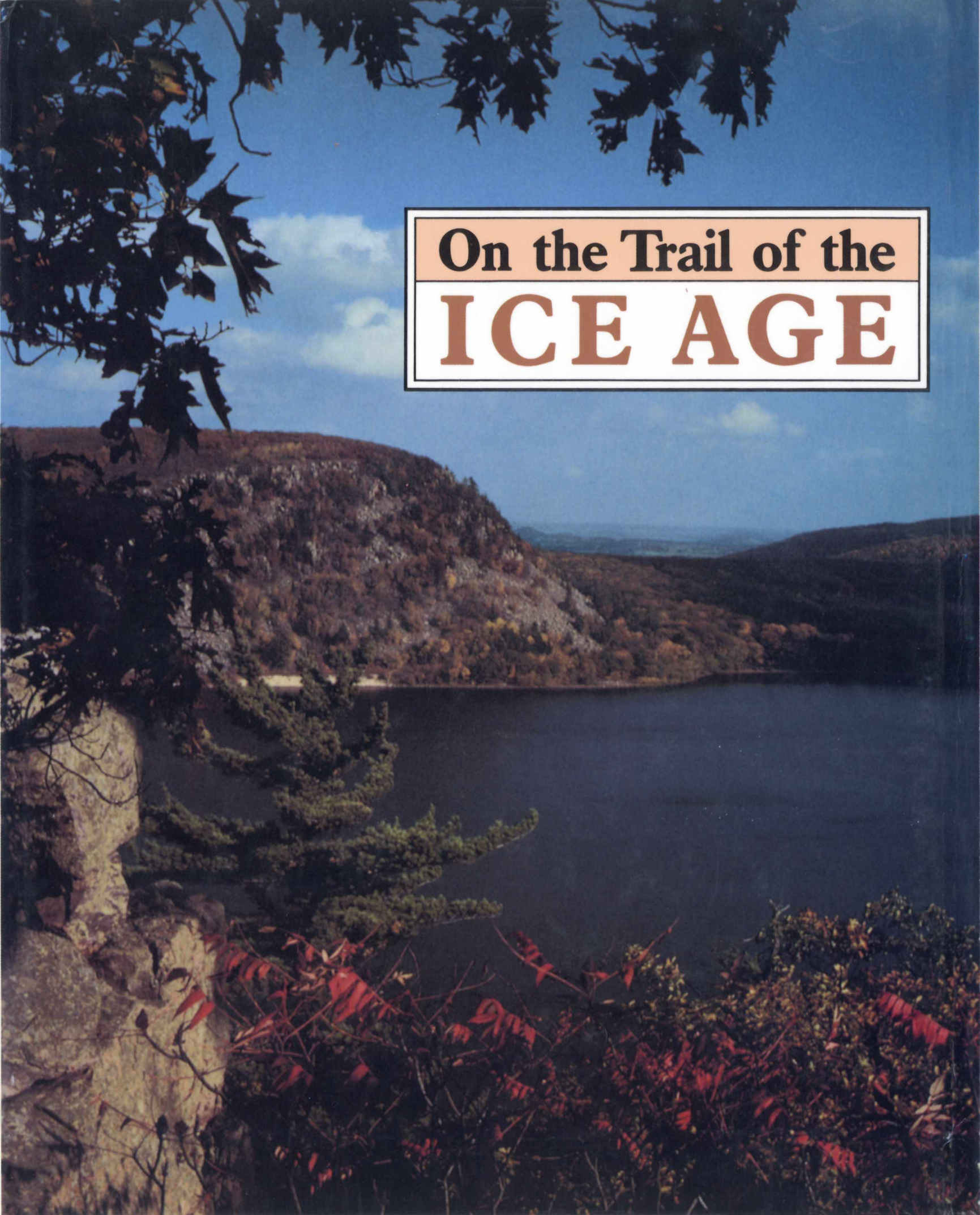

On the Trail of the
ICE AGE

On the Trail of the Ice Age is a guide for the hiker, biker, cross-country skier, and motorist who wants to visit Wisconsin's Ice Age country. This is the planet's most notable collection of the deposits left by the retreating glaciers ten thousand years ago. Here are the moraines, hills ground up by the lobes of the melting glacier; peak-like kames; snake-like eskers; cigar-shaped drumlins; and thousands of glacial lakes, swamps, and kettle-holes.

The visitor can find these deposits assembled in the Ice Age National Scientific Reserve, nine areas ranging from Two Creeks Buried Forest, the Campbellsport drumlins, the Kettle Moraine, the vast waterfowl paradise known as Horicon Marsh, Devil's Lake (where the glacier and the bedrock were locked in mortal combat), the driftless area that the glaciers missed, and the picturesque dells of the St. Croix River. Along the way you may traverse the Ice Age National Scenic Trail, following the moraines for a thousand miles from Green Bay to the Minnesota border.

More than just a guide, the book tells the story of the 30 years of citizen-government cooperation behind the Reserve and the Trail; the place of Wisconsin's Ice Age in the world's glacial history; the "birds, bees, beasts, trees, butterflies, bugs, and boulders" to be met along the way; and some of the fascinating men and women who were nurtured by the land of the Ice Age—Father Marquette, John Muir, Aldo Leopold, Frank Lloyd Wright, Thorstein Veblen, Frederick Jackson Turner, Carl Schurz, Bob La Follette, Georgia O'Keefe, Alfred Lunt and Lynn Fontanne.

There are 30 color illustrations, numerous black and white illustrations, and 25 maps.

On the Trail of the Ice Age

Also by Henry S. Reuss

The Critical Decade: An Economic Policy for America and the Free World

Revenue Sharing: Crutch or Catalyst

To Save a City

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On the Trail of the ICE AGE

A Guide to Wisconsin's Ice Age National Reserve and Trail for Hikers, Bikers, and Motorists

Henry S. Reuss

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P.O. Box 422
Sheboygan, Wisconsin 53082-0422

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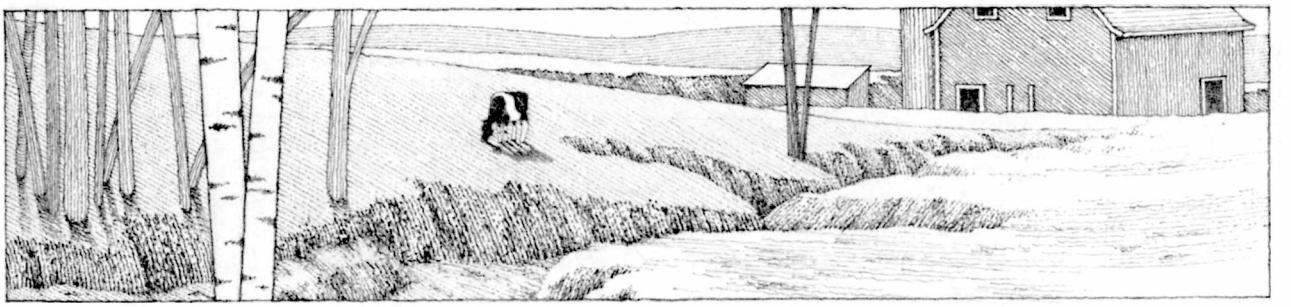
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FOREWORD



After 30 years of concerted effort by the federal and state governments, and especially by Wisconsin citizens as individuals and in private groups, the Ice Age Trail is now taking shape as it winds from the sands of Door County, past Milwaukee, past Madison, switch-backing in the north central part of the state to drive west to the St. Croix River border with Minnesota. And the Ice Age National Scientific Reserve, from the ancient trees uncovered at Two Creeks Buried Forest to the rapids and pot-holes of Interstate State Park, is now substantially completed.

Together, the Trail and Reserve offer the visitor a green corridor a thousand miles long, a frontier festooned with history and nature and scenic beauty.

Besides celebration, this book has a more practical purpose: to keep you from getting lost along the Trail, by a segment-by-segment description of the hiking portions of the Trail—how to get on it, what roads and towns you are near, the special Ice Age features of the area.

This guide follows a tradition set by the Codex Calistinus, which directed pilgrims of the Middle Ages along the Compostella Trail. On that grandfather of all long-distance trails, which was created shortly after the year 1000, pilgrims marched through France and Spain to the shrine of St. James at Compostella. The Codex told the hikers—kings and cardinals, peasants and vagabonds—where campsites and water might be found.

The Compostella Trail was built in that burst of energy when the Millennium of the year 1000, instead of ending the world after centuries of barbarian wars, ushered in a Golden Age of creative achievement. An optimist in 1990 could hope that at the second Millennium, that of the year 2000, the world will not end its centuries of war in a final nuclear blast, but instead will find its way to a new Golden Age of creative achievement. A system of linked greenbelt /trails could be among these creations.

The Ice Age legacy in Wisconsin is for the hiker, bicycler, cross-country skier, motorist, camper, and outdoor-minded. There are a lot of us. Some 12 million people live on the edge of the Ice Age National Scientific Reserve and Trail, in Chicagoland, Milwaukee, the Twin Cities, and a thousand other Midwest communities.

Saving our Ice Age heritage has come in the nick of time. Gasoline for trips to the Appalachians and Rockies is costly, suggesting that joys closer at hand need to be explored. And the new awareness of physical and mental health calls for an enhanced opportunity to stretch a leg and to breathe clean air close to home.

This book tells how the glaciers molded our land, how air and water and plants and animals made it fertile for farm and forest, how the moraines resisted both farming and forestry on their crests and so survived until today, how the glacial lands influenced the men and women who grew up upon them and in turn offer people a sanctuary today.

Since the Trail is constantly being improved, this guide starts getting obsolescent at its publication date. Those who come after us will have to write the next edition.

Meanwhile, the proceeds of this book go entirely to improve the Trail...so buy another copy for a friend!

HENRY S. REUSS
July, 1990

CHAPTER ONE



WORKING TO PRESERVE THE WISCONSIN ICE AGE LEGACY

The Beginnings

In the mid-1950s Ray Zillmer, Milwaukee attorney, outdoorsman, mountaineer in the Canadian Rockies, and hiker, had a dream—to preserve the evidences of the Great Wisconsin Glacier which covered most of the state ten thousand years ago. He envisaged a thousand-mile-long national park, to be called the Wisconsin Glacier National Forest Park, that would both tell the tale of how our land was formed and bring the joys of the outdoors to the nearby millions.

People listened. In 1957 Zillmer led a group of enthusiasts over the glacial moraines from Wade House in the Kettle Moraine State Forest to the St. Croix River on the Minnesota border. Among them were Bill Norris, chief editorial writer for the Milwaukee Sentinel; Bob Bliss, publisher of the Janesville Gazette; J.J. Werner, the Madison pharmacist-outdoorsman; and Ernie Swift, the Rib Lake naturalist and former director of the Wisconsin Conservation Department. The group returned full of enthusiasm for the proposal.

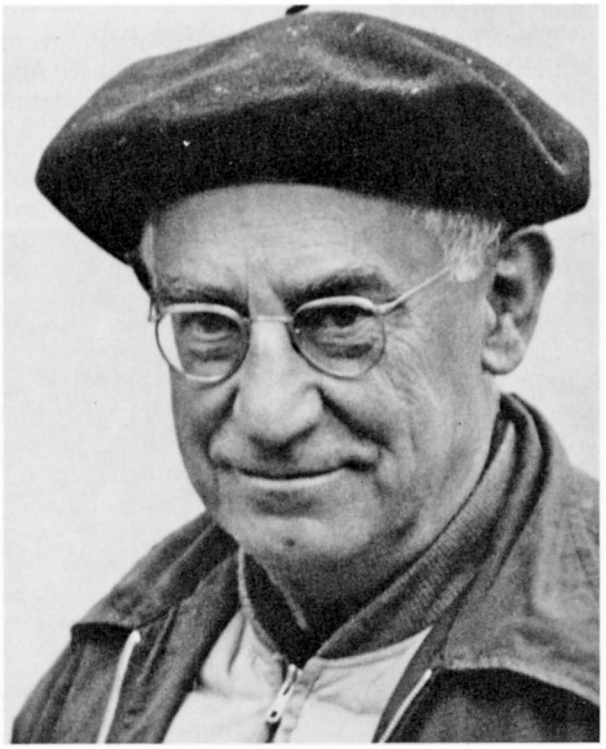
The project was given a boost in 1961 when Supreme Court Justice William O. Douglas came out from Washington to lead a hike through the moraines of Sheboygan County. He had sparked the creation of the Chesapeake and Ohio National Canal Trail, and for years had hiked the towpath along the Potomac. A friend of wild places everywhere, Bill Douglas became a vigorous supporter of the Ice Age Trail. Other public figures who have hiked, and boosted, the Ice Age Trail include Secretary of the Interior Stewart Udall, his brother Chairman Morris Udall of the House Interior Committee, Wisconsin Governor Tommy Thompson, Acting Governor Martin Schreiber, Senator Gaylord Nelson, and Congressmen David Obey, Tom Petri, Jerry Kleszca, Bob Kastenmeier, Steve Gunderson, and Jim Moody.

The Ice Age Reserve Is Created

Meanwhile, the National Park Service sent a team to Wisconsin to evaluate on the ground the Zillmer proposal. Its generally favorable report enabled legislation to be shaped, and the lengthy process of securing congressional passage began. The initial law setting up the Ice Age National Scientific Reserve was signed on October 13, 1964—a monument to Ray Zillmer, who had died in 1960. The act's stated purpose was "to assure protection, preservation, and interpretation of the nationally significant features of the Wisconsin glaciation, including moraines, eskers, kames, kettle holes, swamps, lakes, and other reminders of the Ice Age." It directed the Secretary of the Interior, in cooperation with the state of Wisconsin, to prepare within two years "a comprehensive plan for the protection, preserva-

tion, and interpretation of outstanding examples of continental glaciation in Wisconsin."

The Scientific Reserve set up by the 1964 law differed importantly from the original Zillmer concept of a thousand-mile-long national park. This, it was felt, would be almost impossible to administer. The law, therefore, directed that the plan should select certain outstanding areas for the Reserve's units. State and local governments were to own the land in these units, with the overall Reserve to be included in the National Park system. To assist Wisconsin in acquiring this land, the law authorized appropriations not to exceed $750,000, or 50 percent of the acquisition cost, whichever was less.



Ray Zillmer

In May, 1968, somewhat behind the two-year schedule, the Department of the Interior and the Wisconsin Department of Natural Resources completed their "Comprehensive Plan for the Ice Age National Scientific Reserve." Nine areas, totalling 32,500 acres, were recommended for inclusion in the Reserve—Two Creeks Buried Forest, Manitowoc County, 30 acres; Sheboygan Marsh, Sheboygan County, 80 acres (in 1980 replaced by the 10,899 acre state Horicon Marsh Wildlife Area); Northern Kettle Moraine State Forest, Sheboygan and Fond du Lac Counties, 15,000 acres; Campbellsport Drumlins Area, Fond du Lac County, 3,600 acres; Cross Plains, Dane County, 160 acres; Devil's Lake State Park, Sauk County, 8,840 acres; Mill Bluff State Park, Monroe and Juneau Counties, 930 acres; Chippewa Moraine, Chippewa County, 2,940 acres; Interstate State Park, Polk County, 920 acres. The plan recommended that the costs of development and of interpretive facilities for the Reserve were to be shared state—75, federal—25; the costs of operation and maintenance 50-50. Finally, the plan directed the National Park Service, in cooperation with the Wisconsin DNR, to prepare "a study of the suitability and feasibility of an Ice Age Trail across Wisconsin."

Federal appropriations to support the 1968 Comprehensive Plan were forthcoming. A second Ice Age Act, this one dated October 21, 1970, provided federal aids for development of each of the nine units, not to exceed 25 percent of the cost of each, and not to exceed $425,000 overall.

The Ice Age National Scientific Reserve was officially dedicated in August, 1973. At Dundee Kame in the Northern Kettle Moraine State Forest, Secretary of the Interior Rogers Morton made the dedicatory speech. Surveying the nearby kames and moraines, the Secretary allowed that in his native Kentucky, the folks would just have called them "hills," but that he was nonetheless proud to welcome the Reserve to the National Park System.

A third piece of Ice Age Reserve legislation was the March, 1980, amendments to the National Parks and Recreation Act of 1978, increasing the amount which the federal government could contribute to Reserve development from $425,000 to $2.5 million. This was based on the projection that the remaining development would cost $8,013,000. Subtracting the initial $425,000, which had already been spent by 1980, this left an authorized federal share from 1980 onward of $2,004,000—the federal government's agreed-upon 25 percent share.

The Ice Age Trail Takes Form

Once the Ice Age National Scientific Reserve Act of 1964 had rejected the idea of a thousand-mile-long national park, and had laid it down that instead the Reserve's pearls were to be hung on the string of a citizen-created Ice Age Trail,

citizens went to work. For the last quarter-century volunteers have been planning, laying out, constructing, and maintaining the Trail along its course from Door to Polk counties. Today close to one-half the Trail is hikeable, and almost 250 miles have been officially certified as part of the National Scenic Trail.

The legislative break-through came when Congress by the Act of October 3, 1980, gave the trail National Scenic Trail status, on a par with the Appalachian and the Pacific Crest Trails. The Act directed that the Trail should follow the route outlines in "On the Trail of the Ice Age," the 1980 guide that was the precursor of this book. The National Park Service was instructed to produce a Comprehensive Plan for the new Scenic Trail.

This the National Park Service, in consultation with an Advisory Council that included many of the old-time Ice Age enthusiasts, did in its 200-page Comprehensive Plan of September, 1983. The Plan amounts to a constitution for the Ice Age Trail, and has served the public well. It sets forth the procedure for obtaining official National Park Service certification for future sections of the Trail; prescribes how the Trail shall be marked; and defines the route as that set forth in the October 3, 1980 statute, adding that "the trail should follow the terminal and interlobate moraines as nearly as possible." Deviations from the approved route are permitted, absent the consent of Congress, only where they are relatively minor and are agreed to by all parties.

By mid-1990, just short of one-quarter of the Trail's 1,000 miles had been officially certified by the National Park Service, almost all of it on public lands—the Kettle Moraine State Forests; Devil's Lake, Hartman Creek, Pike Lake, and Interstate state parks; the state Ahnapee, Sugar River, and Tuscobia trails; the Chequamagon National Forest; and numerous county forests and parks.

That leaves completing the Trail pretty much up to the volunteers, and to what they are able to acquire from private landowners. "Whenever possible, the trail should utilize public lands," says the Comprehensive Plan, adding "The purchase of private lands should be minimal." "An informal agreement, easily revocable by the owner" is approved by the Plan, and its Appendix D contains an "Oral Easement Record Letter" form.

Happily, the Ice Age Trail volunteers are currently on a roll. Considerable sums in charitable contributions have been raised, and scores of parcels of strategic land have been purchased. The blunt fact that money is not easy to raise ensures that these purchases will indeed be "minimal," and that reliance will also have to be placed on informal landowner agreements.

Good news in 1989-90

In the nick of time, the state of Wisconsin has come to the rescue. The legislature enacted the law of November 25, 1987, providing that the Ice Age National Scenic Trail should also be the Ice Age State Scenic Trail. Matching funds for acquisition of trail by volunteer Ice Age groups was shortly provided.

Then, by the Wisconsin Stewardship Program which became law on August 3, 1989, the Ice Age Trail made a great leap forward. That program provides, starting in 1999 and continuing for 10

Justice William O. Douglas



years, $25 million each year for a variety of conservation projects.

Here are the new state sources of support for the Ice Age:

1. *For DNR acquisition of lands within existing DNR project areas,* $8.6 million annually is targeted under Section 23.09 of the Wisconsin Statutes. The Trail could definitely use DNR land inholdings in a number of existing DNR project areas, including Lapham Peak in Waukesha County, Devil's Lake in Sauk County, and Lowe's Lake in Washington County.

2. *DNR matching grants for land donations* of $500,000 annually is set up under Section 23.293(4) and (5), as a 67 percent match for all private donations to the State Ice Age Trail Program.

3. *Still a third source, $1 million a year, under Section 23.175, is for participation by either the DNR or private groups in the new state trails system,* of which the Ice Age Trail is a part. Here the grant could be as much as 100 percent. The Ice Age Trail can thus compete with other state trails at this third fountain.

4. *Under Section 23.096, non-profit organizations like the Ice Age Park and Trail Foundation may receive DNR grants for up to 50 percent of the cost of a particular land acquisition.* The "pot" for these grants must come out of other expenditure categories—a serious hitch. Fountains 2, 3, and 4 have an overall annual amount ceiling of $500,000 (Section 23.09(2q)(c)).

Not quite as glorious as the Wisconsin Stewardship Program, but still welcome, is the word from Washington. In President Bush's 1990 State of the Union speech, he called for a 10-year program for the National Forest Service to plant a billion trees a year, largely on privately owned recreational land such as that comprising the bulk of the Ice Age Trail. Many sections of the Ice Age Trail have long ago been denuded of their forest cover. Creating a 1,000-mile long greenbelt throughout Wisconsin would not only benefit trail-users but retard the global warming which comes from our excessive burning of fossil fuels. The tree-planting program, scientists estimate, would absorb as much as 3-5 percent of air-polluting carbon dioxide.

The Ice Age Trail was always intended to be a citizen-government partnership. Recent developments in Madison and Washington bring this closer to reality.

The Foundation and the Trail Coordinators

Madison has become the place for governmental administration of the Trail. That is where the DNR is located, and that is also where the National Park Service's Ice Age Trail business is carried on, along with the affairs of two other NPS long-distance National State Trails: the Lewis and Clark and the North Country (which also traverses Wisconsin).

Citizen support for the Ice Age, financial and administrative services, and Trail acquisition and protection, are supplied by the Ice Age Park and Trail Foundation, located at 630 Riverfront Drive, Sheboygan, WI 53082-0422. The 26 directors of the Foundation are from all the areas of the Trail. As of mid-1990, they were David L. Kinnamon, Thomas J. Drought, Terry J. Kohler, Donald J. Beyer, Alan W. Dunwiddie, Jr., Joyce Erdman, Ody J. Fish, Brent M. Haglund, L.B. "Buzz" Hardy, Forrest D. Hartmann, Norman C. Huth, Warren P. Knowles, E. David Locke, Howard Mead, Henry S. Reuss, Sue J. Riordan, Robert P. Rusch, Dan Small, Bernard N. Brouchoud, Adam Cahow, Barbara Roberts, David Phillips, Sally Freckmann, David Lovejoy, Dr. Robert Cromer, and Robert M. Donner.

Each county along the Trail's route has a Trail Coordinator, and in most cases a county trail chapter. As of mid-1990, Trail Coordinators were:

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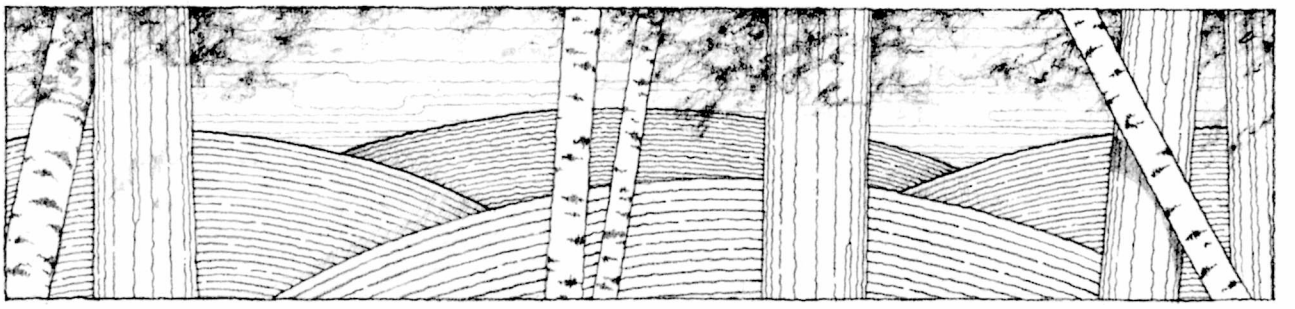
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CHAPTER TWO



THE GREAT WISCONSIN GLACIER

Wisconsin's leading terrain feature—the remains of the Great Wisconsin Glacier—influenced the state's frontier history. It deeply affected the economy of forest and farmland. It molded the character of the people.

