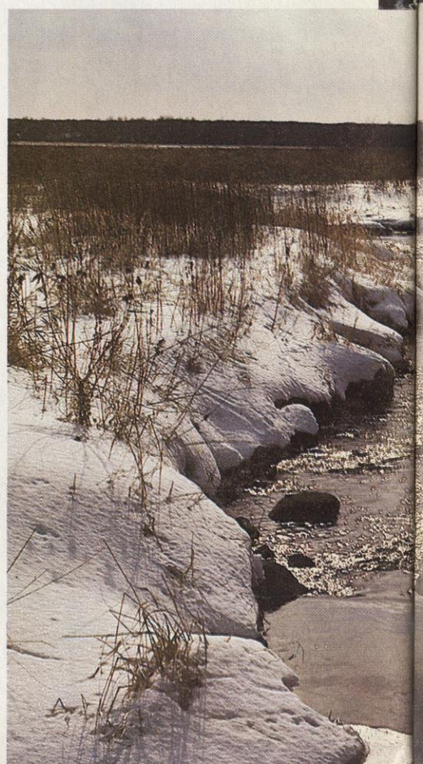
If you want to be an animal detective, look for the sign left by animals in freshly-fallen, soft snow. This is really fun, and easy since birds and mammals leave all kinds of obvious evidence in the snow. Look for tracks of single animals, well-worn game trails, feathers, hair, droppings, tree dens, burrows in the snow and "forms" where animals have rested. Where animals have fed is evidenced by holes scratched through the snow, gnawed, nibbled, and nipped plants, empty nut shells and pine cone scales on the snow, wood chips on the snow below fresh holes made by woodpeckers, predator-killed animals, etc. Follow a set of animal tracks and try to figure out what kind of animal made them, what it did along the way, if it flew off, climbed a tree, tunneled under the snow, rested, ran, jumped, or crawled into a snug den. If you see the tracks of "Bigfoot," go home and watch TV!

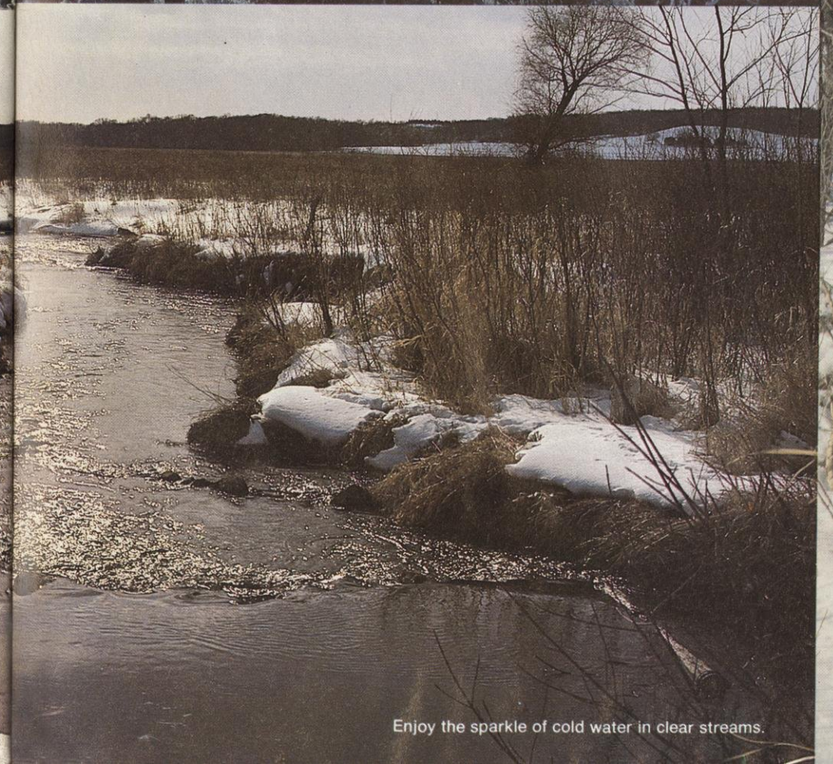
Leafless but not lifeless trees and shrubs offer dandy silhouettes, bark colors and textures, buds of various sizes and colors and leaf scars with interesting shapes and surface designs. Pines, cedars, spruces and firs, evergreen ferns, gray and green lichens and green mosses contrast nicely against the pure white snow. The variously-shaped dead forbs and the graceful grasses should not be ignored, especially since they furnish so many nourishing seeds for birds and small mammals.

The sea of snow itself and its snowdrift "tidal waves," hoar frost on trees, icicles, cold, sparkling streams and fantastic sunsets (and sunrises, if you can get up) along with any combinations of the other observations I have suggested, will add much to your adventures in Wisconsin's snowy landscapes.

One final thought! When your fingers, toes, cheeks and nose are stinging from the cold, just remember that under that cold, cold snow lie the crisply-frozen, dead bodies of billions of mosquitoes! You'll feel better instantly!

Hoar frost.





Enjoy the sparkle of cold water in clear streams.

A pileated woodpecker dined here.

Photos by George Knudsen

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