Today the remains of the Wisconsin Glacier—its moraines, kettles, kames, eskers, drumlins—offer solitude for the multitude of hikers, bicyclers, skiers, and campers who are turning in increasing numbers to this natural treasure.

Let us first ask: how did it all come about?

When the Glaciers Came

Before we get too pompous about our glaciers, we should recall that the Ice Age has taken up only about 2 million years of the 3 to 5 billion years since time began—only about 1/2000 of the total.

A couple of billion years ago or so, what is now Wisconsin was a series of volcanoes rising from the sea. (Rib Mountain near Wausau is the remains of one.) The lava—igneous rocks—that poured out mixed itself with sedimentary rocks that were carried by wind and water when the mountains crumbled. Sandstone in the western part of Wisconsin, limestone and shale in the east, and granite in the north, make up the state's bedrock.

Wisconsin moved through pre-geological history; the Precambrian period, back to 3 to 5 billion years ago; to the primary (Paleozoic) period 575-225 million years ago; through the secondary (Mesozoic) period 225-65 million years ago; through the Tertiary period 65 million-2 million years ago; through the fourth or Quaternary period, consisting of the Pleistocene (or Glacial) Epoch (from 2 million years ago to the end of the last glacier, the Wisconsin Glacier, some 10,000 years ago); and the Holocene (or current, post-Glacial) Epoch, the last 10,000 years.

At the beginning of the Pleistocene Epoch, or Ice Age, as the earth grew cooler, great portions of the Northern Hemisphere accumulated more snow than would melt away in the short summers. As the remnants of one year's snowfall piled upon another, the weight of thick layers of accumulated snow gradually produced huge masses of glacial ice. When the glaciers moved, parts of the earth moved with them.

Early in the 1800s Swiss farmers began to suspect that there once had been an Ice Age because the boulders in their pastures were obviously erratics, probably transported from Scandinavia or other far-off places. This concept of a former vast continental ice sheet was carried to America in 1846 by a young Swiss geologist, Louis Agassiz (1807-1873). Agassiz and his followers discerned evidence of the North American ice sheet from polished and scratched rocks, rounded hills, and valleys choked by glacial sand and gravel.

What the Glaciers Covered

During the Glacial Epoch, ice covered one-third of the earth's land surface. (Today, one-tenth of the surface is covered by ice—in the Arctic, the Antarctic, Greenland, and on various mountain peaks.)

In North America, the Laurentide Ice Sheet, sometimes two miles thick, stretched from around New York City west along the line of the Ohio and Missouri Rivers and out to the Rocky Mountains. In Eurasia, the ice sheet covered Scandinavia and most of the British Isles, France and Germany down to the Alps, and then east through Central Europe and Russia and Siberia to the Bering Straits. In the Southern Hemisphere, ice covered not only the Antarctic but the southern Andes in Chile and Argentina and also most of New Zealand. In those days, ice covered all higher mountains throughout the world.

Four times in the Glacial Epoch, the glaciers of North America and Europe advanced, and four times they receded. Why did they recede? A silly question gets a silly answer: "to get more rocks."

Earliest to recede was the Nebraskan Glacier (and its Alpine counterpart, the Gunz), ending one million years ago. The Nebraskan Glacier's withdrawal was followed by the Aftonian interglacial period (Alpine: Gunz-Mindel). There followed the Kansan and Illinoisan glacial periods (Alpine: Mindel-Riss), followed by their interglacial periods, Yarmouth (Alpine: Mindel-Riss) and Sangamon (Alpine: Riss-Würm). These first three glaciers ended about 70,000 years ago.

They were succeeded by the Wisconsin Glacier, which started about 70,000 years ago and ended about 10,000 years ago (Alpine: Würm).

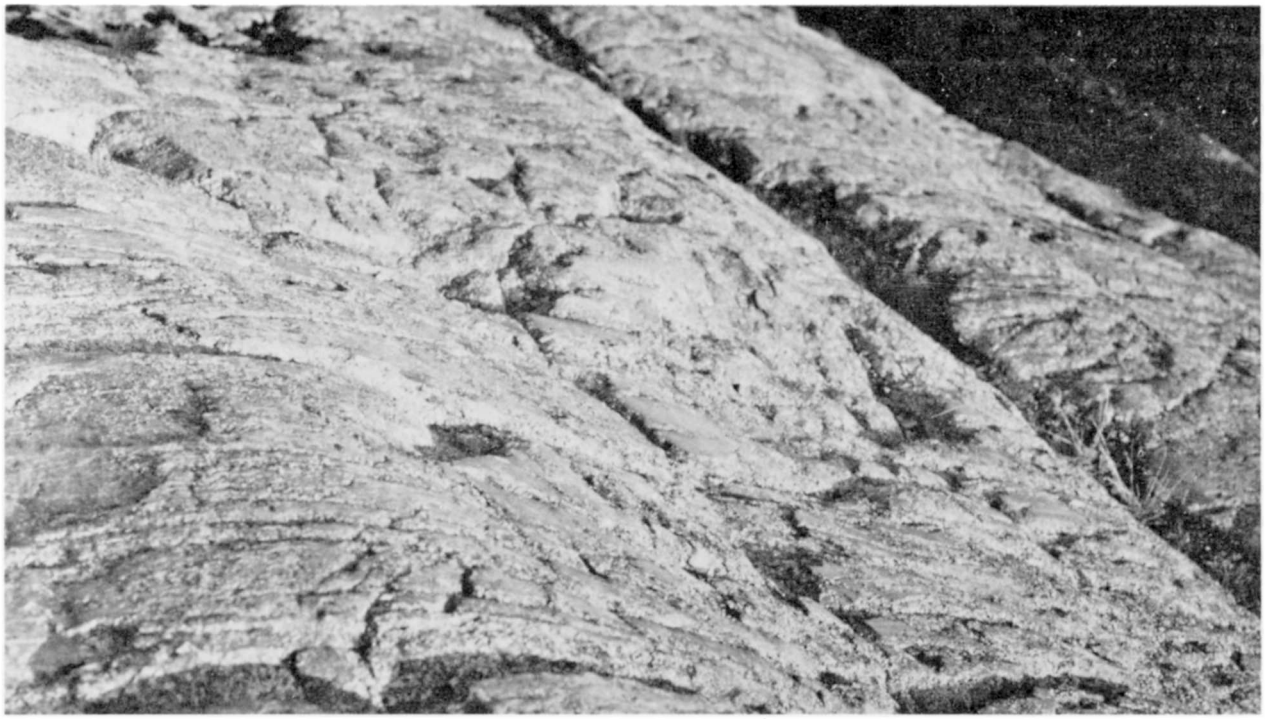
Modern carbon radioactivity tests of the buried forest at Two Creeks in Manitowoc County show that it was buried under the advancing tongue of ice only some 11,850 years ago.

How a Glacier Moves

The outermost edge of a glacier is unstable. It advances when there is a push from behind. That push may be caused by great thickness and pressure or by a favorable slope. A glacier moves back if the climate is warm enough to thaw the edges faster than they are pushed forward by the

Alpine Glacier in Olympic Park, Washington





Glacier scratched (striated) bedrock in central Wisconsin

continuous pressure from behind. For example, in Wisconsin the higher, more resistant, Niagara limestone of the Door Peninsula impeded the southward push of the ice, whereas the more favorable slope of the Lake Michigan Basin and the Green Bay lowland permitted exceptional advances by lobes of ice.

An advancing glacier is an irresistible force. It pries up bedrock, freezes onto anything loose, and, using boulders and pebbles as tools, it scratches and scours the surface over which it passes. A glacier polishes rock surfaces with fine clay and sand as it grinds its way along. In contrast to what happens on mountains—where glaciers are confined to valleys, and the deep cutting into the sides of the mountains enhances the ruggedness of the landscape—continental glaciers, blanketing thousands of square miles, have a leveling effect on the topography. Material dropped by the glacier fills in low spots, while glacial erosion scrapes and polishes hilltops. Elongated ridges, called end moraines, define the former limits of the ice margin.

The state of Wisconsin was shaped by four major lobes of the Wisconsin Glacier (Lake Michigan, Green Bay, Chippewa River and Lake Superior) and one minor lobe (Wisconsin River Valley). The Kettle Moraine was formed between the Lake Michigan and Green Bay lobes.

What the Glacier Left

You can trace the Wisconsin Glacier today, 10,000 years later, by observing what the glacier left.

The Wisconsin Glacier did some things *directly*, as when it formed the *moraines* and the *drumlins*, ground the boulders and gouged the rocks, dug out the lakes and marshes, and deposited the pitted outwash plains. Erratic boulders, dragged hundreds of miles by the glacier, are common in Waushara and Portage counties.

Moraines are dumps that were formed when a melting glacier dropped the debris it was carrying. Moraines are classified as "terminal," "end," and "ground." Where the Ice Age Trail crosses a terminal moraine, the hiker is traversing the outer region of the glacier's penetration into the area. This ridge of glacial debris outlines the terminus of the glacier. The southeastern end of Devil's Lake gap is an example. As the hiker continues inside the terminal moraine, he or she encounters "end" moraine, odd-shaped, non-flat hills, with forest or pasture fashioned by the stops and starts of a retreating glacier. Between the various "end" stops is "ground" mo-

raine, usually given over to homesites when near cities. End and ground moraine are made of debris or "drift." Interlobate moraines are formed by two ice lobes, such as the Lake Michigan and Green Bay lobes in southeastern Wisconsin.

On ground moraine, one finds *drumlins*. Drumlins are streamlined, oval hills that were molded under the weight of the ice; they also indicate the direction of a glacier. A field of some 1,400 drumlins lies in the Milwaukee-Madison-Campbellsport triangle. Great numbers of drumlins have been masked or altered by homesite and highway construction.

Nunateks are bedrock hills that are so tough they penetrated the top of the glacier. Examples occur west of Neillsville, Clark County, on Wisconsin Highway 10.

Where river valleys—such as the Wisconsin, Mississippi, and Ohio—were overwhelmed by ice sheets, the rivers were forced into new channels. Smaller drainage systems that were completely covered by glacial ice were commonly obliterated. Glacial deposits remaining after disappearance of the ice were usually poorly drained, and made the bogs, swamps, and lakes typical of Wisconsin.

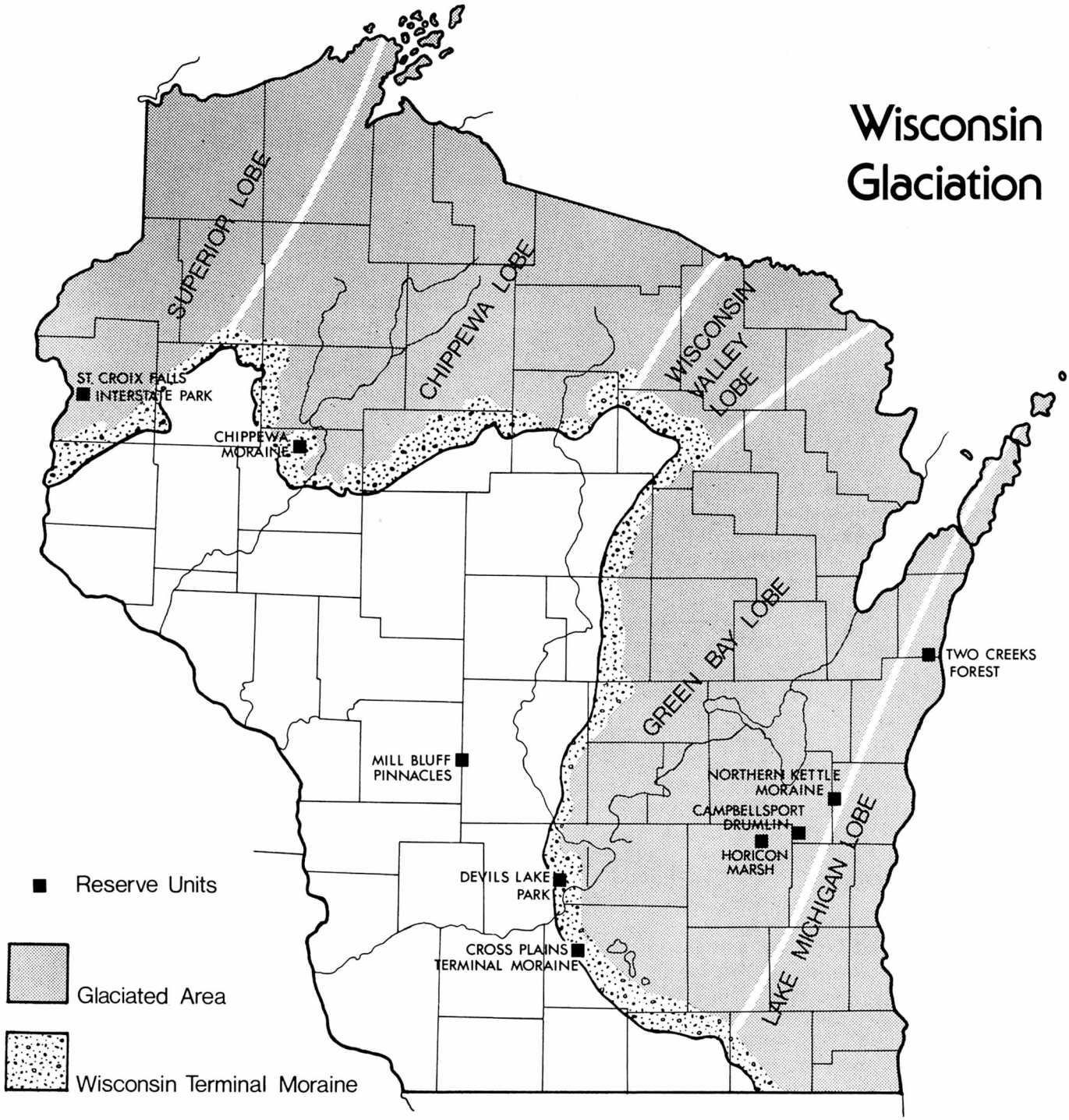
So much for what the Wisconsin Glacier did *directly*.

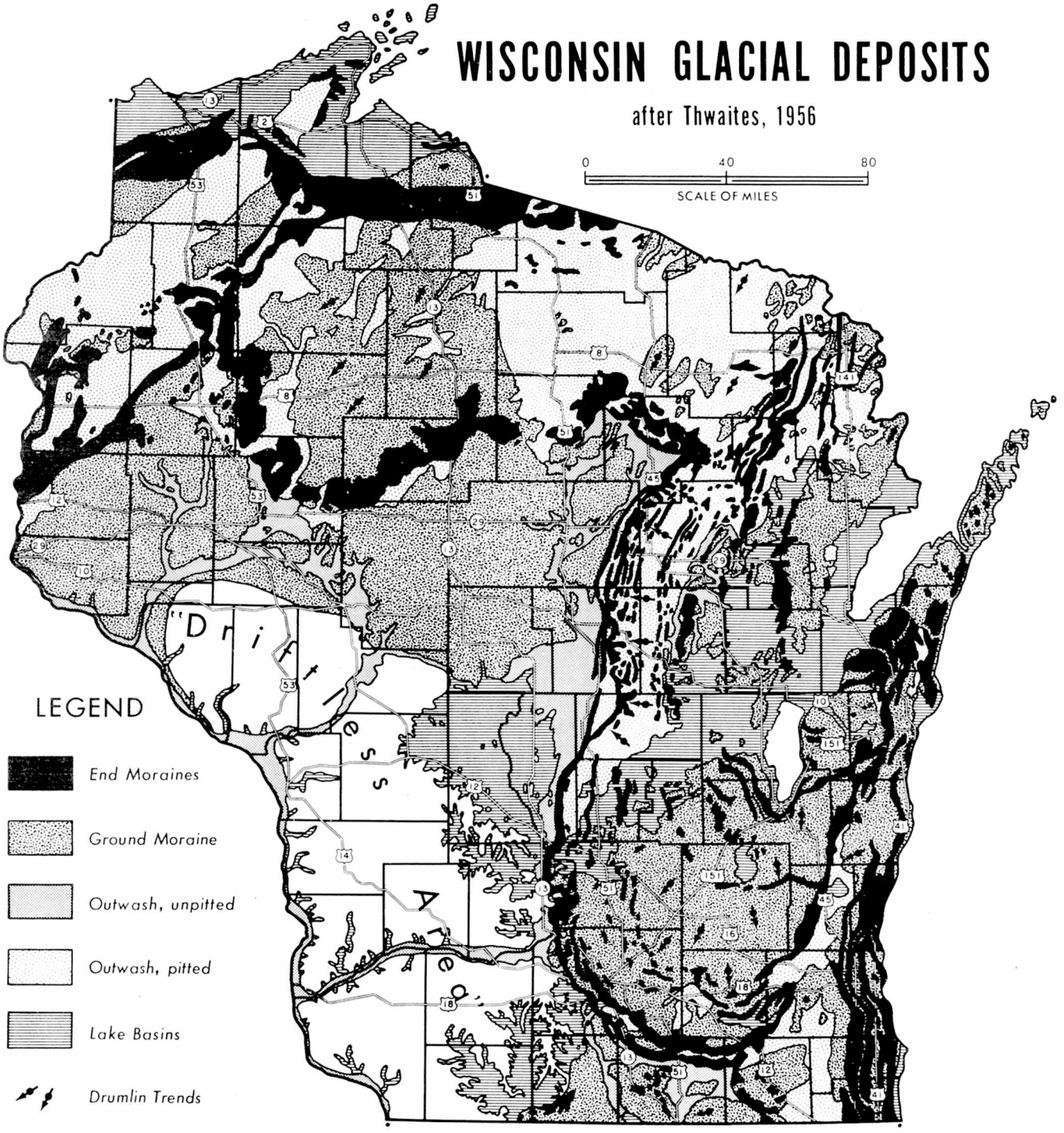
Other formations came about indirectly, from the *movement of water* through the glacial bodies. These include the kames, eskers, and kettle holes of the Northern Kettle Moraine State Forest; the rocky buttes of Mill Bluff State Park; and the deep potholes, such as the "cisterns of the gods," at Interstate State Park at St. Croix Falls.

Kames are round hills, often perfectly cone-shaped, caused by holes in glaciers through which debris carrying water swirled, leaving an hourglass-bottom deposit on the land's uneven surface. Huge round kames, such as Dundee Mountain, in the Northern Kettle Moraine State Forest, always fascinate hikers. And irregular kames such as Holy Hill near Hartford bear testimony to the staggering dimension of the ice-fronts that created them.

Large erratic on the Trail in northern Wisconsin




Wisconsin Glaciation
SUPERIOR LOBE
CHIPPEWA LOBE
WISCONSIN VALLEY LOBE
GREEN BAY LOBE
LAKE MICHIGAN LOBE
ST. CROIX FALLS INTERSTATE PARK
CHIPPEWA MORAINE
TWO CREEKS FOREST
MILL BLUFF PINNACLES
NORTHERN KETTLE MORAINE
CAMPBELLSPORT DRUMLIN
HORICON MARSH
DEVILS LAKE PARK
CROSS PLAINS TERMINAL MORAINE
Reserve Units
Glaciated Area
Wisconsin Terminal Moraine



University of Wisconsin

Wisconsin Geological and Natural History Survey

George F. Hanson, Director and State Geologist



Drumlins left by the glacier in Canada.

So large was the Wisconsin Glacier that entire rivers developed within it, leaving surface deposits called *eskers*. These sinuous ridges can be up to 100 miles long. A famous one is Parnell Esker at Dundee in Fond du Lac County. Their fine gravel, while discouraging crops, is all too well suited for homestead fill. Both kames and eskers have suffered at the hands of diggers and developers.

Kettles are surface depressions formed by the melting of buried ice chunks. They are described by John Muir, Wisconsin's great naturalist:

> These so-called kettles were formed by the melting of large detached blocks of ice that had been buried in moraine material thousands of years ago when the ice sheet that covered all this region was receding. As the buried ice melted, of course, the moraine material above and about it fell in, forming hopper-shaped hollows, while the grass growing on their sides and around them prevented the rain and wind from filling them up. The one that we performed in was perhaps seventy or eighty feet wide and twenty or thirty feet deep.
>
> John Muir, *The Story of My Boyhood and Youth* (1913), p. 80.

Where the Glacier Missed

A peculiar feature of the Wisconsin Glacier is the driftless area, an island comprising roughly the southwestern one-quarter of the state. The glaciers—certainly the most recent Illinois and Wisconsin glaciers—never invaded this area. At least, no erratic boulders of the sort that would be brought into the area by a glacier have been discovered. No glacial till covers its surface. No glacier-carved lakes dot its face.

The driftless area contains the sandstone pinnacles and mesas of the Mill Bluff Unit, limestone caverns, and natural rock bridges. A glacier surely would have obliterated them.

Blue Mound State and County Parks athwart the Dane-Iowa County Lines are good places to observe the driftless area.

In no other area of the glacial world is there such a gap. There seems to be no definitive explanation of the driftless phenomenon. Most plausible is that the great Wisconsin Glacier lost its force after battling the depths of Lake Superior and the heights of the Laurentian Shield in northern Wisconsin.

Explainable or not, one can observe what happened where the later glaciers never existed in the ruggedly eroded coulees of southwestern Wisconsin, and in the pre-glacial formations at the Cross Plains, the Mill Bluff, and the Devil's Lake Units of the Ice Age National Scientific Reserve.

How the Glacier Affected Us

The Wisconsin Glacier had a profound effect on humans. During this most recent glacial period, the Bronze Age and Iron Age cultures evolved. Also during this Epoch, Wisconsin's mastodon* and saber-tooth tiger became extinct.

*A mastodon skeleton nine feet long, found in a Wisconsin River deposit near Boaz, Richland County, is on display at the Geology Museum, University of Wisconsin-Madison.

It was the Wisconsin Glacier that deposited the fertile soil upon which Wisconsin's settlers logged their trees and grew their crops. In the north, glacially pulverized granite bedrock was hospitable to pine trees; in central Wisconsin, ground sandstone welcomed potatoes; in the southwest, ground limestone made loam well-suited to grains and hardwoods. After the glaciers receded, dust storms brought loess, a fine silt, from the Mississippi River, which further enriched the soil.

The water-courses gouged by the Wisconsin Glacier, particularly the Fox and Wisconsin Rivers, provided a route for the missionaries and traders, a floating surface for the log rafts from the forests, and more recently water for power and for the water-hungry paper industry. The Wisconsin Glacier's deposits of sand and gravel have made the concrete and hardtop for our highways, our bridges, and our buildings. And its clay provides the bricks for our homes. But for our iron, our copper, our lead and zinc, and our Lannon limestone, we have to thank the pre-glacial formations.

Parnell Esker—Created by a glacial stream.



During the European version (Würm) of the Wisconsin Epoch some 30,000 years ago, anthropologists say the first modern human arose—the Cro-Magnon from the Dordogne in Central France. The Cro-Magnon was a strapping, brainy six-footer, a good hunter, clothing-fashioner, fire-user, and cave-painter.

When the Würm and the Wisconsin glaciers thawed 10,000 years ago, some of these Cro-Magnons must have followed their animal friends of their cave paintings to cooler lands—the reindeer herds to Lapland, the bison to Poland, the mammoths to Siberia. From Siberia, some of these early Europeans may have crossed from the Old World to the New via what was then the dry land of the Bering Straits.

A recent theory contests this idea that the first Americans could only have arrived by way of Siberia. Noting that the red-oxide paint used in the prehistoric cave paintings of southwest France appears also across the Atlantic in Maine, Labrador, and Newfoundland, the theory suggests that emigration across the Atlantic may have occurred as early as 9,000 years ago.

The oldest human site in Wisconsin, and indeed in the Upper Mississippi Valley, is at Natural Bridge State Park near Leland, Sauk County. Now fortunately preserved, the sandstone bridge is 35 feet high over a rock shelter. It was carved by weathering and erosion shortly before humans appeared some 8,000 years ago. Archaeological digs have disclosed evidence of humans—firebeds, pits, and split deer bones.

Will the Glacier Return?

We are not really sure whether the great Ice Age is over.

The only real difference between the Pleistocene Epoch and the present, geologically speaking, is that the climate has grown warmer, and the great ice sheets have disappeared from all the continents except Antarctica. But on that ice-bound continent, as on the island of Greenland, there is no basis for saying that the Pleistocene Epoch is over.

In the Pleistocene Age itself, we find evidence that the glaciers gave way to warming trends four times, dividing the Ice Age into its four major stages, each marked by the spread of glacial conditions into temperate lands, and each followed by a return to climate conditions like the present, or even warmer.

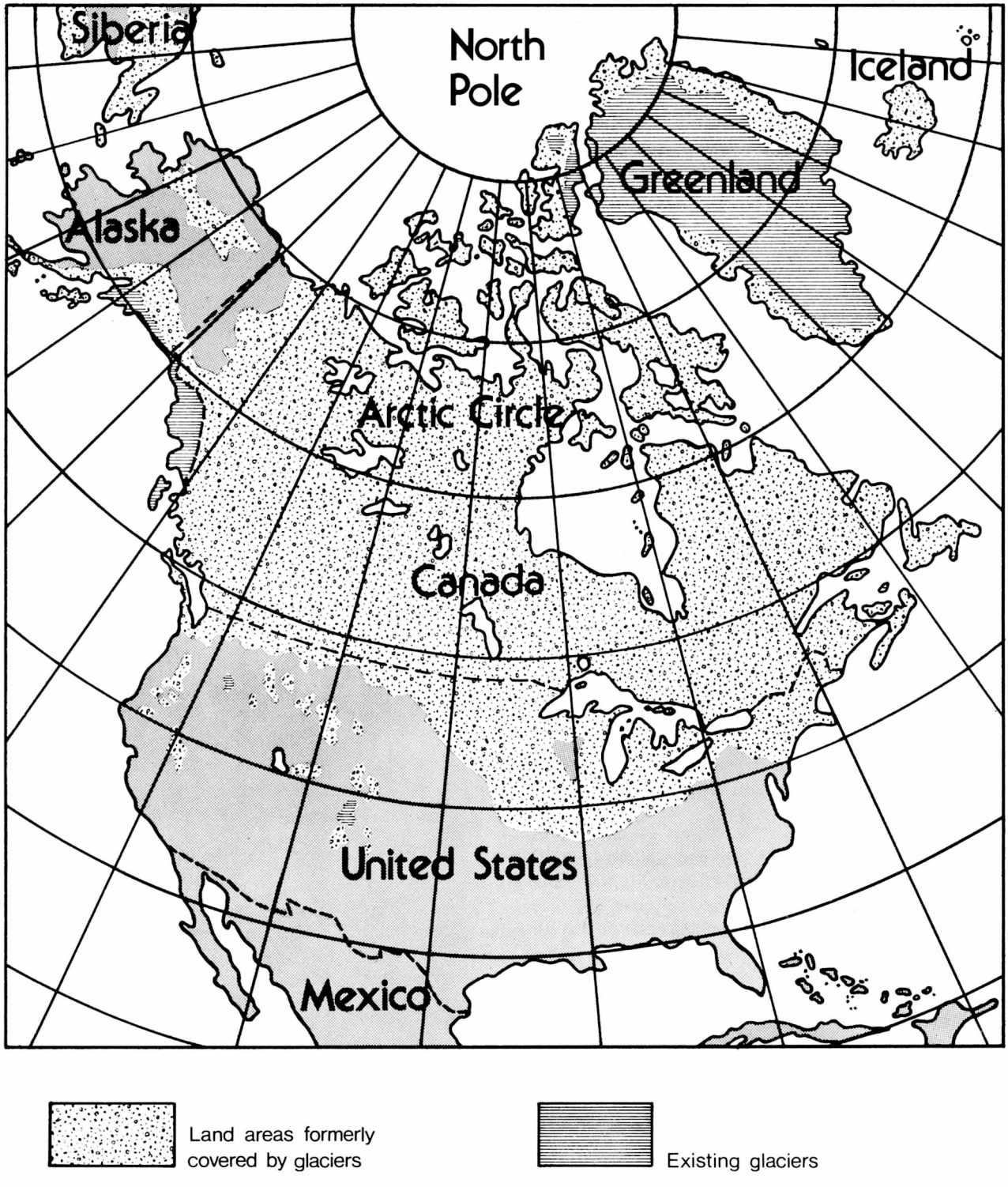
Ever since the Wisconsin Epoch ended some 10,000 years ago, there have been blips on the glacial radar screen. After a long period of warm-up and glacial retreat, things froze up a bit around the birth of Christ. But a millennium later the climate grew milder again, as the Viking settlers in Greenland found. The last 500 years have grown colder—perhaps a "Little Ice Age."

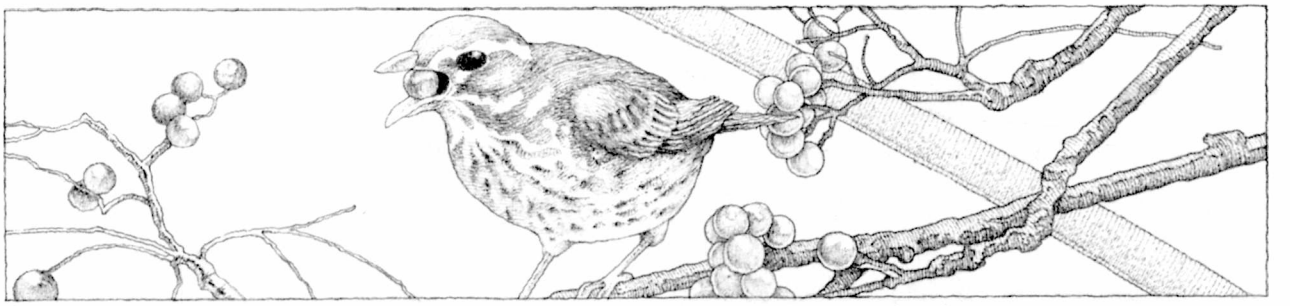
Wisconsin has emerged from the Ice Age, but there is ample evidence to show that most of it lay under a thick cover of glacial ice for many thousands of years. The time since the ice disappeared is much shorter than the time Wisconsin was in deep freeze.

Who is to say that climate, spurred by humankind's mishandling of the planet, may not change drastically once again? If we are mad enough to wage a nuclear war, the dust and smoke from a hundred new Hiroshimas could block the sun, ravage our food supply, and destroy our ports by freezing our off-shore coastal waters, thus creating a new Ice Age.

Or just the opposite could occur. Global warming, caused by the greenhouse effect of our carbon dioxide discharges through burning fossil fuels and clear-cutting the Amazon forests, could melt the polar ice-caps and drown the cities of the coast.

Faced with these scary prospects, we must mend our ways. Meanwhile, let us enjoy our allotted interval of geologic time.


Siberia
North Pole
Iceland
Greenland
Alaska
Arctic Circle
Canada
United States
Mexico
Land areas formerly covered by glaciers
Existing glaciers



BIRDS, BEES, BEASTS, TREES, BUTTERFLIES, BUGS, AND BOULDERS

The hiker and biker can be grateful to the Wisconsin legislature for Chapter 121, Section 1, of Wisconsin Laws, 1876, which directed Chief Geologist T. C. Chamberlain to pull together in one book "the leading facts and principles relating to the material resources of the State...suited to the needs of the schools of the State, and the masses of intelligent people who are not familiar with the principles of geology."

Chamberlain obliged with his 1882 report to Governor Jeremiah M. Rusk on Wisconsin's geological history, its minerals, rocks, fossils, plants, fungi, butterflies, bugs, turtles, snakes, frogs, fishes, birds, and mammals.

Owen Gromme, then curator of ornithology at the Milwaukee Public Museum, published his *Birds of Wisconsin* in 1970, a classic which all should have at hand. The book contains Owen Gromme's superb wildlife paintings.

Dr. Anne LaBastille, writer of the fine August, 1977, article in *National Geographic* on Wisconsin's Ice Age, describes her meeting with Mr. Gromme:

"I may not be the best wildlife painter," Mr. Gromme remarked as he led me into his spacious studio, "but I think I'm the oldest." At 81, he still produces oils and watercolors at a brisk pace. At least 15 canvases stood on easels in varying stages of completion.

"Most of my paintings show habitat due to glaciation," he said cheerfully. "The glacier was responsible for our scenery, the wildlife, and the economy. If you want to get right down to basics, everything in Wisconsin is tied up with the 'big gouge.' "

Books on Ice Age geology are *Geology of Wisconsin and Upper Michigan,* by Rachel Krebs Paull and Richard A. Paull; *Ice Age Lost,* by Gwen Schultz; *Wisconsin Through 5 Billion Years of Change,* by Byron Crowns; *Pleistocene Geology of Portage County, Wisconsin,* by Leo Clayton; *Geology of the Ice Age National Scientific Reserve, Wisconsin,* by R. F. Black; and the *Quaternary Geology of Southeastern Wisconsin,* by W. C. Alden.

Here is a once-over-lightly of the Ice Age's natural history.

Rocks

Igneous rocks are formed by the "fires" in the earth. You can see granite, an igneous rock, quarried near Montello. It is the bedrock of the Laurentian Shield, found particularly along the Marathon-Langlade-Lincoln counties portions of the Trail.

Sedimentary rocks are formed as the granite and other bedrock weather by physical and chemical erosion. Shale is compacted from clay,



Farm fence of small erratics

and sandstone from sand. Limestone is formed from the chemical precipitation of minerals in water and from the accumulation of shells.

Shale is visible in the gravel pits of western Waukesha County; sandstone in Rock, Green, and Dane counties; Niagara limestone throughout eastern Wisconsin from the Door County peninsula to the Illinois border, with its escarpments on the east end of Lake Winnebago, the Horicon Marsh, and through Waukesha County.

Metamorphic rock is an igneous or sedimentary rock which was subjected to enough heat, or pressure from other rocks, so that it changed into a new thing. The quartzite which covers the west bluff of Devil's Lake is a metamorphic rock produced from an earlier sandstone. Other examples of quartzite are in the pipestone region of the Blue Hills of Barron County.

Trees and Flowers

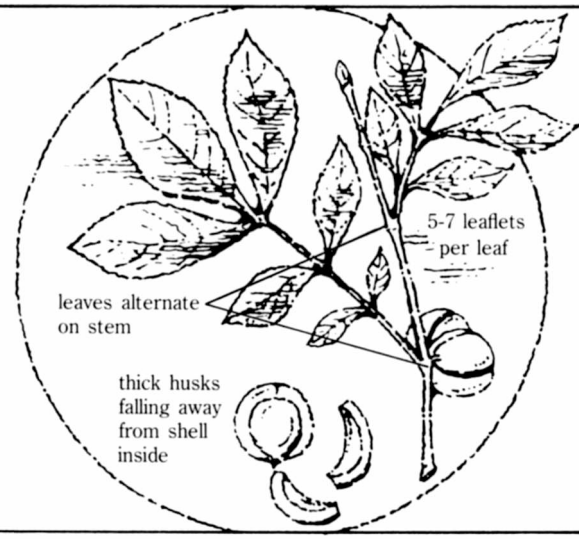
The Ice Age Trail passes through a variety of plant communities in the state.

Traversing northern conifer-hardwood forest, the northeastern portion of the Trail is lined by beech, hemlock, maple, and birch. Majestic groves of white pine are in Point Beach State Park north of Two Rivers. White pine is also found in combination with deciduous trees in the northwoods of Langlade, Lincoln, and Taylor Counties.

The southeastern stretch of the Trail winds its way through southern mesic (moderately wet) forest, swampy woods, and wet meadows. Oak savannas cover much of the area through which the southern portion of the Trail crosses. On open sites one finds bur and white oak growing among prairie grasses and wildflowers. Remnants of the original prairie grasses are found along the Whitewater-New Glarus railroad rights-of-way.

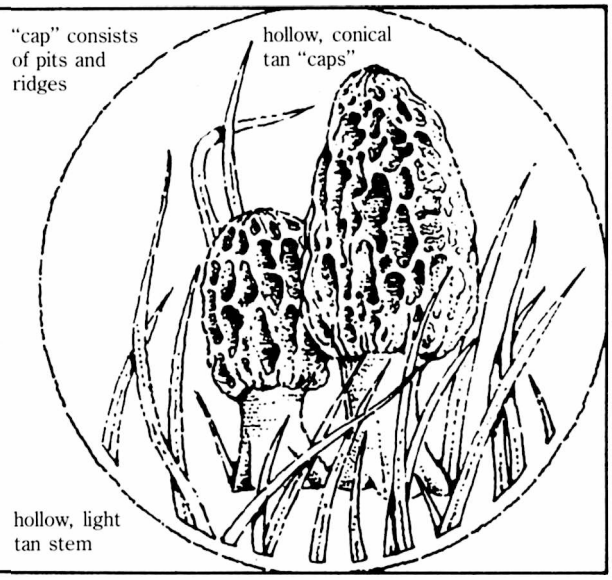
Hickory - September and October

Of the several kinds of hickories that grow along the Ice Age Trail, the best tasting by far are the nuts of the shag-bark hickory. This tree's shaggy bark and thick husks are easy to recognize. Nuts begin to rattle to the ground after a few September frosts and, though sometimes hard to extricate from their shells, are worth the effort of gathering and cracking.



Morel Mushroom - May

In mid- to late May along many parts of the trail an eagle-eyed hiker may spot morel mushrooms. Their ease of identification and delicious taste make these fungi favorites of outdoor gourmets. It's a rare morel hunter who will pass on the locations of his/her treasures, but the beginner can concentrate his efforts in areas of dying elms, ash trees and in old orchards. Morels may be found elsewhere, but often are most abundant at the bases of these three kinds of trees. Look for the following identifying characteristics:



All along the route in the southern part of the state one encounters shagbark hickory, American elm (such as has not yet been seized by Dutch Elm blight), black cherry, basswood, white and green ash, eastern red cedar, willow, black walnut, honey locust, mulberry, and crabapple.

The sand counties of central Wisconsin are characterized by scrub oak and jack pine. From the sand counties, the Trail once again enters the northern conifer-hardwood forest. Along this north central and northwestern segment of the route one sees forests of hemlock, red and sugar maple, white and black spruce, yellow and paper birch, white cedar, and northern red oak.

Many wildflowers are found along the way. Some of the spring flowers a hiker can expect to see are pasque flower, buttercup, violet, mayapple, wild geranium, columbine, asparagus, bellflower, and indian pipe. In summer and autumn milkweed, tiger lily, wild sunflower, black-eyed susan, coneflower, ox-eye daisy, turtlehead, hawkweed, mullein, wild aster, and goldenrod abound along the Trail. Shrubs most frequently encountered are hawthorn, chokecherry, currant, rose, honeysuckle, staghorn sumac, and alder. Poison ivy and poison sumac keep you on the Trail.

Fungi, lichens, and mosses, common along the whole route, exhibit patterns of distribution related to the different forest types. Edible mushrooms are particularly prolific in the Northern and Southern Kettle Moraine State Forests. Spring morels and the sulphur polypores and coral mushrooms of fall are the only safe ones suggested for the non-expert.

Mammals

Among the large mammals, deer and black bear are surprisingly common. Jim Staudacher in his 1979 1,000-mile hike ran into at least four black bears, to the mutual surprise of all. Beaver are hard at work all over the Chippewa wilderness unit of the Ice Age Reserve. Muskrat are numerous on the Horicon and Sheboygan Marshes. A dead tree anywhere along the route is likely to yield a raccoon or an opossum. Cottontail rabbits, squirrels, grey and red foxes, woodchucks, skunks, and badgers are all frequently seen around glacial rock piles.

Amphibians, Reptiles, and Fish

Harmless garter snakes are frequent visitors along the Trail. Timber rattlesnakes can still be encountered in some of the rock formations of Devil's Lake. Great places to study fish and pond life are John Muir's Fountain Lake in Marquette County, and Butler Lake in the Northern Kettle Moraine State Forest.

Birds

The Trail parallels several important bird areas. You will see wild turkey, ring-necked pheasants, and gray partridge in eastern Wisconsin; quail in western Wisconsin; mallards,

canvasback, redheads, scaup, teal, snipe, woodcock, coots, Canada and snow geese at Sheboygan and Horicon Marshes; sandhill cranes along the Fox River; and hawks riding warm air thermals over the Niagara escarpment in eastern Wisconsin. Cliffs and banks along the way afford a chance to observe swallows. Dead trees attract flickers, and pileated, red-headed, red-bellied, hairy, and downy woodpeckers. In the forest are the phoebe, the pewee, and the fly-catchers. Up above, the kingbirds lambast the crows. In winter there are chickadees, nuthatches, juncos, cardinals, and bluejays. In meadows you will see the eastern bluebird, the scarlet tanager, the northern oriole, and the indigo bunting. Spring and fall are great times to sit in the blossoming undergrowth to see how many warblers you can log. Whippoorwills, nighthawks, and owls will be with you at night, even as they were with young John Muir.

Listen to Dale E. Katsma, Department of Natural Resources wildlife manager, tell how to get to know the birds at a spring dawning in the Kettle Moraine:

"At approximately one-mile intervals, pull your car safely to the side of the road and walk about 15 to 20 feet from the car, and quietly listen and watch for five minutes. You may hear a woodcock peenting, a tom turkey gobbling, ruffed grouse drumming, a rufous-sided towhee singing 'drink you tea,' mourning doves cooing, snipes winnowing, a pheasant crowing, a wood duck whistling. You'll probably see a few white-tailed deer crossing the road; a variety of songbirds flitting through the bushes; perhaps a broad-winged hawk will flush from a nearby tree."

Invertebrate Animals

Literally thousands of different species of insects and other invertebrate animals live along the Trail. In the woodlands you can observe many camouflage experts. There are various spiders, walkingsticks and caterpillars that look like twigs, and moths and butterflies whose wings resemble dead leaves or bark, like the Question Mark butterfly. There are also many kinds of beetles, ants, millipedes, and related

Beaver Dam





Point Beach State Forest—Horsetail

forms that aid in the decomposition of fallen trees. At streams you may find crayfish, fingernail clams, mayflies, giant water bugs, whirligig beetles, brightly colored dragonflies, and damselflies. Dragonflies rest with their wings spread apart in a horizontal position, while damselflies keep their wings folded together and pointed back. In the meadows and prairies there is a great diversity of invertebrate animals, from the orb-weaving spiders with their intricate webs, to the leafhoppers and their immatures known as spittlebugs, to the monarch butterfly whose striped caterpillar resides on milkweeds, to the bumblebees and wasps that construct large papery nests. In summer the songs of crickets, cicadas, and katydids fill the air.

Some Natural Areas Along the Way

Wisconsin has more than 200 Natural Areas—natural spots with native plant and animal communities, or unique geological or archaeological features. Many of these areas are to be found in the nine units of the Ice Age National Scientific Reserve. Others, encountered along the Ice Age Trail, include the following:

WILDERNESS RIDGE, MANITOWOC COUNTY

This eight-acre area lies within Point Beach State Forest, south of the east-west road leading to headquarters, the lighthouse, and campgrounds.

It consists of two perpendicular transects (marked by posts), each 66 feet wide, and located on and across abandoned beach lines of Lake Michigan. The north-south transect follows a ridge wooded with white pine, hemlock, and spring plants and ferns. The area was purchased in 1947 to prevent imminent logging, and was dedicated to Haskell Noyes, the Milwaukee conservationist, in 1956.

MILWAUKEE RIVER AND SWAMP, FOND DU LAC COUNTY

Also within the Northern Kettle Moraine State Forest, this 230-acre area is one-fourth mile south of Mauthe Lake. The best access is by boat on the Milwaukee River, or the foot trail southeast of Mauthe Lake.

It includes a three-quarter mile stretch of the Milwaukee River, with a succession of lowland vegetation types to the east of the river. Both swamp conifer (white cedar, black spruce, and tamarack) and lowland hardwood forest are

Milwaukee River—Near its source



there. Also within this scientific area are a large spring run 1,000 feet long, a small bog lake, and a well-developed shrub zone along the river.

SPRING LAKE, FOND DU LAC COUNTY

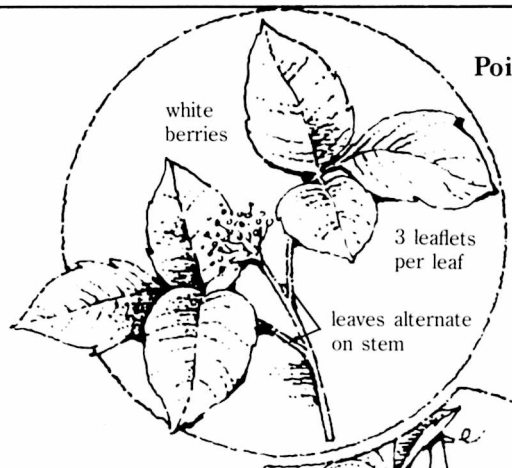
Still within the Northern Kettle Moraine State Forest, four miles east of Campbellsport and five miles north of Kewaskum, is this 47-acre area. It includes a 10-acre, alkaline bog lake that is very clear and has a marl bottom. Many plant species typically found in acid bogs and calcareous fens occur together on the surrounding bog mat. Although the lake has a maximum depth of only two feet, it has a diverse fish population of northern pike, large-mouth bass, perch, bullheads, and sunfish. East of the lake, the surrounding bog mat gives way to a tamarack forest, beyond which is a swamp forest of elm, yellow birch, red maple, alder, willow, and tamarack. Amphibians include green, leopard, chorus, and bull frogs; toads; midland, painted, and snapping turtles; and water and garter snakes. But beware of the poison sumac in the area.

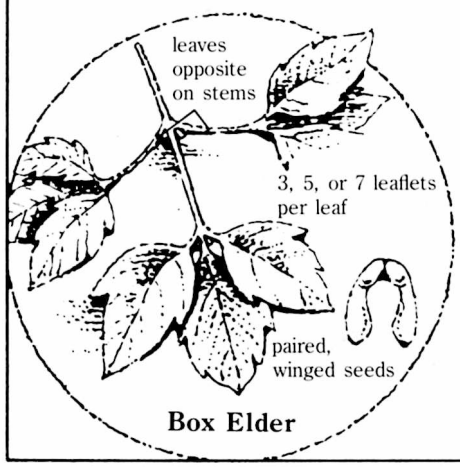
KEWASKUM WOODS, WASHINGTON COUNTY

This 50-acre area lies one mile east of Kewaskum on Wisconsin Highway 28, then south one mile on dead-end town road, walk west into woods, the Northern Kettle Moraine State Forest. The area is just east of the Milwaukee River on undulating morainal topography.

Over 125 plant species have been reported in this southern mesic woods. Old-growth timber is common in the northernmost of the two tracts making up the scientific area (separated by an open field and pine plantation), with many trees

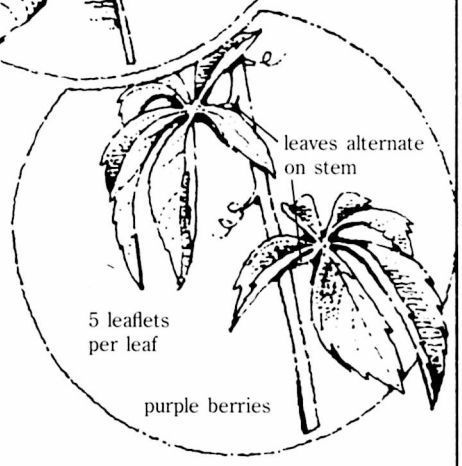
Poison ivy, maligned though it may be, is not really a threat to the enjoyment of the Trail. Indeed, when in the autumn it turns a flaming scarlet, it is a delight to see—from a distance. To learn to recognize poison ivy one must first know where to expect it to grow. It commonly is found along fencerows, roadsides, sparse thickets and at the edges of woods. It's seldom found deep in forests or in the middle of open fields. Study the simple drawings below to learn how to distinguish poison ivy from other similar plants.





Leaflets three,
Let it be.
Berries white,
Take flight.

The above verse is a good one to learn because, whether growing as a bush, a low herb or as a vine, poison ivy always has three leaflets and from summer into winter has white berries. The best cure is prevention.



18 inches or more in diameter. Kettle holes in the woods contain ephemeral ponds. No salvage timber cutting is allowed.

OTTAWA LAKE FEN, WAUKESHA COUNTY

This 50-acre area lies on the northern side of Ottawa Lake, four mile north of Eagle on Wisconsin Highway 67, in the Southern Kettle Moraine State Forest.

Ottawa Lake consists of two depressions connected by a deep marsh and shallow marl flats. The smaller, northern lake (3.2 acres, 6 feet deep) is largely undeveloped and is supplied by numerous seepage springs, small boiling springs, and several cold inlet streams. The water flow is south into the larger lake depression, which has an extensive recreation area on its southern end. An unusually large number of wetland and aquatic plant communities surround the northern lake. These include: submergent aquatic (lake and stream), emergent aquatic (mainly cattail and hard-stemmed bulrush), southern sedge meadow, shrub-carr (dogwood, shrubby cinquefoil, willow), tamarack swamp. More extensive than any known in the state, the fen-marl flats contain unusual and rare plants such as pitcher plants in a highly alkaline situation, beaked spike rush, small bladderwort, marsh club-moss, and fringed gentian. The upland wooded area to the east consists of locust, box elder, aspen, basswood, and oak. Animal life includes clams, snails, water snakes, pickerel frogs, bull frogs, Blandings' turtle, midland painted turtle, green heron, wading birds, and waterfowl. A bird observation tower stands on the lake's northern edge. Ottawa Lake Recreation Area, at the south end of the lake, receives heavy use. An abandoned, overgrown gravel road is on the northern edge of the lake. Seepage springs on the eastern shore are fragile and susceptible to foot damage.

SCUPPERNONG PRAIRIE, WAUKESHA COUNTY

This 18.5-acre wet prairie is 1.5 miles northwest of Eagle, at the southeast corner of the junctions of Waukesha County GN and N. It lies on the east edge of the 3,000-acre Scuppernong Marsh in Southern Kettle Moraine State Forest. On a low rise in the center of the prairie are scattered young open-grown bur oaks, typical of this region in presettlement times. Several rare plant species occur in the prairie. The uncommon upland sandpiper may still be seen at times.



Marsh marigold

Periodic burning is needed to control the woody vegetation. The prairie is a source of seed for other prairies.

KETTLE MORAINE FEN AND LOW PRAIRIE, WAUKESHA COUNTY

This 250-acre fen is two miles north of Eagle on Wisconsin Highway 67, then west on deadend road to parking lot, west one-fourth mile to areas on north and south of lane. The area combines low prairie, sedge meadow, and fen. It adjoins the eastern edge of the huge Scuppernong Marsh. The many prairie and fen species, including a number considered to be threatened or endangered in the state, make this remnant a valuable research and class study area for many regional schools and Kettle Moraine Forest visitors. Periodic fire management and manual removal of invading woody vegetation are necessary to maintain the open condition.



Southern Wisconsin—Sedge meadow

The scientific area consists of two somewhat different portions. The northern segment has gently undulating topography and standing water in the low parts during the spring. The southern segment is more uniform in topography and slopes gently westward toward the Scuppernong River. The area is about one mile west of the major interlobate moraine on the east edge of what was low prairie and meadow. It was some three miles in length in presettlement times. The northern segment contains wet mesic prairie elements with fen species as well, and it grades into a sedge meadow. Willow, dogwood, and aspen have invaded locally. They will be the focus of management activities to reduce their abundance and to prevent the shading-out of the prairie plants. The southern segment is a rich, low prairie with Indian grass, big and little bluestem, vanilla grass and such forbs as rattlesnake master, blazingstar, grass-of-parnassus, wood betony, prairie dock, Ohio goldenrod, valeriana, and heart-leaved meadow parsnip. More than 90 native species of plants have been recorded in the scientific area.

EAGLE OAK OPENING, WAUKESHA COUNTY

This 90-acre area lies five miles southwest of Eagle, on the east side of Waukesha County Z, two miles south of the junction with Wisconsin Highway 59, in Southern Kettle Moraine State Forest. Originally the area was vegetated with oak savanna, but grazing and the lack of fire have allowed forest vegetation to become predominant. Periodic fire management is planned to restore savanna conditions. Four features deserve attention: (1) kettle holes, with seasonal ponds; (2) oak openings as in pre-settler days, stressing bur oaks including one 3.5-foot diameter giant, and red oak, white oak, black oak, red cedar; (3) dry prairie, wooded by hawthorne and plum; and (4) prolific pasque flowers.

GENESEE OAK OPENING AND FEN

This 52-acre (ultimately to be 110-acre) area is located in south central Waukesha County, one mile south of Genesee Depot and two miles northeast of North Prairie. It is a classic bur oak opening on the rolling topography. Many small prairies within the 20-acre savanna are dry to

dry-mesic prairies with dozens of native grasses. On the east is open, calcareous marsh, with prairie and fen species reinvading. The headwaters of clear, fast-flowing Genesee Creek are found in the area. Fire maintenance and manual brush removal are included in the management plan.

LULU LAKE FEN, WALWORTH COUNTY

This 57.5-acre area is four miles northwest of East Troy and one mile west of Lulu Lake on one of its tributary streams, three miles east of Southern Kettle Moraine State Forest. It contains an undisturbed small spring pond and seepage springs situated at the base of glacial deposits in the abruptly rolling topography of the interlobate moraine. The springs form part of the headwaters of the main tributary to Lulu Lake to the east. Along the stream, which is 6-12 feet wide and has a muck bottom, is a plant-rich zone of calcareous marsh (fen) of about 20 acres. The remainder of the tract is rolling upland, an open forest of red, white, and bur oaks, that once was used for intensive grazing.

Southeastern Wisconsin—Mount's Oak Opening



IRVIN L. YOUNG PRAIRIE, WALWORTH COUNTY

This 53-acre area lies five miles east of Whitewater, off Bluff Road, 0.5 mile south of County Line Road, just west of Southern Kettle Moraine State Forest. There are approximately 25 acres of wet-mesic (mildly moist) prairie, with 20 acres of old field reverting to prairie. A small stream and associated wetland vegetation of 10 acres are located in the northeastern section of the tract. Over 80 species of native plants have been found in a preliminary inventory of the prairie, including a number considered endangered or threatened in the state.

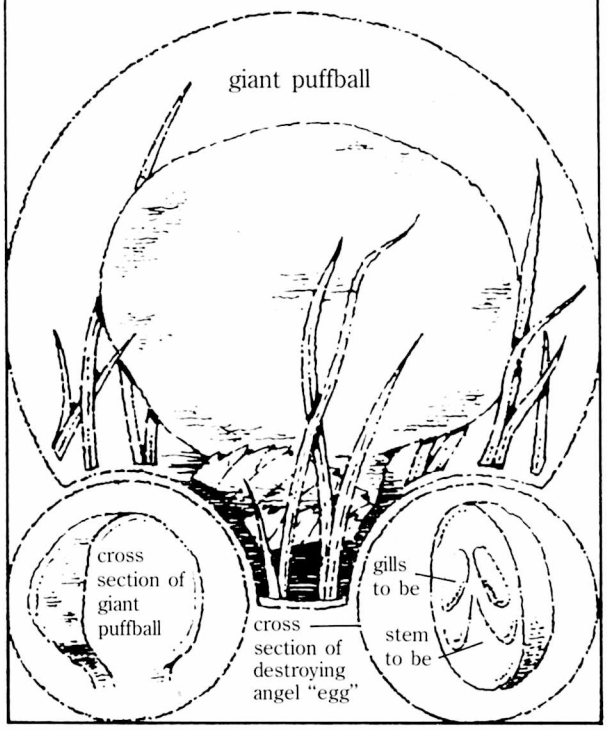
Along the northern border of the prairie, aspen and gray dogwood have invaded around several old oaks, which attest to former, more open conditions. More than 90 species of native plants have been found on the prairie, including several rare species—white camass, heart-leaved meadow parsnip, Riddel's goldenrod, small yellow and white lady's slipper. The low prairie contains elements most frequently found in wet-mesic prairies, fens, and mesic to wet prairies. Ant mounds occur within the prairie. The prairie has a slight shrub and aspen invasion problem and needs periodic fire maintenance to preserve the prairie flora.

ABRAHAM'S WOODS, GREEN COUNTY

This 40-acre old-growth mesic forest lies 2.7 miles southwest of Albany, one-fourth mile west of Wisconsin Highway 59 on the south side of Oliver Road. The forest is located on the east and north sides of a sandstone ridge, where it escaped periodic presettlement prairie fires from the west. Sugar maple, slippery elm, red oak, basswood, yellowbud hickory, hackberry, black walnut, butternut, and ironwood are found here. Farmer Ben Abraham collected maple sugar until his death in the 1950s. Dutch elm blight killed many of the elms during the 1960s. The woodland contains diverse spring flora, while the mid-summer flora is dominated by wood nettle and jewelweed. Adjacent to the south end is unprotected woodland and remnant prairie subject to grazing, but providing an ecological contrast to the ungrazed woods. It is owned by the University of Wisconsin and is used by ecology classes.

Giant Puffball - September

Looming like so many white basketballs in a meadow, giant puffballs appear with the onset of autumn rains. They seem especially likely to spring up if the field has some manure on it from grazing cattle. A smooth white to light tan exterior and a smooth and featureless white interior are the characteristics to look for. When the giant puffball matures the interior turns from white to a greenish-yellow until finally a tan powder (the spores) fills the dried out tan ball. Puffballs are edible only when white inside. A small puffball could conceivably be confused with the young or "egg" stage of the poisonous destroying angel. But by slicing the specimen in half, one is able to see the beginning of gills, stem, etc. if the specimen is a destroying angel. The interior of a young puffball is undifferentiated and white, like vanilla ice cream.



OLIVER ("SHOOTING-STAR HILL") PRAIRIE, GREEN COUNTY

This 4-acre prairie lies two miles southwest of Albany, three-fourths mile west of Highway 59, on the south side of Oliver Road. It rests on a ridge of sandstone capped with a thin layer of dolomite. Despite its small size, more than 100 species of prairie plants have been identified on the tract. Because of its steep, rocky slope and ownership pattern, this prairie remnant has escaped destruction. Green County's Muralt Prairie occupies the same ridge one-half mile to the north. The University of Wisconsin is custodian.

Hugh Iltis' account of Oliver Prairie tells it all:

If there is one plant community in Wisconsin beautiful beyond words, so lovely that it takes one's breath away, it is the prairie. This Persian carpet of flowers, this burst of color on the landscape, this waving ocean of grass has fired the imagination of generations, not least of all the pioneers, who not only appreciated its loveliness, but realized its value as the best of all farmlands. Alas, the pioneers are gone, and so is the prairie. All that is left after cow or plow are bits and pieces. Mesic Prairies have practically all disappeared into corn fields and pastures. Only an occasional cemetery corner, a railroad right-of-way, or a forgotten spot on a back forty, might yet treasure a bit of mesic prairie. Though unplowable, the dry (xeric or high lime) prairies are becoming very rare, too. The need for limestone seems to be unlimited and many of the prairies have been destroyed to remove the limestone beneath them. The highway department seems to have a compulsion for straightening roads which wind around prairie bluffs, and some of our best limestone prairies have been lost to the proposition that the only possible road between two points must be straight. So far, these considerations have outweighed any esthetic or educational values. The best of the dry prairies are now gaping pock marks on the earth, and like the gravel pit across the road, give mute testimony to what was destined for "Shooting-Star Hill."

But today, "Shooting-Star Hill" is safe! Named the "Oliver Prairie," it honors the former owners, Mr. and Mrs. Edward Oliver, who partly because of their appreciation of its flowers, agreed to sell these five acres to the Nature Conservancy for perpetual preservation. Here grow most of the species typical of dry, steep, south-facing prairies (often called "Goat Prairies" on account of their steepness, for it takes a real "goat" to scramble up such a slope!), mostly calcophiles ("lime-lovers"), plants known in Wisconsin only from such dolomite bluffs, as well as xerophytes ("drought plants"), plants that can survive the hot, dry summers of these sunbaked hills.

The geographic relations of the 100 species are varied. Several of its members, such as Grama Grasses (*Bouteloua* spp.), and Dropseed Grass (*Sporobolus heterolepis*) have had their origins in the arid southwest, where calcareous soils are the rule. Other plants, as Shooting Star (*Dodecatheon meadia*) and Cinquefoil (*Potentilla arguta*) are rather widespread in the eastern states, yet belong to mainly Rocky Mountain genera or species. Still a few others, such as the Pasque Flower (*Anemone patens*—not collected here), belong to widespread sircum-boreal species. These plants grow on dry rocky grasslands even as far as central Europe and may have invaded Wisconsin from the northwest after the ice left some 9,000 years ago. Perhaps the largest group of plants seen here are species endemic to the midwestern prairies, with rather ancient generic affinities to, and origins in, the eastern deciduous forest. The Asters, Goldenrods, and Bee-balm, the *Coreopsis*, Rosinweeds, and Compass Plants probably sat out the glacial catastrophe some 600 miles to the south or southwest, in Kansas, Oklahoma, or Missouri, and reclaimed the freshly available glaciated land some 6,000 years ago. Abraham's Woods, a mere one-half mile down the road, is worlds away in the vegetational sense, as different from the prairie as it can be. Its climax vegetation of Sugar Maples, Elms, and Basswoods, with a rich understory of spring ephemerals, has strictly southeastern deciduous forest affinities and none of its many species are found on the prairie. The Maples and Basswoods, like the Mayapple, Trillium, and Dutchman's Breeches below them, survived in the lands below the Ohio River, returning north by way of Michigan and Illinois.

Considering the divergent histories of these two bits of vegetation, worlds apart in evolution, adaptation, and ecology, we are fortunate that they are so close together geographically, for here we can compared these plant communities easily and use them in teaching our young people biology, ecology, and esthetics.

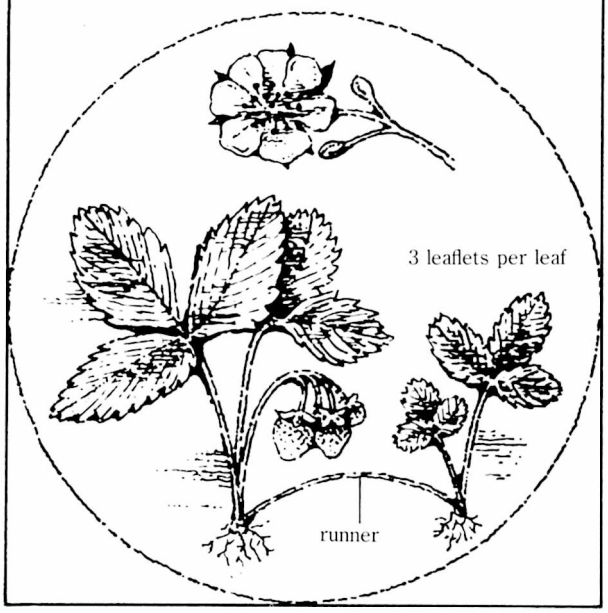
And last, but not least, through the help of many, we are fortunate to have been able to preserve this land at all. And here perhaps lies a lesson as valuable as the others that can be learned from a prairie; the lesson that the end results of two billion years of evolution, wherever they still may be left in their complex interrelationships, have value to man, both scientific and esthetic, far beyond their value in dollars. To the hundreds of people in Wisconsin who believe that man does not live by bread alone, and that

Bottomland in Rock County



Strawberry - June

Look for the wild strawberry in sunny June meadows. Though the fruit is small and not always abundant, it is most tasty—and besides, the collecting itself is as much fun as the eating! Like the cultivated strawberry, the wild species spreads by runners, flowers in May, and develops fruit in June.



man needs to preserve even the least of the living, to those who have felt the need to pledge their conservational ideas with concrete action, and thus made both of these purchases possible through their generosity, we express our sincere thanks.

MURALT BLUFF PRAIRIE, GREEN COUNTY

This 62-acre prairie lies three miles west of Albany, on the south side of Wisconsin Highway 39, 1.5 miles west of its junction with Wisconsin Highway 59. The area is a dry prairie, occupying a long, sweeping ridgetop of sandstone thinly capped with limestone. Although the tract received some grazing pressure in past years, the dry conditions have helped retain the prairie's integrity and species diversity. In addition to the outstanding spring displays of such showy plants as pasque flower and prairie violets, a number of rare prairie species still survive here in large numbers, such as the threatened Hill's thistle. Oliver Prairie lies one mile to the south. Management (such as periodic fires and brush removal) is being performed by members of the Green County Conservation League.

NEW OBSERVATORY WOODS, DANE COUNTY

This 13-acre area lies 1.5 miles northwest of Pine Bluff (seven miles west of Middleton), off the west side of Observatory Road and 500 feet north of Pine Bluff Observatory, south of the Cross Plains Ice Age Reserve Unit. The area exhibits a diagrammatic continuum, from moist red oak woods to dry forest to oak savanna and dry prairie in the northwest corner. The preserve is located just a few miles west of the Johnstown terminal moraine, in the rugged topography of the driftless area. Oak opening and prairie are managed with periodic fire; the tract is used extensively by UW ecology classes.

KOSHAWAGO SPRINGS, SAUK COUNTY

This 40-acre area lies on the southwest side of Devil's Lake in the State Park, at South Shore Road where it crosses Messenger Creek.

A small wooded valley opens onto Devil's Lake. Several springs form the headwaters of Messenger Creek. Many uncommon plant species are present along the cool rocky stream, shaded by sugar maple, red oak and yellow birch. The ancient valley was cut into the Baraboo quartzite and later partially covered with sandstone sediments. The valley is rich in breeding birds.

PINE GLEN, SAUK COUNTY

This 120-acre area is located in the southwest corner of Devil's Lake State Park, south 1.75 miles on old Highway 12 from South Shore Road, then west by foot into the glen. This deep and spectacular wooded gorge on the south flank of the Baraboo Hills has been termed by geologists as a narrow gorge incised in a broad hanging valley. Unlike many similar gorges in the region, it lacks younger sediments over the quartzite. An intermittent stream flows through the glen, which contains many large white pines, sugar maple, blue beech, yellow birch, red oak, and

basswood. Ground cover includes trailing arbutus, shin leaf, and wintergreen. Cold air drainage into the glen allows a number of northern species to exist here, such as oak fern, shining club-moss, blue-bead lily, twisted stalk, Solomon's seal, Canada mayflower, star-flower, and northern enchanters' nightshade. The tract is removed from the park's high-use areas, and is ideal for nature study and bird watching.

DEVIL'S LAKE RED OAK FOREST, SAUK COUNTY

This 122-acre area lies about three miles south of Baraboo, east of the large south shore campground within Devil's Lake State Park. It is an even-aged red oak forest (originating between 1856 and 1872 by core data) with a nearly pure understory of red maple and some white oak. North of the forest lies the quartzite boulder talus slope, rising some 400 feet to vertical cliff faces above. The forest lies on part of the terminal moraine which plugs the pre-glacial Wisconsin River gorge.

Abraham's Woods—Old-growth mesic forest



Hiking trails run through the area to the top of the bluff, and are used by thousands of park visitors. A park road bisects the oak forest near the base of the slope.

PARFREY'S GLEN, SAUK COUNTY

This historic glen lies five miles south of Baraboo on Wisconsin Highway 113, then two miles on Parfrey's Glen Road to parking lot. Its 480 acres includes a narrow, deep gorge. The tract was purchased from the Parfrey family in 1947 with funds specifically allocated for natural area preservation by the Conservation Commission.

Parfrey's Glen is a spectacular gorge deeply incised into sandstone conglomerate of the south flank of the Baraboo Hills. The narrow gorge is widely known to hikers because of its scenic beauty and to naturalists because of its rich shaded cliffs and rock exposures. A sign dedicated Parfrey's Glen to Professor Norman C. Fassett, a "student and teacher of our native flora; while chairman of the Natural Areas Committee, 1945-1950, he selected Parfrey's Glen as the first scientific area in Wisconsin." The exposed Cambrian strata provide excellent opportunities for geological interpretation. It is assumed that the gorge was cut by glacial meltwaters because the existing cold-water stream is small and choked with fallen rocks. The gorge walls reveal large conglomerate fragments up to four feet in diameter, alternating with sandstone layers as well as pebble-sized conglomerates of well-rounded fragments. These unusual sedimentation patterns record alternating violent and normal sedimentation in an area about a mile from the Cambrian shore. Research on the aquatic fauna in the stream has shown it to be unique in terms of caddis flies. The gorge walls, moist from seepage, cool, and shaded, harbor a northern flora including white pine, yellow birch, mountain maple, and rare cliff plants. Uplands east and west of the gorge are wooded with a southern dry-mesic forest of oaks, red and sugar maple, basswood, ironwood, and hickory.

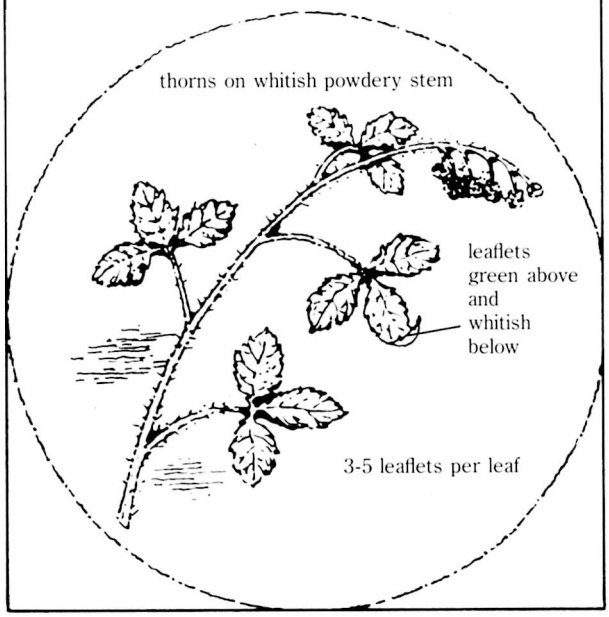
A series of grist and saw mills and a still were constructed in the glen beginning in 1846. Recreational use steadily increased in the last 100 years. Severe erosion, bank trampling, and littering results from overuse. Trails have been covered with quartzite chips. The area receives heavy educational use from midwestern schools.

GIBRALTAR ROCK, COLUMBIA COUNTY

This 35-acre landmark bluff lies three miles northwest of Lodi, one mile west of the junction of Wisconsin Highway 113 and Columbia County V, on the south side of V. It rises some 400 feet above the Wisconsin River to the north. It is capped with layers of dolomite and sandstone which are outliers from the escarpments to the east and south. The area contains a diversity of plant communities, from sheer open cliffs to oak-basswood hardwoods to open prairie and cedar glades on the steep south-facing slopes. Plant species include blue-stem grass, Indian grass, side oats grama, blue-eyed grass, birdsfoot violet, castilleja, puccoon, pasque flower, leadplant, prairie smoke, and geum arguta. Glacial till has been found on the north side of the bluff, suggesting that the last glacier terminated there. It is a county park.

Raspberry - July

Raspberry bushes thrive in the sunny clearings in woods. Ice Age Trail hikers are almost as apt to come across a patch of cultivated raspberry bushes that is a remnant of an abandoned farm as they are apt to find the wild species. The wild plant forager should look for the powdery white canes and the leaflets that are whitish-green beneath. The harvest varies from year to year, so that the patch that yields quarts one year may only yield a pint the next.



SUMMERTON BOG, MARQUETTE COUNTY

This 428-acre marsh is located three miles northeast of Endeavor, south of Freedom Road. A complex of wetland types (including most importantly fen, tamarack swamp, shrub-carr and sedge meadow), the marsh is a refuge for many plants and animals, such as at least nine species of orchids, sundew, pitcher plant; sandhill cranes, and warblers. The scientific area includes a small upland island in the marsh wooded with oaks. It has been preserved, largely through the volunteer efforts of Russell Morris, as a Nature Conservancy project. Wet, mucky soil precludes heavy human traffic. Ditching and conversion of the privately held portions to agricultural land threaten the integrity of the entire marsh.

MUIR PARK NATURAL AREA, MARQUETTE COUNTY

The 150-acre area, John Muir's boyhood homesite, lies in southern Marquette County on the east side of Marquette County Highway F about nine miles south of Montello and 11 miles north of Portage. The scientific area consists of the 30-acre Ennis Lake, a small fen on the west side, and a mosaic of vegetation types (low prairie, tamarack, sedge meadow, shrub-carr) on the north and east shores. The lake occupies a marshy pocket in the ground moraine, and has spring and seepage-fed water contributing to its high water clarity. A large number of rare native species may be found in the wetland communities adjacent to the lake. Park development is limited to the lake's west side. Motorboats are prohibited on the small lake, which has been chemically treated.

LAWRENCE CREEK, MARQUETTE COUNTY

This 25-acre portion of Lawrence Creek, four miles west of Westfield and .25 mile east of the Adams County line, just north of Eagle Avenue, is about 1.5 miles from its origin in the Central

Plain ground moraine. The stream is an important spawning area for brook trout, and due to the research done here by DNR biologists on trout ecology, life history, and management, the stream has received international recognition. Seepage springs and short spring runs contribute high quality water to the stream. Oaks, basswood, alder, and willow provide stream cover. Research has been conducted on the stream since 1952. The stream is heavily fished. No management to bank cover or in the stream is allowed on this section.

DELLS OF THE EAU CLAIRE RIVER, MARATHON COUNTY

This 40-acre area is within Marathon County Park, 15 miles east of Wausau, 1.5 miles north of County Highway Z on County Highway Y. The scientific area includes about 1,000 feet of the Eau Claire River where it cascades over the very resistant metamorphic bedrock (rhyolite schist) formed by volcanic eruptions 2 billion years ago, and eroded by the Wisconsin Glacier 10,000 years ago. The bedrock has been tilted to a near vertical position, and the river cuts across the rock's cleavage planes. The rocky gorge and adjacent land to the south are wooded with sugar maple, hemlock, yellow birch, mountain maple, and Canada yew. The park is managed for a variety of recreational pursuits, and it receives an intense amount of seasonal use. Hiking trails, including the Ice Age, run through woods and along the river.



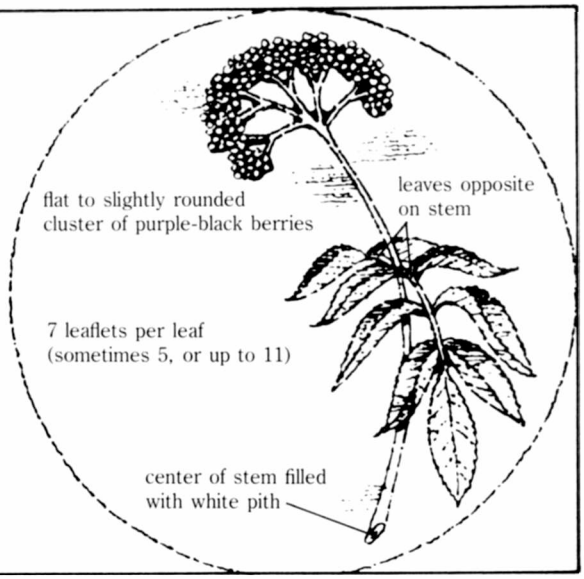
Spring pond lake with surrounding conifer swamp

FLORA LAKE, LANGLADE COUNTY

This 40-acre area, about five miles northeast of Elton, includes a 20-acre spring pond lake, the headwaters of Evergreen Creek, and a surrounding conifer swamp with white cedar, spruce, and

Elderberry - August

As you hike along stream banks or along the edges of ditches you are likely to come across thickets of elderberry. It is easy to spot this bush when, in mid-summer, it sports large clusters of white flowers. The berries appear later, green at first, but finally turning purple-black when ripe in August. It makes for an ideal hiker's nibble for one can easily pick a cluster and then, walking along, eat the tiny berries one by one.



hemlock. A small tamarack and spruce bog to the north drains into the spring pond. Geologically, the area contains more spring ponds than any other in the state. The area is preserved for wilderness and study, with no plans for access improvement.

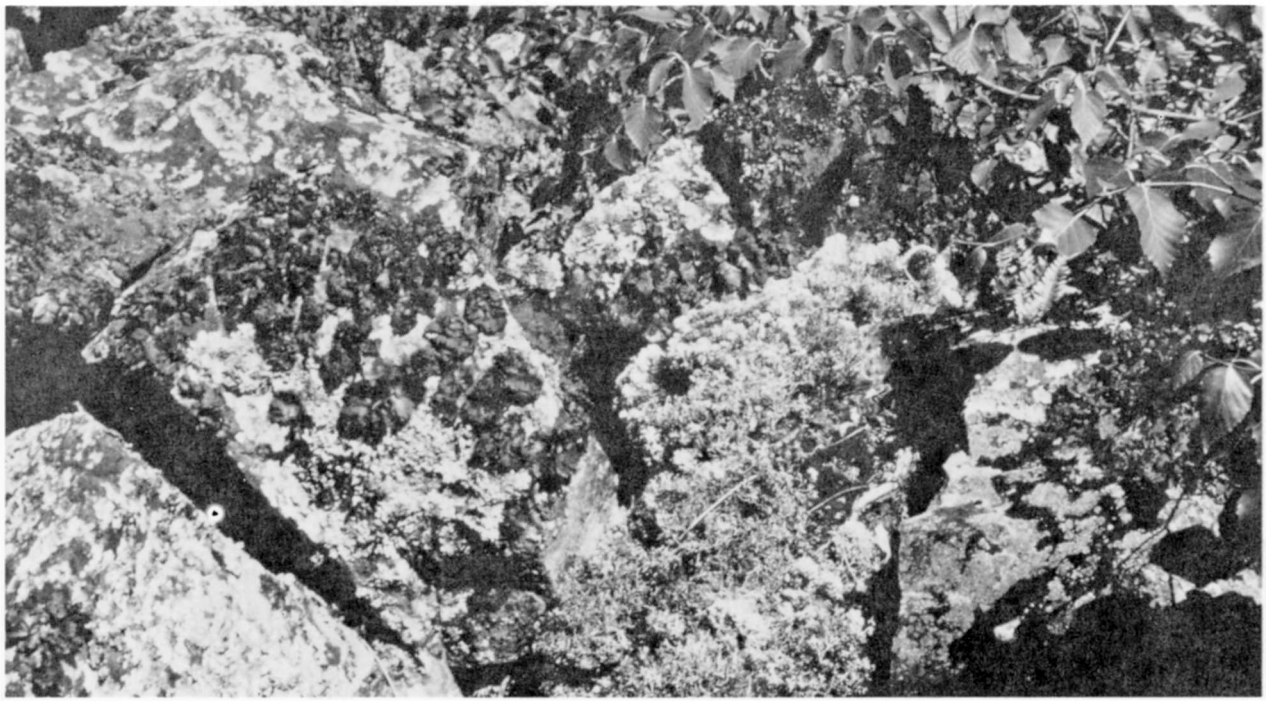
BLUE HILLS FELSENMEER, RUSK COUNTY

This 75-acre area includes all the cliffs, bluffs, and talus slopes with a surrounding no-cut and buffer zone. It is located about 10 miles northwest of Weyerhaeuser. The several small valleys on the south side of the Barron Hills represent a glaciated, exhumed Precambrian quartzite monadnock. During the last glaciation four important actions worked on the bedrock:

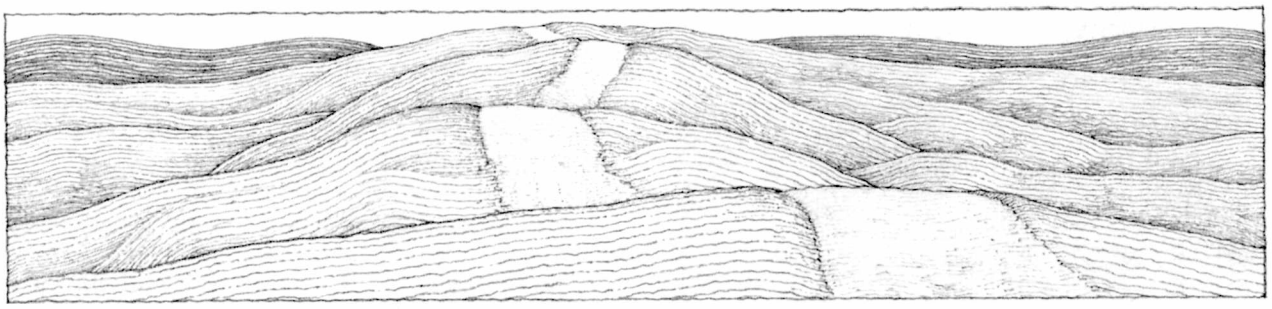
1) canyons eroded and deepened by meltwater;
2) excessive frost action in the tundra climate;
3) earlier glacial drift eroded; and
4) talus slopes of angular rock rubble formed.

It is wooded with second-growth birch, hard maple, and red oak. The area's relative inaccessibility helps preservation.

Blue Hills Felsenmeer—Lichen-covered talus



CHAPTER FOUR



ICE AGE TRAILBLAZERS

Alfred Lunt was an actor. Father Marquette was a missionary. Ella Wheeler Wilcox was a poet of passion. Thorstein Veblen was a social observer of profound dispassion.

What do these people, and the others in this chapter, have in common? Two things, basically.

The first is simply that they were born or brought up or lived somewhere in Wisconsin's Ice Age country. When they were in Wisconsin, to be sure, there was no official Ice Age Trail. In fact, of them all, only Alfred Lunt was fully aware of the Ice Age Trail. That was because he joined the effort to create the Trail, worked hard for it and, perhaps more than most, enjoyed the rewards of living near the Trail and revealing it to friends unaware of its existence—especially friends from the theatrical world. Still, there is no doubt whatever that both John Muir, the naturalist, and Aldo Leopold, the ecologist, were well aware of the landscape fashioned by the last glacier. The work of both inspired, and is continued in, the effort to create the Reserve and the Trail.

Beyond that accident of geographical propinquity, and the fact that all are famous in one degree or another, what binds these trailblazers together? And whatever does so link them, what does it have to do with the special lay of the land and breath of the air that are beloved by those of us who wander the Trail whenever we can?

The particulars are suggested in the brief lives that follow. In general, these Wisconsinites who went on to make their marks in the larger world were indeed affected by the air and the land they grew up in or came to.

The theorist should not push such connections too far, and should certainly avoid any rigid belief that a person is merely the sum total of personal environment. But it seems absurd to contend that the character of the Greeks, the British, or the Norwegians was not in part shaped by the constant presence of the sea, or that the sheer distances of Russia and China had no role in defining the makeup of these peoples.

So here, in a variety of ways, these trailblazers grew up and lived beneath high clear skies, breathed fresh chill air, moved along a landscape unique in the country, where the Ice Age remnants convey a sense of being at the beginning of time. From that experience, our trailblazers, each in his or her own special way, brought metaphorical fresh air into stale places, made us aware of high clear skies, introduced us to fascinating landscapes, and imparted a sense of being present at beginnings.

FATHER MARQUETTE, MISSIONARY

The Reverend Jacques Marquette, S.J., was the first European to visit what is now the Ice Age Trail. Of all the trailblazers, he was most influenced by, and influential with, the native Americans he encountered in his voyages.

He was born in 1637 to a wealthy family in the ancient city of Laon, France, then under the rule of the weak Louis XIII and the powerful Cardinal Richelieu. The city was a Roman outpost and



Father Marquette, missionary

often figured in the confused emergence of France from the 12th Century on.

At 17, the youth entered the Jesuit order. After ordination, he taught at various Jesuit colleges. After repeatedly petitioning for missionary service he was assigned to New France, arriving at Quebec City September 20, 1666.

He immediately took up preaching the Gospel and ministering to the physical needs of the tribes along the complex waterway system that feeds the St. Lawrence River. His extraordinary gift for languages was perhaps the most important qualification he brought to his work. He quickly became expert in six Indian tongues.

The French effort in North America was very different from the British, from which our own heritage here mostly derives. The British Americans were builders of settlements, securing land for their own exclusive use. The Indian had no role in the British scheme. The British lived at peace with the Indians when they could, warred with them when they thought they had to, and fashioned a world in which—from the British point of view—the Indian was at first a menace, later a nuisance, and finally a source of a vague feeling of guilt. Given their drive to settle the New World, it is not surprising that the British Americans left the waterways to build roads. At first the roads were merely paths through the forests, but later they became corduroy roads and plank roads for the convenient transport of goods and people in wheeled vehicles.

Unlike the British, who sought to tame the land and conquer the people, the French sought to accommodate to the land and its inhabitants by focusing on religious conversion and the fur trade. Both these activities presupposed that the Indians would stay where they were and pretty much as they were, with the one crucial change being their hoped-for conversion.

The French adopted the principal mode of Indian travel, using birchbark canoes or dugouts along the network of rivers, streams, and lakes that covered the continent. This use of waterways was essential to Father Marquette's achievements of exploration and discovery for which he is remembered more widely than for his conversions.

He is best known, of course, for his "discovery" of the Mississippi. Marquette, 35, Louis Joliet, a 27-year-old French native of Quebec, and their Indian guides set out on their voyage from St. Ignace mission on Mackinac Island on May 17, 1673. They reached the Mississippi on June 17, 1673.

Marquette had made a much more important "discovery" a few days earlier, and knew he was making it. In crossing the Green Bay Lobe of the Wisconsin Glacier, Marquette and Joliet and their Indian companions had gone up the Fox River to where it seemed to disappear into swamps and marshes near Portage. They then carried their canoes and supplies across this soggy ground to the Wisconsin River. This they followed to its confluence with the Mississippi.

They thus verified what they had been told by the Indians. They had forged the vital water link between waters flowing north and east into the Great Lakes, the St. Lawrence, and the Atlantic; and those flowing south to the Gulf of Mexico.

Their achievement at the Subcontinental Divide at Portage, Wisconsin, was the exact equivalent of the crossing, more than a century and a quarter later, of the Great Divide by Lewis and Clark who, interestingly, followed the French example of traveling by water, and making friends with Indians. The "discovery" at Portage was of continental importance, that of the Mississippi simply its inevitable consequence.

Marquette and Joliet continued down the Mississippi to the mouth of the Arkansas River. They then turned upstream and made their way back, with another portage, to Lake Michigan near the site of Chicago. A final paddle north, and a portage across the Door County peninsula, returned them to their headquarters at Green Bay in September, 1673.

Less than two years later, Marquette contracted an undiagnosed illness while voyaging north from Chicago along the eastern shore of Lake Michigan, near present-day Ludington, Michigan. In a hastily built camp on the shore, he died just before midnight on May 18, 1675. His chronicler reports that "with a countenance beaming and all aglow, he expired without any Struggle, and so gently that it might have been regarded as a pleasant sleep."

Father Marquette Reports on the Ice Age Country

I took pleasure in observing the situation of this village [observed on June 9, 1673, on the Fox River above Lake Winnebago]. It is beautiful and very pleasing; For, from an Eminence upon which it is placed, one beholds on every side prairies, extending farther than the eye can see, interspersed with groves or with lofty trees. The soil is very fertile, and yields much indian corn. The savages gather quantities of plums and grapes, wherewith much wine could be made, if desired.

No sooner had we arrived than we, Monsieur Jollyet and I, assembled the elders together; and he told them that he was sent by Monsieur Our Governor to discover New countries, while I was sent by God to Illumine them with the light of the holy Gospel. He told them that, moreover, The sovereign Master of our lives wished to be known by all the Nations; and that in obeying his will I feared not the death to which I exposed myself in voyages so perilous. He informed them that we needed two guides to show us the way; and We gave them a present, by it asking them to grant us the guides. To this they very Civilly consented; and they also spoke to us by means of a present, consisting of a Mat to serve us as a bed during the whole of our voyage.

On the following day, the tenth of June, two Miamis who were given us as guides embarked with us, in the sight of a great crowd, who could not sufficiently express their astonishment at the sight of seven frenchmen, alone and in two Canoes, daring to undertake so extraordinary and so hazardous an Expedition.

We knew that, at three leagues from Maskoutens, was a River which discharged into Missisipi. We knew also that the direction we were to follow in order to reach it was west-southwesterly. But the road is broken by so many swamps and small lakes that it is easy to lost one's way, especially as the River leading thither is so full of wild oats that it is difficult to find the Channel. For this reason we greatly needed our two guides, who safely Conducted us to a portage of 2,700 paces, and helped us to transport our Canoes to enter That river; after which they returned home, leaving us alone in this Unknown country, in the hands of providence.

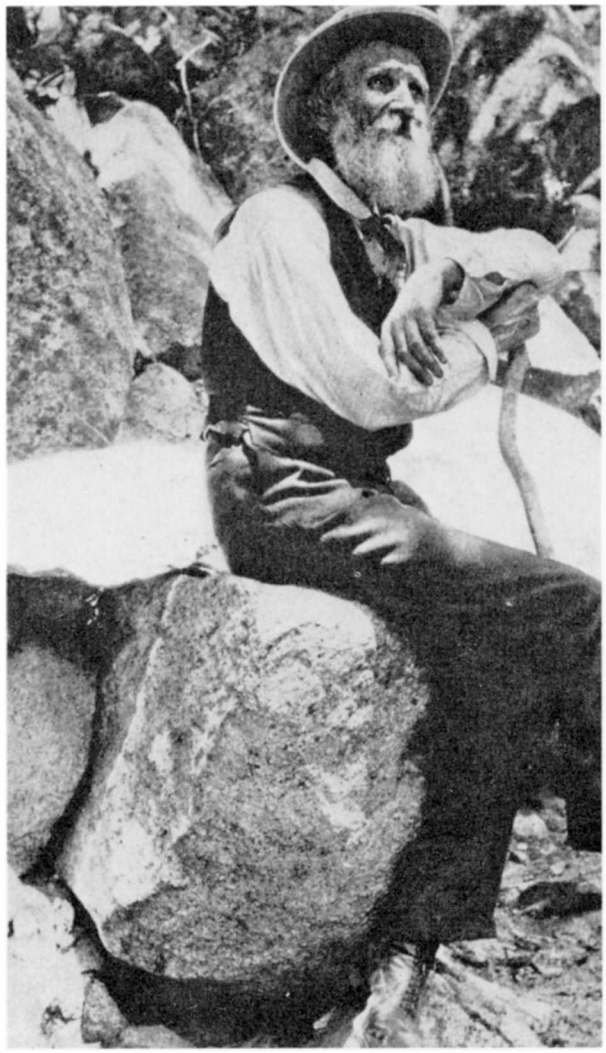
Thus we left the Waters flowing to Quebec, 4 or 500 Leagues from here, to float on Those that would thenceforward Take us through strange lands. Before embarking thereon, we Began all together a new devotion to the blessed Virgin Immaculate, which we practiced daily, addressing to her special prayers to place under her protection both our persons and the success of our voyage; and, after mutually encouraging one another, we entered our Canoes.

The River on which we embarked is called Meskousing ["Wisconsin," meaning "Hole of the Muskrat"]. It is very wide; it has a sandy bottom, which forms various shoals that render its navigation very difficult. It is full of Islands Covered with Vines. On the banks one sees fertile land, diversified with woods, prairies, and Hills. There are oak, Walnut, and basswood trees; and another kind, whose branches are armed with long thorns. We saw there neither feathered game nor fish, but many deer, and a large number of cattle. Our Route lay to the southwest, and, after navigating about 30 leagues, we saw a spot presenting all the appearances of an iron mine; and, in fact, one of our party who had formerly seen such mines, assures us that The One which We found is very good and very rich. It is Covered with three feet of good soil, and is quite near a chain of rocks, the base of which is covered by very fine trees. After proceeding 40 leagues on This same route, we arrived at the mouth of our River; and, at 42 and a half degrees Of latitude, We safely entered Missisipi on The 17th of June, with a Joy that I cannot Express. (From Reuben Gold Thwaites, *The Jesuit Relations and Allied Documents*, Burrows Bros., 1900, Vol. LIX.)

JOHN MUIR, NATURALIST

John Muir was America's premier naturalist. He was more than simply a skilled geologist, botanist, ornithologist, entomologist, and explorer; more than the founder of our national parks and national forests; more than a charming writer of the outdoors. John Muir a hundred years ago previsaged today's Earth Movement when he gave as his address "John Muir, Earth Planet, Universe."

John was born April 21, 1838, in Dunbar, Scotland. In 1849 the family sailed from Glasgow to New York. Reaching Buffalo via the Erie Canal, they heard of the rich wheat fields of



John Muir

Wisconsin, and so took ship by the Great Lakes to Milwaukee. By ox-cart the Muirs transported furniture, farm machinery, and cooking utensils to Marquette County, where the father claimed a quarter section of land and built his home on a little glacial Fountain Lake.

Fountain Lake today looks exactly as it did in John Muir's childhood. The Muirs cleared the land, and toiled from dawn to dark on their fields of wheat, corn, potatoes, and melon. John got to know the strange new birds around Fountain Lake—the whippoorwills, woodpeckers, hawks, kingbirds, bluebirds, loons, partridges, prairie chickens, snipe, nuthatches, chickadees, owls, ducks, and geese.

You can still see glacial kettle holes twenty feet deep near the ruins of the Muir homestead. John would ride his pony around these kettles at break-neck speed, much as a bicyclist would ride a bike on a velodrome at a Wisconsin county fair.

On the cold winter nights, young John learned mathematics, read the Bible, Plutarch, and Shakespeare, invented clocks, water wheels, thermometers, and fire-lighters. From 1860-1863 he studied at the University of Wisconsin. When he left, he wrote: "I was only leaving one university for another, the Wisconsin University for the University of the Wilderness."

After a couple of years roaming in Canada, he conceived the idea of "a thousand-mile walk to the Gulf of Mexico." From Louisville on the Ohio River, he resolved to walk a thousand miles southeasterly through Kentucky, Tennessee, North Carolina, and Georgia to Atlanta, and then on to the Florida Keys. He proposed to travel by the "leafiest, wildest, and least trodden way I could find."

In 1868 Muir sailed from Florida through Panama to California, where he was to make his home for the rest of his life. He explored the Yosemite and the Sequoia areas, and helped incorporate them into the National Park system. President Theodore Roosevelt, who camped with Muir in the High Sierras of the Yosemite in May, 1903, was inspired to found the National Park and National Forest systems.

Muir's interest in glaciers, first quickened by the Wisconsin Ice Age, continued. He walked the living glaciers in the High Sierra, observing how they sandpapered the sharp peaks and canyons.

In 1892 Muir was one of the founders of the Sierra Club. Today, the Wisconsin Sierra Club, John Muir Chapter, has laid out and blazed many miles of the Wisconsin Ice Age Trail.

John Muir did a lot of exploring in Alaska. (He discovered Muir Glacier in Alaska.) His last trip was under the sponsorship of the Union Pacific Railroad tycoon, E. H. Harriman. Muir's *The Story of My Boyhood and Youth* was dictated to E. H. Harriman's secretary after their Alaskan cruise in 1899. In the 1960s, Harriman's sons, Averell and Roland, helped to preserve John Muir's boyhood home on Fountain Lake with a generous contribution.

John Muir died in California on December 24, 1914.



Muir's Lake

John Muir on Fountain Lake, Marquette County

Our beautiful lake, named Fountain Lake by father but Muir's Lake by the neighbors, is one of the many small glacier lakes that adorn the Wisconsin landscapes. It is fed by twenty or thirty meadow springs, is about half a mile long, half as wide, and surrounded by low finely-modeled hills dotted with oak and hickory, and meadows full of grasses and sedges and many beautiful orchids and ferns. First there is a zone of green, shining rushes, and just beyond the rushes a zone of white and orange waterlilies fifty or sixty feet wide forming a magnificent border. On bright days, when the lake was rippled by a breeze, the lilies and sun-spangles danced together in radiant beauty, and it became difficult to discriminate between them.

Never shall I forget our first sail over the gradually deepening water, the sunbeams pouring through it revealing the strange plants covering the bottom, and the fishes coming about us, staring and wondering as if the boat were a monstrous strange fish.

The water was so clear that it was almost invisible, and when we floated slowly out over the plants and fishes, we seemed to be miraculously sustained in the air while silently exploring a veritable fairyland....We gradually learned something about its inhabitants—pickerel, sunfish, black bass, perch, shiners, pumpkinseeds, ducks, loons, turtles, muskrats.

(Muir, *The Story of My Boyhood and Youth*, 1914.)

INCREASE A. LAPHAM, SCIENTIST

Increase Lapham, first scientist of Wisconsin, was born in 1811, two years after Abraham Lincoln. Like Lincoln, he was self-educated. As a boy of 13 in upstate New York, he worked as a surveyor on the Erie Canal. There, breaking open a huge rock, he uncovered his first fossil. A life of natural history opened before him.

At 19 he went out to Ohio for a job on the Portsmouth Canal. There he started his lifelong collecting of minerals and plants.

In 1836 Byron Kilbourn, the Milwaukee land speculator, offered him a job as surveyor and real estate developer. Lapham moved to Milwaukee, and lived there all his life.

He immediately published his *Catalogue of Plants and Shells Found in the Vicinity of Milwaukee*. His passion for natural things took him exploring all over Wisconsin, particularly the oak openings, moraines, and wetlands of what is now the Southern Kettle Moraine State Forest, and the startling geology of Devil's Lake. In 1846 came his monumental *Wisconsin: Its Geography and Topography, History, Geology, and Mineralogy*.

Just as the hiker on the Ice Age Trail will today marvel at the Indian effigies along the

route—Lizard Mounds in Washington County and Man Mound in Sauk County—Lapham was enchanted by the mounds he discovered. The Smithsonian in 1855 published his *The Antiquities of Wisconsin*.

Though without formal education, Lapham became a leading educator. He was successively a member of the Milwaukee School Board, president of the trustees of Milwaukee Female College (later Milwaukee-Downer College and still later Lawrence University), president of the State Historical Society, and charter member of the Wisconsin Academy of Sciences, Arts, and Letters.

His early interest in meteorology led him to lobby Congress successfully to establish the U.S. Weather Bureau in 1869. Offered the post of first chief of the Bureau, he noted that the Bureau was then part of the Department of War, and as a lifelong Quaker, turned it down. But in 1870 he established a weather station on Lapham Peak, as it is now called, in Waukesha County. There he received storm warnings from Pike's Peak in Colorado, and alerted Great Lakes ships to their danger.

He was made State Geologist in 1873. He shortly retired to his Oconomowoc Lake farm, and there in 1875 he died of a heart attack while boating on the lake.

Aldo Leopold, ecologist



ALDO LEOPOLD, ECOLOGIST

Aldo Leopold was born at Burlington, Iowa, on January 11, 1887, the son of a furniture manufacturer. His boyhood was spent hunting and fishing in the forests and fields of the Mississippi River bottomlands. After attending the Yale School of Forestry, he became a forest assistant with the then new U.S. Forest Service in 1909. He advanced until he became Chief of Operations in the Arizona and New Mexico district. It was his idea to set aside forest areas as permanently protected wilderness. He was a founder of the Wilderness Society.

In 1924 he was made Associate Director of the U.S. Forest Products Laboratory at Madison. From 1928 to 1931 he conducted technical surveys of wildlife populations for the Sporting Arms and Ammunition Institute, and he did consulting work for various states. He was a member of the old Wisconsin Conservation Commission. He occupied the chair of game management created for him in 1933 at the University of Wisconsin. He stressed wildlife habitat as the ecological key.

He died on April 21, 1948, while helping a neighbor fight a grass fire near his Sand County farm on the Wisconsin River.

Leopold's Sand County farm is still used by his family. The farm is near the Ice Age Trail, but its exact location will not be given here out of deference to the family. Meanwhile, the landscape he loved appears in many places as the Ice Age Trail parallels the Wisconsin River.

Aldo Leopold proclaimed the conservation ethic, and founded the ecological movement.

Aldo Leopold, from A Sand County Almanac

There are some who can live without wild things, and some who cannot. These essays are the delights and dilemmas of one who cannot.

Like winds and sunsets, wild things were taken for granted until progress began to do away with them. Now we face the question whether a still higher 'standard of living' is worth its cost in things natural, wild, and free. For us of the minority, the opportunity to see geese is more important than television, and the chance to find a pasque-flower is a right as inalienable as free speech.

These wild things, I admit, had little human value until mechanization assured us of a good breakfast, and until science disclosed the drama of where they come from and how they live. The whole conflict thus

boils down to a question of degree. We of the minority see a law of diminishing returns in progress; our opponents do not.

* * *

Conservation is getting nowhere because it is incompatible with our Abrahamic concept of land. We abuse land because we regard it as a commodity belonging to us. When we see land as a commodity to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanized man, nor for us to reap from it the esthetic harvest it is capable, under science, of contributing to culture.

That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics. That land yields a cultural harvest is a fact long known, but latterly often forgotten.

Such a view of land and people is, of course, subject to the blurs and distortions of personal experience and personal bias. But wherever the truth may lie, this much is crystal-clear: our bigger-and-better society is now like a hypochondriac, so obsessed with its own economic health as to have lost the capacity to remain healthy. The whole world is so greedy for more bathtubs that it has lost the stability necessary to build them, or even to turn off the tap. Nothing could be more salutary at this stage than a little healthy contempt for a plethora of material blessings.

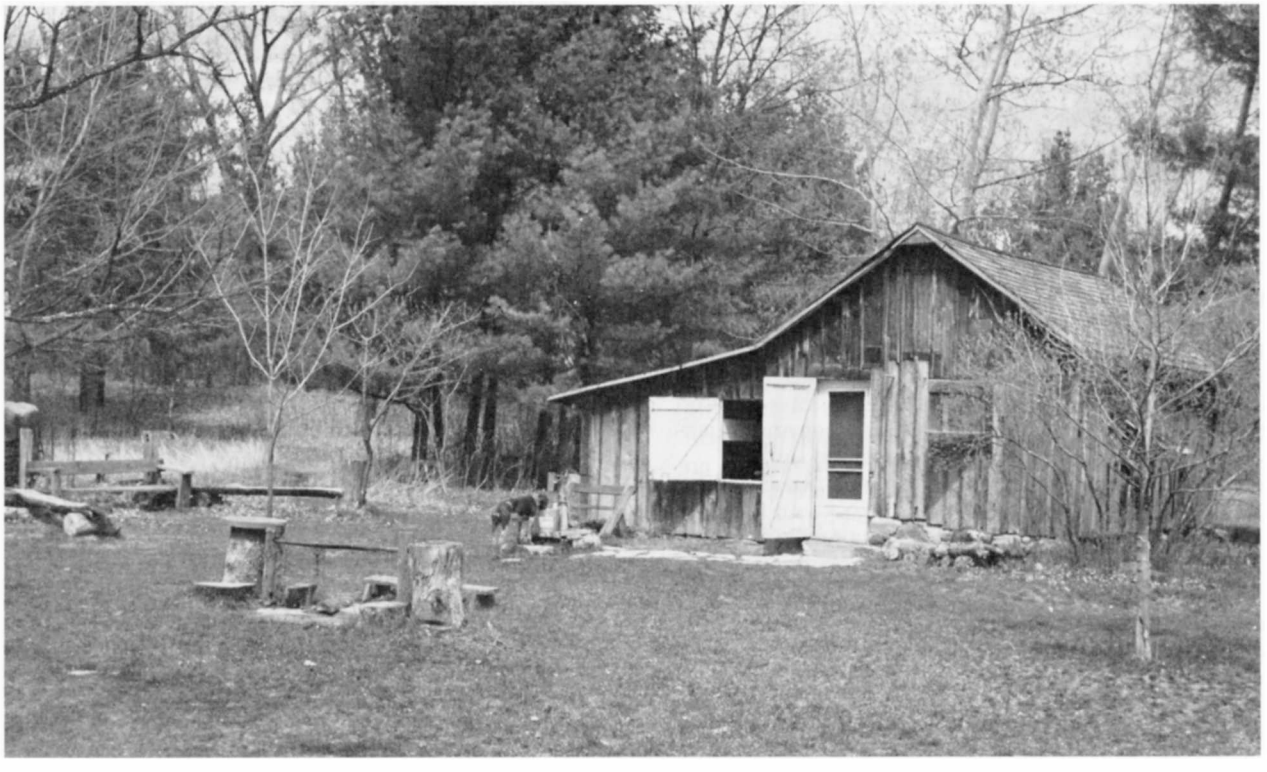
Perhaps such a shift of values can be achieved by reappraising things unnatural, tame, and confined in terms of things natural, wild, and free.

* * *

When the glacier came down out of the north, crunching hills and gouging valleys, some adventuring rampart of the ice climbed the Baraboo Hills and fell back into the outlet gorge of the Wisconsin River. The swollen waters backed up and formed a lake half as long as the state, bordered on the east by cliffs of ice, and fed by the torrents that fell from melting mountains. The shorelines of this old lake are still visible; its bottom is the bottom of the great marsh.

The lake rose through the centuries, finally spilling over east of the Baraboo range. There it cut a new channel for the river, and thus drained itself. To the residual lagoons came the cranes, bugling the defeat of the retreating winter, summoning the on-creeping host of living things to their collective task of marsh-building. Floating bogs of sphagnum moss clogged the lowered waters, filled them. Sedge and leatherleaf, tamarack and spruce successively advanced over the bog, anchoring it by their root fabric, sucking out its water, making peat. The lagoons disappeared, but not the cranes. To the moss-meadows that replaced the ancient waterways they returned each spring to dance

Aldo Leopold's shack in Sauk County



and bugle and rear their gangling sorrel-colored young. These, albeit birds, are not properly called chicks, but *colts*. I cannot explain why. On some dewy June morning watch them gambol over their ancestral pastures at the heels of the roan mare, and you will see for yourself.

One year not long ago a French trapper in buckskins pushed his canoe up one of the moss-clogged creeks that thread the great marsh. At this attempt to invade their miry stronghold the cranes gave vent to loud ribald laughter. A century or two later Englishmen came in covered wagons. They chopped clearings in the timbered moraines that border the marsh, and in them planted corn and buckwheat. They did not intend, like the Great Khan at Changanor, to feed the cranes. But the cranes do not question the intent of glaciers, emperors, or pioneers. They ate the grain, and when some irate farmer failed to concede their usufruct in his corn, they trumpeted a warning and sailed across the marsh to another farm.

There was no alfalfa in those days, and the hillfarms made poor hay land, especially in dry years. One dry year someone set a fire in the tamaracks. The burn grew up quickly to bluejoint grass, which, when cleared of dead trees, made a dependable hay meadow. After that, each August, men appeared to cut hay. In winter, after the cranes had gone South, they drove wagons over the frozen bogs and hauled the hay to their farms in the hills. Yearly they plied the marsh with fire and axe, and in two short decades hay meadows dotted the whole expanse.

Each August when the haymakers came to pitch their camps, singing and drinking and lashing their teams with whip and tongue, the cranes whinnied to their colts and retreated to the far fastnesses. "Red shitepokes" the haymakers called them, from the rusty hue which at that season often stains the battleship-gray of crane plumage. After the hay was stacked and the marsh again their own, the cranes returned, to call down out of October skies the migrant flocks from Canada. Together they wheeled over the newcut stubbles and raided the corn until frosts gave the signal for the winter exodus.

These haymeadow days were the Arcadian age for marsh dwellers. Man and beast, plant and soil lived on and with each other in mutual toleration, to the mutual benefit of all. The marsh might have kept on producing hay and prairie chickens, deer and muskrat, crane-music and cranberries forever.

The new overlords did not understand this. They did not include soil, plants, or birds in their ideas of mutuality. The dividends of such a balanced economy were too modest. They envisaged farms not only around, but *in* the marsh. An epidemic of ditch-digging and land-booming set in. The marsh was gridironed with drainage canals, speckled with new fields and farmsteads.

But crops were poor and beset by frosts, to which the expensive ditches added an aftermath of debt. Farmers moved out. Peat beds dried, shrank, caught fire. Sun-energy out of the Pleistocene shrouded the countryside in acrid smoke. No man raised his voice against the waste, only his nose against the smell. After a dry summer not even the winter snows could extinguish the smoldering marsh. Great pockmarks were burned into field and meadow, the scars reaching down to the sands of the old lake, peat-covered these hundred centuries. Rank weeds sprang out of the ashes, to be followed after a year or two by aspen scrub. The cranes were hard put, their numbers shrinking with the remnants of unburned meadow. For them, the song of the power shovel came near being an elegy. The high priests of progress knew nothing of cranes, and cared less. What is a species more or less among engineers? What good is an undrained marsh anyhow?

For a decade or two crops grew poorer, fires deeper, wood-fields larger, and cranes scarcer, year by year. Only reflooding, it appeared, could keep the peat from burning. Meanwhile cranberry growers had, by plugging drainage ditches, reflooded a few spots and obtained good yields. Distant politicians bugled about marginal land, over-production, unemployment relief, conservation. Economists and planners came to look at the marsh. Surveyors, technicians, CCCs, buzzed about. A counter-epidemic of reflooding set in. Government bought land, resettled farmers, plugged ditches wholesale. Slowly the bogs are re-wetting. The firepocks became ponds. Grass fires still burn, but they can no longer burn the wetted soil.

All this, once the CCC camps were gone, was good for cranes, but not so the thickets of scrub popple that spread inexorably over the old burns, and still less the maze of new roads that inevitably follow governmental conservation. To build a road is so much simpler than to think of what the country really needs. A roadless marsh is seemingly as worthless to the alphabetical conservationist as an undrained one was to the empire-builders. Solitude, the one natural resource still undowered of alphabets, is so far recognized as valuable only by ornithologists and cranes.

Thus always does history, whether of marsh or market place, end in paradox. The ultimate value in these marshes is wildness, and the crane is wildness incarnate. But all conservation of wildness is self-defeating, for to cherish we must see and fondle, and when enough have seen and fondled, there is no wilderness left to cherish.

* * *

Some day, perhaps in the very process of our benefactions, perhaps in the fullness of geologic time, the last crane will trumpet his farewell and spiral skyward from the great marsh. High out of the clouds will fall the sound of hunting horns, the baying of the phantom pack, the tinkle of little bells, and then a silence never to be broken, unless perchance in some far pasture of the Milky Way. (Aldo Leopold, *A Sand County Almanac*, Oxford University Press, 1949)

THORSTEIN VEBLEN, ECONOMIST

Thorstein Veblen thought boldly about economics and sociology. In his first book, *The Theory of the Leisure Class,* in 1899, he viewed the rich, with their "conspicuous consumption" and "pecuniary emulation," as specimens for study, just as anthropologists were already doing with peoples in various cultures.

Veblen's scientific detachment suited his position as an outsider. That position was established at his birth on July 30, 1857, in the bleak farm his Norwegian immigrant father, Thomas Veblen, had pioneered in 1854 in Cato Township, near Valders in Manitowoc County.*

Veblen's parents were "Scandihoofians," outsiders among the area's prominent Americans of Yankee stock. They had emigrated from Norway in 1847. Also, they were Norwegian in a largely Icelandic countryside, and thus outsiders even within the Scandinavian immigrant community. And they were farmers: outsiders to the townsfolk who provided the market for agricultural products and farmer's needs.

Also, they were not then particularly successful farmers. Perhaps the initial poor showing of the Veblen family's Wisconsin farm effort had much to do with the condition of the land left by the glacier's edge. There were variously sized collections of rocks and gravel and depressions and hills, all of which made for difficult farming. And the 50-percent interest rate on their mortgage loan did not help. In short, during Veblen's first formative years, he and his family were impecunious outsiders.

Abandoning the rock-studded earth of Valders in 1865, the family moved to the rich earth of Minnesota. Thomas Veblen bought land and built a house for his children to live in while attending Carlton College.

*Locating the Veblen farm was not easy. The Manitowoc County Register of Deeds contained no entry for a Thomas Veblen. Early in 1980, the historian appealed to Valders Police and Fire Chief William Wiegert for help. Chief Wiegert immediately called his neighbor, the Valders historian Adam Bartel. Bartel knew that Thomas Veblen was the son of Anders Veblen, and wanted to Americanize himself. So he looked in the Registry of Deeds for Thomas the son of Anders, and found his man: "Thomas Anderson" bought the land in 1854, one mile north and a little west of Valders! The fieldstone foundation of the Veblen homestead still stands.

Throughout his life, Thorstein continued to be an outsider in his original, trailblazing thought and writing.

Although there were always a few academics who recognized his genius, he was never accepted in any of the academic communities in which he found himself—Yale, Cornell, Chicago, Stanford, Missouri. His irritating way of looking freshly at assumptions more docile scholars took for granted spread discomfort among the affluent Americans who were the financial patrons and governing trustees of most universities.

Even more distressing were his free and easy ways with the wives of his colleagues, including one famous case that involved the wife of a university president.

It was oddly appropriate that after a lifetime of scrutinizing the habits of the rich primitives and their dependents in academia, Veblen mounted his last major intellectual effort in a study of the sagas of his Norseland ancestors—lands which, like Wisconsin, were profoundly shaped by the glaciers of the Ice Age.

He died in California on August 3, 1929.

Thorstein Veblen On Yankee Townspeople and Norwegian Immigrants

The foreign immigrants did the work necessary to the reclamation of this stretch of fertile land, and the native-born in the towns did the business. This business was prevailingly of a prehensile character, being carried on by men well at home in the common law of the land directed at getting something for nothing at the expense of the foreign immigrants who were unfamiliar with the common law. Being, in the view of their masters, aliens in the land, the foreign immigrants were felt to have no claim to consideration beyond what the laws that they did not know would formally secure to them in case matters were brought to the legal test. The presumption in the mind of honest businessmen at all points was on the side of their own pecuniary advantage, leaving any doubts to be settled by eventual litigation that might be brought by the foreign immigrants—who could with great uniformity be relied on most meticulously to avoid all litigation under a system of law with which they had no acquaintance, before local magistrates (businessmen) whom they had no reason to trust, in a language which they did not understand. (*The Laxdaela Saga,* B. W. Huebsch, Inc., 1925)

On Timber Barons

None of this passionate endeavor of the lumbermen to get rich quick has been wilfully destructive. It is only that as it has been conducted, and as it could not but be conducted according to sound business princi-

ples, a destructive waste of the timber supply has been involved in it and a greater waste and destruction has unfailingly followed it up. It is always sound business practice to take any obtainable net gain, at any cost and at any risk to the rest of the community. The Captains of Industry who have been engaged in this enterprise of disemboweling the country's timber resources and who have profited by it have been quite within their rights and within the ethics of business. Not only so; commonly if not invariably their conduct is heartily approved and admired by their fellow citizens, and they have come through the adventure with a greatly augmented self-respect and a very notable conviction of well-doing.

They, the successful ones, have become substantial citizens, bearing all the stigmata of civic substance and merit. And after the pattern of substantial American citizens they have, not unusually, gone on and acquired further merit by devoting some part of their takings to conspicuously humane works. There are towns, not a few, that have been named in reverent memory of these enterprising men, and there are many parks, hospitals, museums, libraries, fountains, school and town edifices, and other municipal works, in many towns and cities in these states, which bear their name and carry forward the memory of their munificence. Indeed, so highly do their fellow citizens esteem their meritorious work in so having disembowelled the country's timber resources, that they have not uncommonly been called by popular vote to take over the business of governing the country whose resources they have disembowelled, in legislative and administrative office, in the states and in the Federal Government. There is, broadly speaking, no fault to be found with them or their works, or at least no fault is found, by themselves or by their fellow citizens. Their rating, in the popular esteem and in their own, is reflected by the fact that a very appreciable and honorable number of these men have proved to be substantial and public-spirited enough to find their way into the federal senate, sometimes even at a cash outlay which it might be inconvenient to specify; and here they have honorably "stood pat," embattled in defense of the principles of business-as-usual, and have honorably kept faith with all the vested interests. In short, they run meritoriously true to the American ideal of the self-made man who knows that his work is well done. (*Absentee Ownership,* B.W. Huebsch, Inc., 1923)

FREDERICK JACKSON TURNER, HISTORIAN

Turner was born on November 14, 1861, in Portage. His father, Andrew Jackson Turner, who had arrived in 1858 from upstate New York, was a newspaper editor and later a mayor. Their simple wooden home had a two-ton glacial boulder in the front yard.



Frederick Jackson Turner, historian

Young Fred acquired his father's love for fishing in the nearby streams and lakes, and he remained a fisherman and outdoorsman all his life.

Portage, with a population of around 4,000, was a frontier town. Outlaws battled each other on the main street of Portage. Vigilantes hanged men from any convenient tree. Prairie schooners lumbered by on their way to the West. Down the Wisconsin River floated rafts of logs from the North.

Young Turner went on from Portage to the University at Madison, from which he was graduated in 1881, and where he taught history from 1892 to 1910.

Turner's great contribution to history was contained in a speech, "The Frontier in American History," at the 1893 Chicago World's Fair (published with other essays in 1920). His thesis was that the American frontier and its free land, observed in his Portage boyhood, offered the robust the chance to shape truly democratic institutions. Turner saw the ending of the frontier, and wondered whether Americans could afterwards "reconcile real greatness with bigness."

Turner was a professor of history at Harvard from 1910 to 1924. He retired to Pasadena, California, and he died on March 14, 1932.

The student of the Wisconsin frontier would do well to look at two of Turner's neighbors: Hamlin Garland (1860-1940), who lived 60 miles northwest of Portage at West Salem, and August Derleth (1909-1977) of Sauk City, 20 miles downstream on the Wisconsin River. Garland's autobiographical novel, *A Son of the Middle Border* (1917), tells of the independent, hard-working, nonconformist farmer who sees the frontier disappear, and turns to populism to win in the political arena the progress that he had once won for himself in the woodland clearing. Garland published hundreds of works. Equally prolific was Derleth. In his novels, short stories, and journals, Derleth too wrote of the middle border and its people.

Frederick Jackson Turner on the Middle West

Over most of the Province of the Lake and Prairie Plains the Laurentide glacier spread its drift, rich in loess and other rock powder, which farmers in less favored sections must purchase to replenish the soil. The alluvial deposit from primeval lakes contributed to fatten the soil of other parts of the prairies. It is a land marked out as the granary of the nation; but it is more than a granary. On the rocky shores of Lake Superior were concealed copper mines rivaled only by those of Montana, and iron fields which furnish the ore for the production of eighty per cent of the pig iron of the United States. The Great Lakes afford a highway between these iron fields and the coal areas of the Ohio Valley. The gas and oil deposits of the Ohio Valley, the coal of Illinois, Iowa, Michigan, and eastern Kansas, the lead and zinc of the Ozark region and of the upper Mississippi Valley, and the gold of the Black Hills—all contribute underground wealth to the Middle West.

* * *

The ideals of the Middle West began in the log huts set in the midst of the forest a century ago. While his horizon was still bounded by the clearing that his ax had made, the pioneer dreamed of continental conquests. The vastness of the wilderness kindled his imagination. His vision saw beyond the dank swamp at the edge of the great lake to the lofty buildings and the jostling multitudes of a mighty city; beyond the rank, grass-clad prairie to the seas of the golden grain; beyond the harsh life of the log hut and the sod house to the home of his children, where should dwell comfort and the higher things of life, though they might not be for him. The men and women who made the Middle West were idealists, and they had the power of will to make their dreams come true. Here, also, were the pioneer's traits—individual activity, inventiveness, and competition for the prizes of the rich province that awaited exploitation under freedom and equality of opportunity. He honored the man whose eye was the quickest and whose grasp was the strongest in this contest: it was "every one for himself."

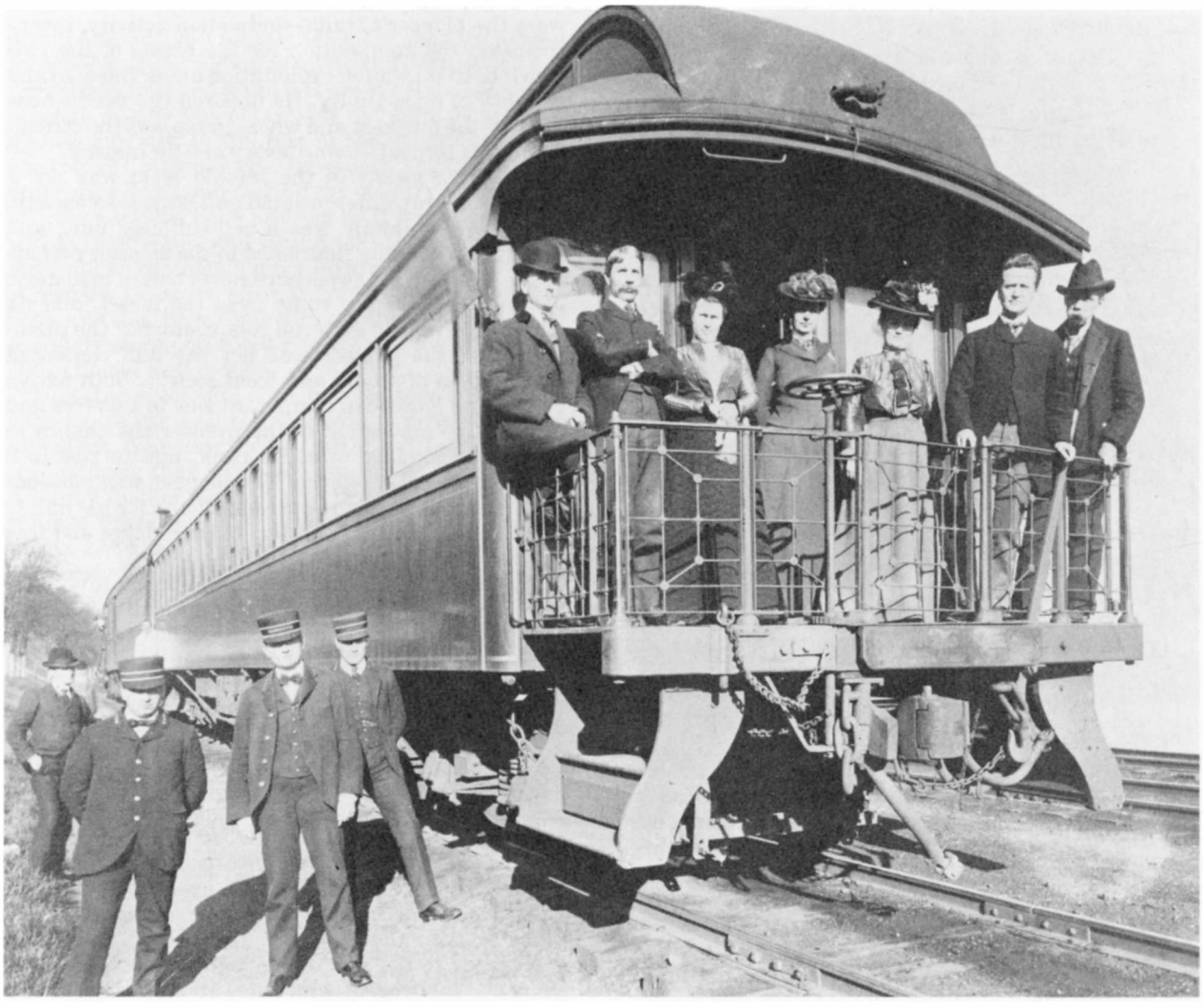
The early society of the Middle West was not a complex, highly differentiated and organized society. Almost every family was a self-sufficing unit, and liberty and equality flourished in the frontier periods of the Middle West as perhaps never before in history. American democracy came from the forest, and its destiny drove it to material conquests; but the materialism of the pioneer was not the dull contented materialism of an old and fixed society. Both native settler and European immigrant saw in this free and competitive movement of the frontier the chance to break the bondage of social rank, and to rise to a higher plane of existence. The pioneer was passionately desirous to secure for himself and for his family a favorable place in the midst of these large and free but vanishing opportunities.

The ideals of equality, freedom of opportunity, faith in the common man are deep rooted in all the Middle West. The frontier stage, through which each portion passed, left abiding traces on the older, as well as on the newer, areas of the province. Nor were these ideals limited to the native American settlers: Germans and Scandinavians who poured into the Middle West sought the country with like hopes and like faith. These facts must be remembered in estimating the effects of the economic transformation of the province upon its democracy. The peculiar democracy of the frontier has passed away with the conditions that produced it; but the democratic aspirations remain. They are held with passionate determination.

The task of the Middle West is that of adapting democracy to the vast economic organization of the present. This region which has so often needed the reminder that bigness is not greatness may yet show that its training has produced the power to reconcile popular government and culture with the huge industrial society of the modern world. The democracies of the past have been small communities, under simple and primitive economic conditions. At bottom the problem is how to reconcile real greatness with bigness. (The Middle West, 1901, in *The Frontier in American History,* Holt, 1920)

ROBERT MARION LA FOLLETTE, PROGRESSIVE

Robert M. ("Fighting Bob") La Follette was the most significant single force in shaping the new kind of Wisconsin politics that has been associated with the state ever since. But his influence on political style and substance was nationwide.



La Follette campaign train in 1900

His approach to politics is not easy to define. But Wisconsinites and other upper Midwesterners know it well. So do students of political science and American history. It is summed up in the name of the Progressive Movement, which La Follette founded when he left the Republican party after being offered (and refusing) a bribe from a GOP leader.

The Movement has had a fitful life since La Follette passed from the political scene. But the *Progressive* magazine still survives as a national observer of government and politics. More important, the La Follette-Progressive spirit flourishes among many voters and their chosen political representatives on numerous levels of government, in many cities and states, and in both major American parties.

La Follette Progressivism takes one of its directions from the introduction of the direct primary election as a means of choosing candidates, a reform that Fighting Bob fought for in Wisconsin and finally successfully established as an essential part of the state's political process. Today it is quite possible that the primary system has gone too far. The reform itself may be in need of reform. But the civic virtue of the primary idea has never been in doubt, especially when contrasted with the formerly prevailing methods of selecting political candidates in smoke-filled rooms or in conventions peopled

entirely by political bosses and their hand-picked delegates. The direct primary election was a first step toward what is today called participatory democracy.

The second broad principle of La Follette's Progressivism is its willingness to use government as a tool to protect citizens in need of protection from the ravaging of fellow-citizens of greater economic strength, individual and corporate. One of La Follette's early battles was the successful effort to regulate railroads in Wisconsin, and the corresponding fight to build roads with state support.

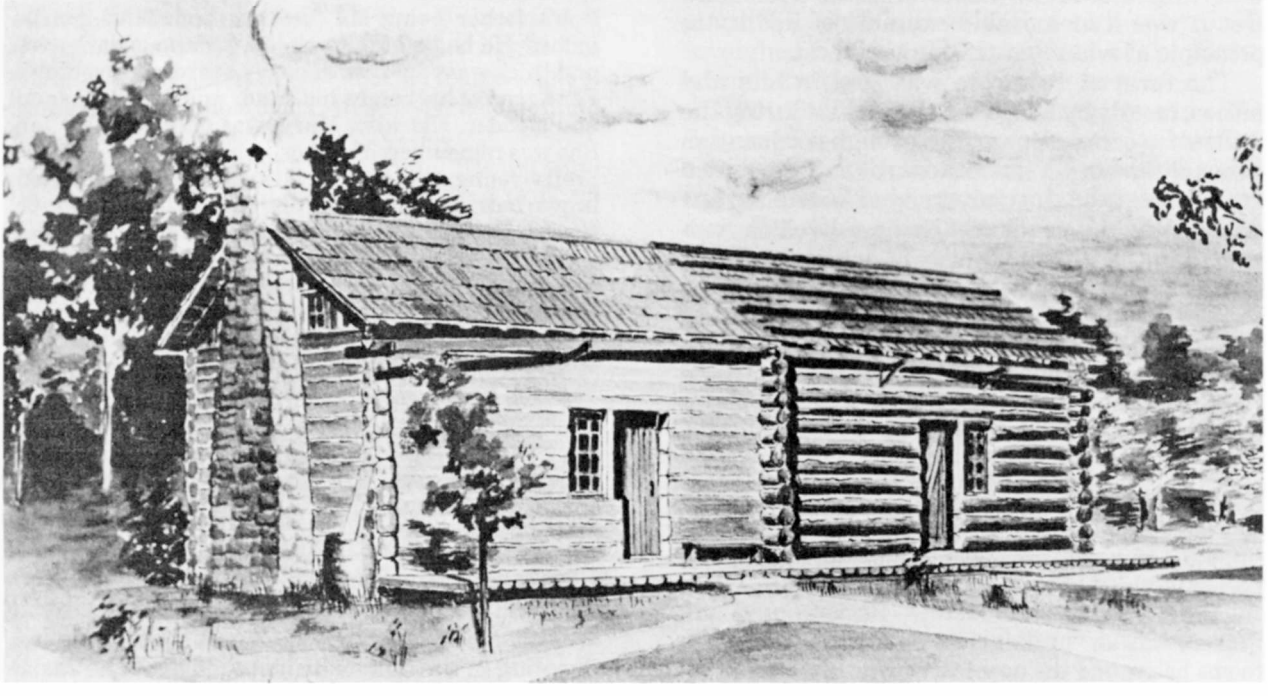
Robert La Follette was born in Primrose Township, Dane County, in 1855. His family originally came to America as French Huguenots. Although driven out of formal religious observance by the fervent fundamentalism of his stepfather, La Follette revived that old family tradition of a willingness to sacrifice for deeply-held principles. Like many other new Americans, his ancestors went West after the Revolution. They settled first in Kentucky and later in Indiana. At some point the La Follettes were fiends with the Lincolns. The inspiration of Abraham Lincoln made La Follette first a Republican and later a dedicated "emancipator" himself.

The family arrived in Primrose in 1850. By 1855, when Robert was born, the La Follettes were thoroughly immersed in the American pioneer enterprise—acquiring land, building a home, planting and harvesting, making at home all the necessities that could be made there, bartering for others, and buying the rest with earnings from their cash crops. Among other things, this background qualified La Follette to be a member of the last significant generation of American politicians who were "born in a log cabin."

The cabin is no longer there, but a bronze plaque set in a large, ice-age boulder, marks its location. But there was a great deal more to La Follette's formative years on the farm at Primrose than that once-advantageous American political nativity. He grew up as a member of a family and a frontier community both working together to solve mutual problems, to be self-sufficient in family and communal endeavors, and to be aware of and actively resist the manipulations of assorted outside exploiters—most notably land speculators, who did nothing with land but buy it cheap and sell it dear.

The pioneer community lived a kind of economic democracy that influenced the thought of the mature Bob La Follette profoundly. The fam-

The La Follette Log Cabin at Primrose



ily left Primrose for Argyle when Bob was only seven years old. But in her biography, his wife, Belle Case La Follette, says (with the authority of a life spent working with him): "The village of Primrose, Wisconsin, was the cradle of his enduring faith in democracy."

In the politics of his state and his country, La Follette started out as pretty much a straight, organization Republican. He was elected to Congress in 1885 and served three terms, undoubtedly "getting along by going along." as Congressional wisdom phrased the process of progress through the Congressional hierarchy. The tendency toward orthodoxy must have been strong for La Follette, who, at 29, was the youngest member of the 49th Congress. But when faced with the decision of whether to break with the Republican party regulars, La Follette, out of political shrewdness and natural inclination, turned to the operating principles he had learned back in Primrose.

La Follette went on to become governor of Wisconsin three times. In that position he did much to give the state its special political flavor. He later was elected to the United States Senate, continuing to influence Wisconsin through Progressive incumbency. In 1917, La Follette was the only U.S. Senator to vote against the Declaration of War asked by Woodrow Wilson. That vote killed forever the hopes La Follette had entertained of himself becoming the President. But it was a memorable example of fidelity to principle at whatever the political cost.

The farm at Primrose was sold in bits and pieces, mostly by La Follette's mother during the difficult process of ensuring the higher education of her children, which, in Robert's case, included graduation from the University of Wisconsin law school. But the spirit of Primrose lives on, embodied in the Wisconsin way of politics and government. From his wife's biography:

The Log Cabin at Primrose

He liked best to be called Bob. The Primrose home where he was born on June 14, 1855, was a double log house built by his father near a spring not far from the road. The surrounding country is one of high hills and low valleys, mostly prairie land with some timber near the springs and brooks. Here Bob played in childhood and later enjoyed spending his spare hours reading, thinking, and giving play to his imagination. Some of his letters to me before we were married were written "By the Big Spring."

There was an "upstairs" to the log house. The two rooms below had the necessary furniture common to the homes of early settlers: the usual plain dishes, chairs, tables, and bedsteads with feather beds, as well as a good supply of quilts, woolen blankets, and coverlets. Some of these coverlets were woven by his great aunt and are still in family use. There was a chimney with a large fireplace, but the cooking was done on a kitchen stove with elevated oven. One feature, not so common at that time, was a bookcase with a few books which Bob's father treasured.

The house was always in order and scrupulously clean. The little mother was a woman of forethought, industrious, capable, generous, and hospitable, yet careful and saving. She was an excellent cook and skilled with her needle. Like Bob, she was fastidious about her person. Her dresses, though few and simple. were well made and becoming. The daily cold sponge bath was, even in log-cabin days, a ritual which she continued to the end of her life. Bob's mother, Mary Ferguson, had what her Scotch-Irish ancestors would have called the growing hand; seeds and slips came to life and flourished for her. In summer there were flowers in her garden, and she always found time to tend the plants which blossomed in her house throughout the long Wisconsin winters. To the end of her life, Bob and his sister Josephine shared this interest with their mother.

The father was an intelligent, determined man and a "good provider;" he disliked debt and was prudent in money matters—a man of integrity, high purpose, and strong will. His interest and ambition centered on making the four hundred acres he had acquired afford the advantages of a good home for his family, and education and a competency for his children....

The La Follette brothers were tall, handsome men, Bob's father being six feet two and three-quarter inches. He had a high forehead, luminous dark eyes, and thick wavy hair, with heavy beard and eyebrows. For a man of his height his hands and feet were small and slender. His wife, Mary, was only four feet ten. She was remembered by those who knew her as a very pretty young woman with clear, fair skin, light gold-brown hair, and blue eyes. She was of the sturdy type, though her arms were long and her hands slender. Sitting up—she always sat up very straight—she gave the impression of being much taller than she was. Physically, Bob resembled his mother more than his father, although he had a long stride, like a tall man, with grace and rhythm all his own. (Belle Case La Follette, *Robert M. La Follette.* Macmillan, 1953)

CARL SCHURZ, REFORMER

Carl Schurz was born in Germany on March 2, 1829. He grew up in the castle of the Counts of Metternich at Liblar, near Cologne on the Rhine; his grandfather was manager of the Metternich farmlands. A recent visitor to the castle was fascinated by the enormous St. Bernard, drooling in the sun as he watched over the castle



Carl Schurz, reformer

moat. He was known to the neighborhood children as "Charlie" after the immortal Schurz.

Carl's schoolmaster father had to scrimp to afford Carl's education. At the University of Bonn, 19-year-old Carl was caught up in the revolutionary spirit of the '48ers. He dreamed of a mixed and democratic Germany, freed from its Prussian overlords.

Young Schurz lived a life of romantic derring-do in 1848-1850. As a lieutenant with a price on his head in the rag-tag revolutionary army, he fled across the Rhine to France one jump ahead of the Prussian dragoons. While still on the wanted list, he reentered Germany and helped liberate his beloved university teacher, Professor Gottfried Kinkel, from the fortress-prison of Spandau near Berlin.

After two years as a refugee in France and England, Schurz sailed for America in 1852. He immediately launched his studies of the English language over which he later attained mastery. After a couple of years in the east, he decided that the west was the place for him. In 1854, he bought an 80-acre farm at Watertown. He tells of his arrival there in a letter to his wife on October 9, 1854:

> From Milwaukee to Watertown you have 17 miles of railway and 30 miles of "stage," which over the splendid "plank road" is not at all unpleasant. Wisconsin is a beautiful land, contrasting very favorably with the flat Illinois country by reason of its wooded hills and the multitude of its beautiful little lakes....Although one finds the borders of civilization so near at hand that in hunting one often encounters Indians, yet the southern half of the state is developing into a great, blooming, densely populated agricultural district.

Mrs. Schurz established the first American kindergarten, which still stands in Memorial Park on North 2nd Street, Watertown.

Carl Schurz quickly became a vigorous anti-slavery Republican and a supporter of Abraham Lincoln. Although his ambitions to become Lieutenant Governor of Wisconsin in 1857 and Governor in 1859 both foundered, his eloquent speeches in the 1860 presidential campaign played a significant role in Lincoln's victory.

President Lincoln rewarded Schurz with the Ministry to Spain in 1861. Homesick, he returned from Madrid in 1862 and was made a Brigadier General in command of a Union division.

After the war, Schurz moved to Missouri and served as U.S. Senator from 1869 to 1875. He showed independence from Republican party politics and put himself "above the play of merely personal and party interests." He sought to replace the spoils system with a civil service. He inveighed against the corruption of the Grant administration.

Upon the election of President Hayes in 1879, Schurz was appointed Secretary of the Interior. There he fought for fair play for Indians, protected forest lands against their despoilers, and nurtured the beginnings of a national park system.

The last 30 years of his life were spent in journalism, mostly in New York. He bitterly opposed his country's flirtation with imperialism in the Caribbean and the Pacific at the turn of the century.

In his later years, Schurz enjoyed the pleasures of nature—the blue waters, the forest trails, the clear vistas—at his summer home at Lake George, New York. He died on May 14, 1906.

Orator, reformer, statesman—Schurz defined the true patriot: "Our country, right or wrong. When right, to be kept right; when wrong, to be put right."

FRANK LLOYD WRIGHT, ARCHITECT

Frank Lloyd Wright was born in Richland Center on June 8, 1867. His mother, Anna Lloyd-Jones, had grown up on her family farm at Spring Green. Wright's father was an itinerant preacher, and the family moved around in New England during his boyhood. They returned to Wisconsin in 1879, and Frank studied engineering at the University of Wisconsin in 1885-86.

In 1887 Wright moved to Chicago and apprenticed himself to some of the great architects of the day—Louis Sullivan, Dankmar Adler, Daniel Burnham.

In the first decade of this century, Wright established the prairie school of architecture. Most of his buildings were in the Chicago area. These were low, horizontal, roomy family homes, expanding to the outdoors by means of terraces and porches. Wright was to repeat on a grand scale this form, seemingly emerging from the earth, in the Marin County Civic Center building north of San Francisco, which was finished after his death in 1959.

After the prairie period, there followed a quarter century mostly in the architectural wilderness, with architectural commissions few and far between. Wright spent much time in Germany, Italy, and Japan, where he built the earthquake-proof Imperial Hotel in Tokyo, 1915-1922. During this 1910-1935 period, he built Taliesin on the old Lloyd-Jones farm at Spring Green. The first Taliesin burned down in 1914, the second in 1925; the third stands there today. In 1934 he and his apprentices drove off to Arizona, where they built a winter Taliesin at Scottsdale.

In the mid-1930s, Wright's star rose again. The Johnson Wax Company building at Racine (1939) is a sky-lighted office building supported by tubular lily-pads of columns. The "Falling Water" house near Uniontown, Pennsylvania (1936) he daringly cantilevered over a waterfall. In this period, right up to his death, are the second generation of prairie houses near Madison, stressing simplicity and economy; the Guggenheim Museum in New York City (1959) with its spiral ramp to provide continuous space; the First Unitarian Church in Madison and the Greek Orthodox Church in Milwaukee. Along the Ice Age Trail, from Two Rivers to Middleton, Dane County, you will find a number of Frank Lloyd Wright structures.

Is it too far-fetched to argue that the Wisconsin Glacier influenced Wright? His prairie houses and the Marin County Civic Center, rising from the plain, might have been inspired by drumlins. The curved surfaces of the Johnson Wax building might well be the eroded side of an interlobate moraine. And the spiral ramp of the Guggenheim bears some relationship to a pothole worn into a rock by a glacial whirlpool.

ALFRED LUNT AND LYNN FONTANNE, ACTORS

Alfred Lunt and Lynn Fontanne were a very special pair of married actors. They seemed one being with two bodies, an effect often commented upon by theater people who watched them over the years.

In the 1920s, 1930s, and 1940s, they were also the embodiment of a particular ideal of witty, sophisticated thought and behavior, of suffering endured with grace and humor. Fellow-actor and playwright Noel Coward was one of their friends. Another friend, Robert Sherwood (the playwright and speechwriter for Franklin D. Roosevelt), once said in an interview, "It's really quite simple. I just write plays for the Lunts. All you have to do to have a Broadway hit is write a play in which there is a good part for Alfred Lunt and an equally good part for Lynn Fontanne."

Though the Lunts were the consummate personification of the Broadway and London West End theater, they differed from most successful actors in one striking way. When they left New York or London, they were to be found not out on Long Island, up the Hudson, or in Connecticut, but in Genesee Depot, Waukesha County, Wisconsin, where Alfred Lunt had lived a part of his childhood.

This rural retreat ties both of them directly to the Ice Age Trail, for the Trail loops through their country in Waukesha County. Their farm, Ten Chimneys, occupies land near the southernmost boundary of the Trail, the southernmost reach of the great glacier itself. Moreover, Alfred Lunt was an active member of the committee that started the action to create the Ice Age Trail.

For Alfred, Genesee Depot and the countryside were his boyhood roots. For Lynn, born and brought up in England, this was the real America, in contrast to the trans-Atlantic world of the English-speaking theater.

Ten Chimneys became one of the country retreats of a crowd of players, playwrights, producers, and other theatrical talent on the invitation of the Lunts.



Lynn Fontanne and Alfred Lunt, actors

They had one alarming experience there directly traceable to the effects of the glacier. They had long enjoyed swimming in a pond on the property. Lynn went out for a dip one morning to find the pond had vanished overnight. It just wasn't there anymore. The water had found its way through some subterranean leak in the glacial subsoil, and had gurgled happily away as the Lunts lay sleeping.

The countryside affected them in their work, too. Alfred did superb imitations of the birds around the house.

In their last play, Duerrenmatt's "The Visit," Lynn, as the wealthiest woman in the world, arrives in her native Swiss village and presently walks in the forest with Alfred, her first lover. They sit on a bench as they did long, long ago. Invisibly to the audience, a fawn runs before them. Suddenly, with absolute simultaneity, both point, arms straight out, toward the running fawn. At just beyond the center, their arms go up and over an invisible fallen log, and swiftly continue to the left side and drop. Unquestionably, they had performed exactly that act of communion more than once in the country around Ten Chimneys.

The Lunts are gone now, from the stage and from their Ice Age retreat. A plaque in the Genesee Depot town hall commemorates them.

THREE WOMEN OF THE GLACIER

This list of trailblazers of the Ice Age, sadly, concentrates on men. In this last section, the discrimination is repaired by recalling three women, all artists, whose origins were deep in Wisconsin's glaciers.

Recalling women as somehow relating to the snows of long ago is what Francois Villon was trying to do in his 15th Century "Ballad of the Lost Ladies:"

Prince, enquire not this week
Where they are gone, nor yet this year,
Save this refrain with you remain:
Where are the snows of yesteryear?

Ella Wheeler Wilcox (1850-1919), the poet, was a farm girl from Johnstown Center, Rock County, the southernmost point of the Johnstown Moraine which forms the end moraine of the Green Bay Lobe.

Her principal work, *Poems of Passion* (1883), was a mad success. Passion in the 1880s was less acceptable than in the 1990s, and Ella had to confess in the preface to her book: "I have received severe censure from my orthodox friends by writing liberal verses....This volume has cause much agitation throughout the entire country, and even sent a tremor across the Atlantic into the Old World....I yet feel compelled to follow the light which my own intellect and judgment cast upon my way."

A stanza from one of her poems of passion, "Delilah," gives you a sense of Ella's rhythms:

> She touches my cheek, and I quiver—
> I tremble with exquisite pains:
> She sighs—like an overcharged river
> My blood rushes on through my veins;
> She smiles—and in mad-tiger fashion,
> As a she-tiger fondles her own,
> I clasp her with fierceness and passion,
> And kiss her with shudder and groan.

Ella Wheeler Wilcox, poet



Zona Gale (1874-1938), the novelist, lived all her life in Portage, on the watershed between the glacial Wisconsin and Fox River systems.

Among those who early on urged her to become a writer was Ella Wheeler Wilcox. Ella, then at the height of her fame, patted the 8-year-old Zona on the head, told her she had talent, and urged her to "Keep on writing."

Zona Gale's finest novel, *Miss Lulu Bett* (1920), delineated the little tragedies of small-town life without blinking. The book became a best-seller, and several years later was made into the Pulitzer Prize-winning Broadway play.

Zona Gale was a Regent of the University of Wisconsin, a follower of the La Follettes in politics, and a lifelong worker for peace through the Women's International League for Peace and Freedom. Like Ella Wheeler Wilcox, in her later days she dabbled in the psychic: "There to me lies the supreme thrill—the signal from another planet."

As she said in her essay on her hometown, Portage:

> I have looked out on the Wisconsin River flowing at the foot of our lawn, at the Caledonia hills carving the sky-line, and have wondered if these are as beautiful as I believe them to be, and how a stranger would regard these. And now I wonder whether there is here involved a consideration not of emotion, not of the group soul—but rather of a new physics intimating that love-association does actually unveil properties and perhaps surfaces unknown to the sense of the casual passer-by.

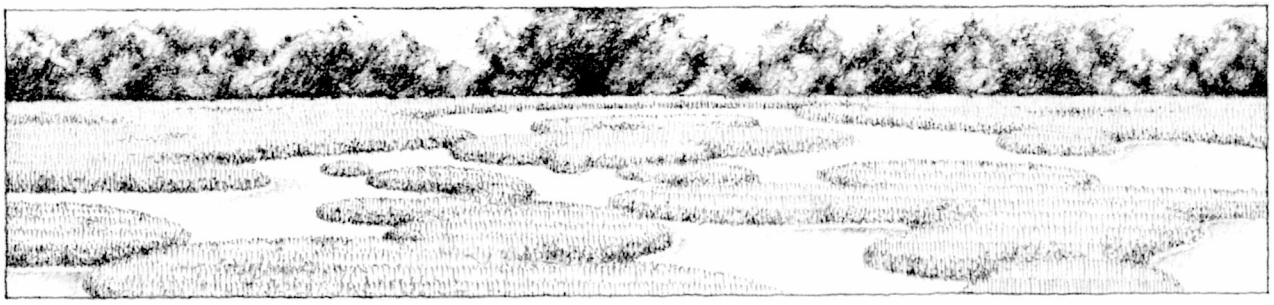
Georgia O'Keefe, the painter, born in 1887, spent her first 15 years in Sun Prairie, Dane County, in the heart of the drumlin country.

The Wisconsin countryside excited her interest in landscapes and still life, particularly flowers. She was painting pansies and roses before she was eight. After leaving Wisconsin, she lived in New York and later in New Mexico. Her oils and watercolors ranged from realism, such as her magnified flower, to abstractions in which simplified natural forms such as the skulls of cows were contrasted with vast colored masses or shapes.

Of her flower paintings, she wrote:

A flower is relatively small. Everyone has many associations with a flower—the idea of flowers. You put out your hand to touch the flower—lean forward to smell it—maybe touch it with your lips almost without thinking—or give it to someone to please them. Still—in a way—nobody sees a flower—really—it is so small—we haven't time—and to see takes time like to have a friend takes time. If I could paint the flower exactly as I see it no one would see what I see because I would paint it small like the flower is small....I made you take the time to look at what I saw and when you took time to really notice my flower you hung all your own associations with flowers on my flower and you write about my flower as if I think and see what you think and see of the flowers—and I don't.

CHAPTER FIVE



THE ICE AGE NATIONAL SCIENTIFIC RESERVE

These are the nine units of the Ice Age National Scientific Reserve:

1. Two Creeks Buried Forest

State Highway 42 and Manitowoc County Highway BB at Lake Michigan, near the Kewaunee County Line

World-famous among geologists for the data it provides on the fluctuations of the Wisconsin Glacier, it is the smallest of the units. A pine-birch-spruce-hemlock forest of an ancient interglacial period was not destroyed by the oncoming Wisconsin Glacier, but covered and preserved in layers of glacial clay, sand, gravel, and boulders. Later, Lake Michigan waves eroded the shore cliffs and exposed these layers.

A century ago Farmer Whittelsley wondered about the ancient wood he found as he dug his well. By carefully uncovering this ancient vegetation, scientists have acquired much knowledge about the most recent Wisconsin glaciation. Radio-carbon dating indicates this forest was living some 11,850 years ago, and that water much higher than Lake Michigan has inundated the area twice since the last glaciation. Plans for the area call for a dig to uncover the buried vegetation, and an exhibit to highlight it as it is. Interpretive facilities will show how the area has been altered by glaciers, where the plants have been found, and how and why the lake level fluctuated so markedly. The entire area is in public ownership. Acquisition was made possible through the generous purchase by Nature Conservancy, Wisconsin Chapter.

2. Northern Kettle Moraine State Forest

Between Glenbeulah on the north and Highway 28 on the south, in Sheboygan, Fond du Lac, and Washington Counties

A long wooded ridge runs north and south for 120 miles, in and between the Northern and Southern units.

Kames and eskers fringe it, kettleholes dimple it. The Kettle Moraine is an interlobate moraine, a great pile of glacial debris squeezed between the Green Bay Lobe and the Michigan Lobe of the Wisconsin ice sheet. An interpretive center is just off Highway 67.

This internationally known glacial feature was described in 1889 by T. C. Chamberlain, a former president of the University of Wisconsin and world famous glacial geologist. He explains the "kettle" metaphor:

The superficial aspect of the formation is that of an irregular, intricate series of drift ridges and hills of rapidly, but often very gracefully, undulating contour, consisting of rounded domes, conical peaks, winding and occasionally, geniculated ridges, short, sharp spurs, mounds, knolls and hummocks, promiscuously arranged, accompanied by corresponding depressions that are even more striking in character. Those that have most arrested popular attention are circular in outline and symmetrical in form, not un-

like the homely utensils that have given them names. Most of these depressions are not so symmetrical as to merit the application of these terms. Occasionally, they approach the form of a funnel, or an inverted bell, while the shallow ones are more saucer-like hollows and others are rudely oval, oblong elliptical, or are extended into trough-like, or even winding hollows, while irregular departures from all these forms are most common.

Next to the depressions themselves, the most striking feature of this singular formation is their counterpart in the form of rounded hills and hillocks, that may not inaptly be styled, inverted kettles. These give to the surface the irregularity sometimes fittingly designated 'knobby drift.' The trough-like, winding hollows have their correlatives in sharp serpentine ridges. The combined effect of these elevations and depressions is to give to the surface an entirely distinctive character.

The range itself is of composite character, being made up of a series of rudely parallel ridges, that unite, interlock, separate, appear and disappear in an eccentric and intricate manner. Several of these subordinate ridges are often clearly discernable. Ridges, running across the trend of the range, as well as traverse spurs extending out from it, are not uncommon features. This component ridges are themselves exceedingly irregular in height and breadth, being often much broken and interrupted. The united effect of all the foregoing features is to give to the formation a strikingly irregular and complicated aspect.

Two Creeks Buried Forest—11,000-year-old wood





Northern Kettle Moraine State Forest—Parnell Esker

3. Campbellsport Drumlins

Six miles west of the Northern Kettle Moraine Unit on State Highway 67, bordered by Fond du Lac County Highway Y on the south and V to the east, this unit is easily approached by means of State Highways 41, 45, and 67

Though not the highest or longest drumlins in Wisconsin (see Dodge, Jefferson, and Dane Counties for these), those of Campbellsport are concentrated in one convenient area. They offer a variety of perspectives on the hills themselves and how people have made use of them. Pioneers first turned the ax to the drumlin hillsides, using the timber for firewood, fenceposts, barns, and houses. The gentler sloping sides of the drumlins were used to plant crops, while the steeper slopes were left for livestock to graze. This unit offers an opportunity to make a scenic drive, with three overviews to spice a self-guiding tour route with

interpretive signs. Overlooks have been acquired for ten of the 60 eventual acres. Easements or zoning will provide scenic protection for 3,600 acres.

4. Horicon Marsh

State Highways 49 on the north, 26 on the west, 33 and 28 on the south

This unit is quite a different gift from the Ice Age to modern men and women and to modern wildlife. Located in Dodge and Fond du Lac Counties, 20 to 30 miles west of the Trail proper, Horicon Marsh is shaped roughly like an Indian arrowhead, with its point in the city of Horicon. The Marsh has some 30,000 acres. The northern two-thirds (20,933 acres) is Horicon National Wildlife Refuge; the southern one-third (10,899 acres) is the state Horicon Marsh Wildlife Area. No further land is needed, but an interpretive center is planned.

Both parts of the marsh are wildlife refuges and both permit regulated hunting and fishing. There is a great wildlife spectacle during the migratory seasons, when you can see Canada geese and uncountable wild ducks. Highway 49, across the northern end of the Marsh, is a favorite viewing place for waterfowl fans. Birdwatchers have spotted 265 species on the Marsh. It boasts a splendid heron and egret rookery.

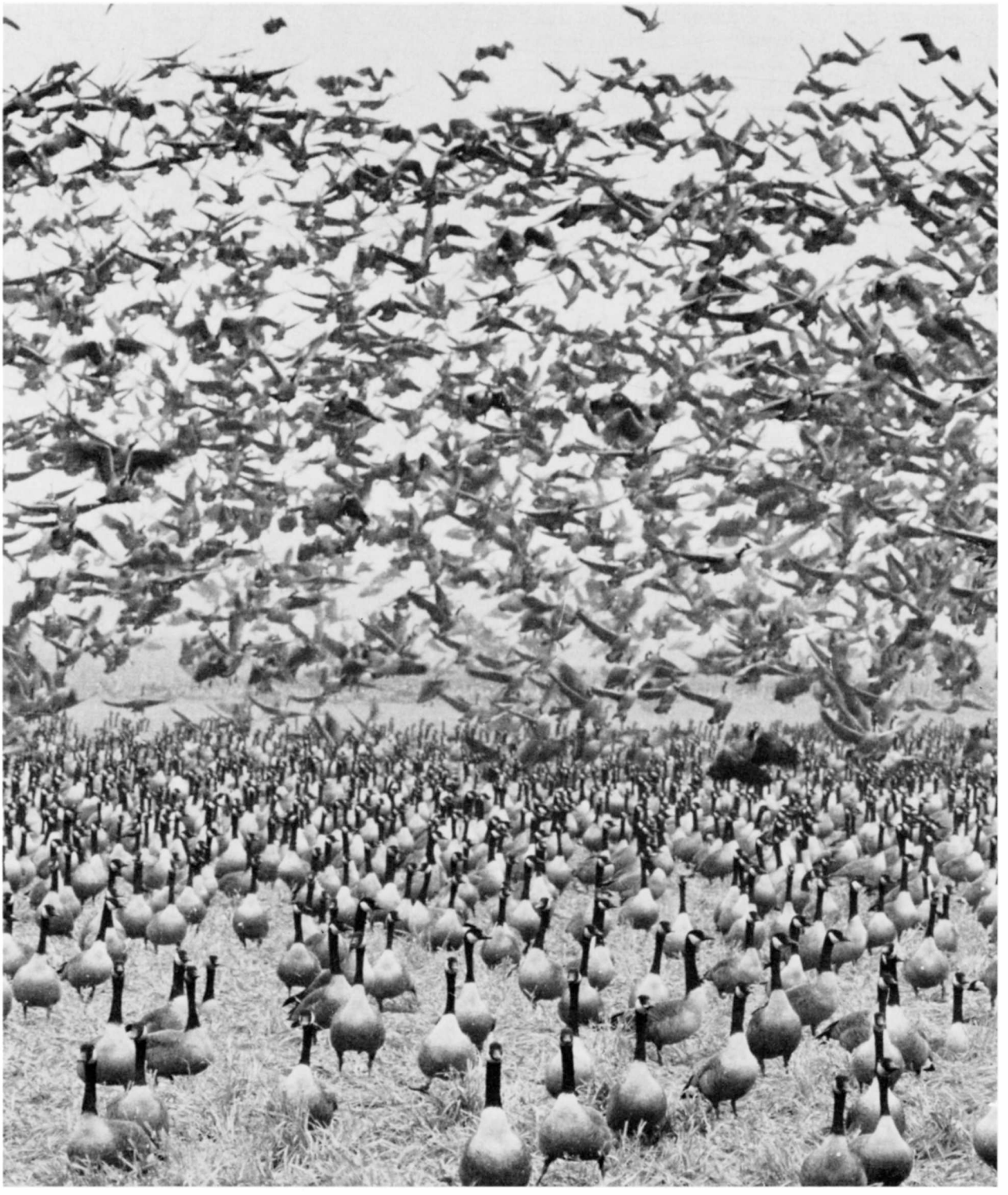
Horicon Marsh was created by the Green Bay Lobe of the Wisconsin Glacier, scraping out an egg-shaped depression about 14 miles long from north to south and three to four miles across. When the glacier retreated, this became a lake of some 50 square miles, surrounded by drumlins. But with post-glacial drainage, as the natural dike at the southern end weathered away, and with siltation from the Rock River, the lake became the marsh. Indian burial mounds still circle the marsh.

In 1846, with brush, logs, stones, and mud, the early settlers built a dam at Horicon to provide power for a sawmill and gristmill. Nine feet of water backed up behind the dam, forming a new lake reputed to be the largest artificial lake in the world. In 1858 two lake-edge farmers filed damage suits against the owners of the dam and won. Other suits followed, resulting in the removal of the dam in 1869. Once again the waters of the lake drained away and the area reverted to a low shallow marsh, which continued to attract large numbers of waterfowl. Better transportation, more sophisticated guns and ammunition, as well as improved marketing facilities encouraged commercial hunting. Each spring and fall, from the 1870s to the early 1900s, the market hunters shipped barrels of ducks to Milwaukee, where they sold for as little as 10 cents apiece.

Horicon Marsh attracted other business interests as well. Muck farming promised quick profits, and so special drainage interests petitioned the courts in 1904 to incorporate the marsh into a drainage district. The courts rejected the petition, but private landowners dug ditches on their own land, figuring that in this way they could reclaim enough land to make a practical demonstration of what the soil would produce. With this, local sentiment changed in favor of the

Drumlin in the Campbellsport Reserve Unit





Horicon Marsh—Canada Geese

completion of the work. A large ditch was dug from north to south down the center of the marsh (today known as the Main Ditch), with several smaller ditches running from east to west and feeding into it. The areas drained were then plowed, but poor drainage and lack of fertility caused this drainage venture to fail. Besides, the onions and carrots tasted like peat. To make matters worse, the exposed peat caught on fire and burned for years.

In 1921, conservation-minded individuals led by Curly Radke of Horicon began a fight to restore the marsh. In 1925 a petition signed by 115,000 people was filed with the legislature. In 1927, the Horicon Marsh Wildlife Refuge Bill was passed by the Legislature, providing $250,000 for land acquisition and $10,000 for building a dam in the City of Horicon. By 1946, the State had purchased the southern one-third of the marsh. During the 1940s, the U.S. Fish and Wildlife Service purchased the northern two-thirds of the marsh as a National Wildlife Refuge.

The renovation of the marsh started with the construction of the dam in 1930. Legal difficulties concerning the opening and closing of the dam followed, until final control for operation of the dam was vested in the then Division of Conservation in 1943.

The dam stopped the uncontrolled drainage through the main ditch. However, if the dam had held back enough water to wet all the desired areas, some portions would have become lake rather than marsh. So, after setting the water level at the most advantageous point, other means were found to expand the marsh wetlands.

The wetlands on the federal portion of the marsh were increased in 1948-1951 by the construction of an east-west dike. The water level north of the dike is maintained by a small water control structure located to the west of the point where the dike crosses the main ditch.

Today, Horicon Marsh is a combination of open water (averaging two feet in depth) and emergent aquatic vegetation consisting mainly of cattails and river bulrush. It is the nation's largest freshwater cattail marsh.

On the state area primary emphasis has been placed on managing for waterfowl. Management of pheasants and other game species is also of concern. Patches of corn are left standing for winter food on the upland areas. In addition, fields of tall dense grass are planted to provide safe cover for ground-nesting waterfowl and pheasants, to reduce next destruction by predators.



Cross Plains—Erratic on the end moraine

Made by the glacier, destroyed by man, and magically reborn, Horicon Marsh is a worthy unit of the Ice Age Reserve.

5. Cross Plains

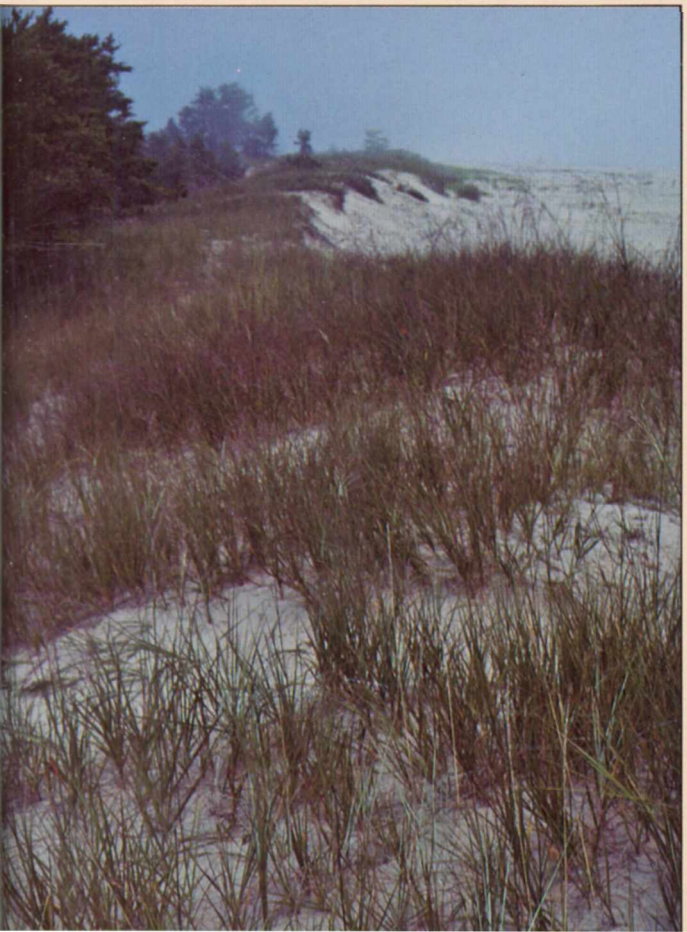
12 miles west of Madison on State Highway 14

Following the Ice Age Trail west, the next Reserve Unit is Cross Plains, an area that marks the most extreme venture of the glacier into the so-called "driftless" or unglaciated region. Here, some geologists contend, the glaciers never performed their gouging and leveling, and thus there remains an island of pre-glacial landscape. Jagged cliffs and towering bluffs mark an area which contrasts completely with the glaciated Wisconsin landscape.

The unit offers a typical section of the Johnstown Terminal Moraine, resting directly on the

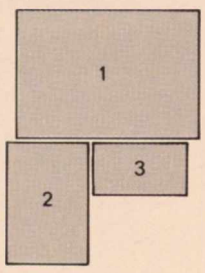
(Continued on page 73)



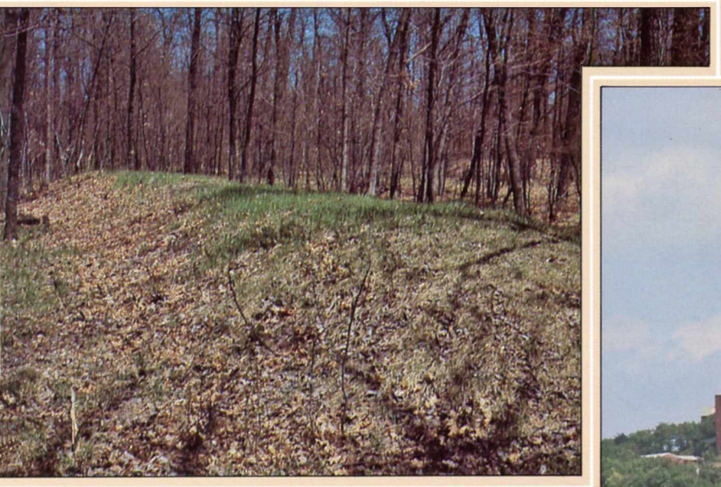




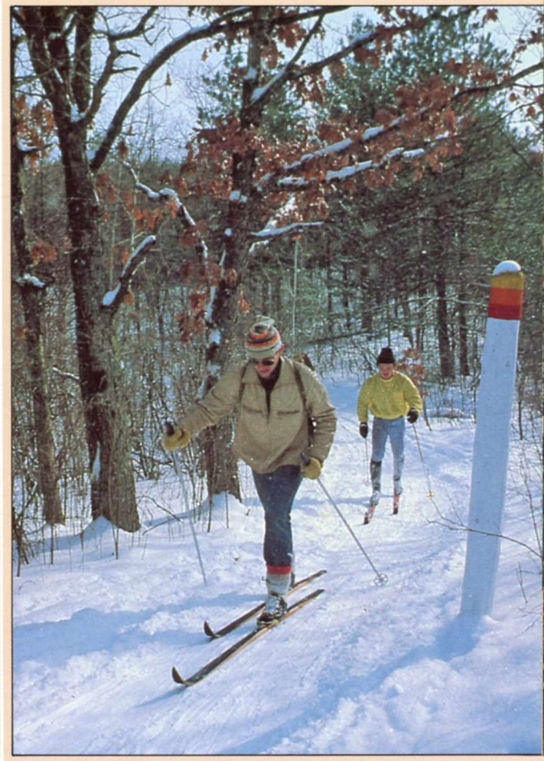
1. Potawatomi State Park (Door County) — Looking over Green Bay
2. Point Beach State Forest (Manitowoc County) — Shoreline of former glacial Lake Nipissing
3. Northern Kettle Moraine State Forest (Fond du Lac County) — Dundee kame

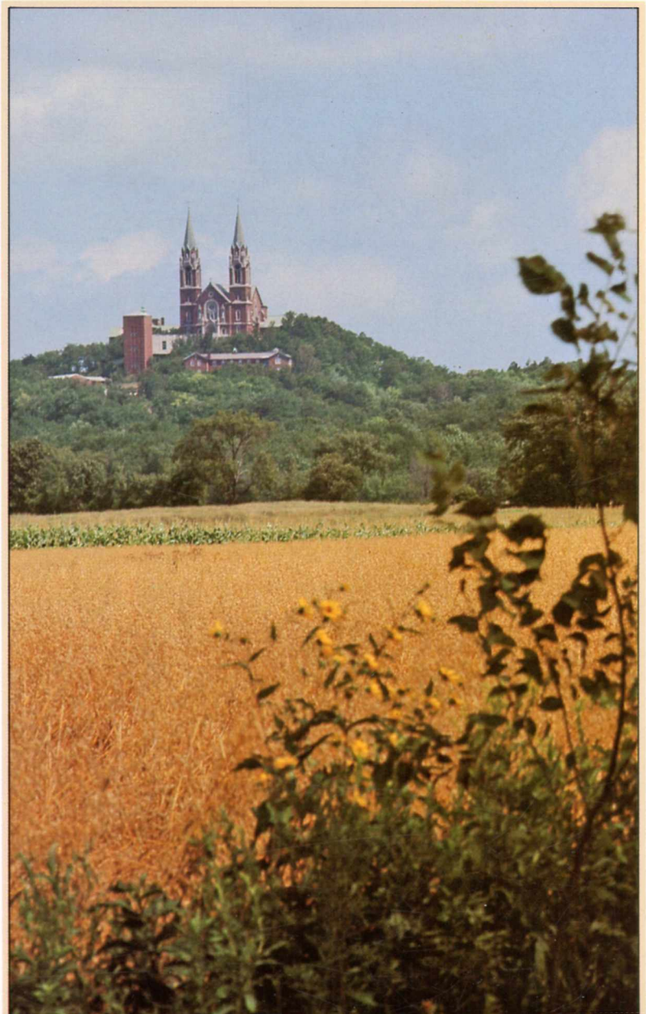




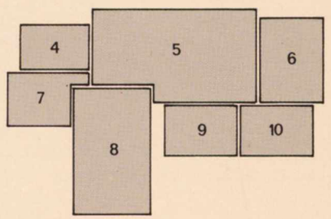








4. Glaciated terrain (Washington County) — From a balloon over the Trail
5. Horicon National Wildlife Refuge (Dodge County) — Canada geese in flight
6. Southern Kettle Moraine State Forest (Waukesha County) — Cross-country skiing
7. Lizard Mound State Park (Washington County) — Effigy burial mound

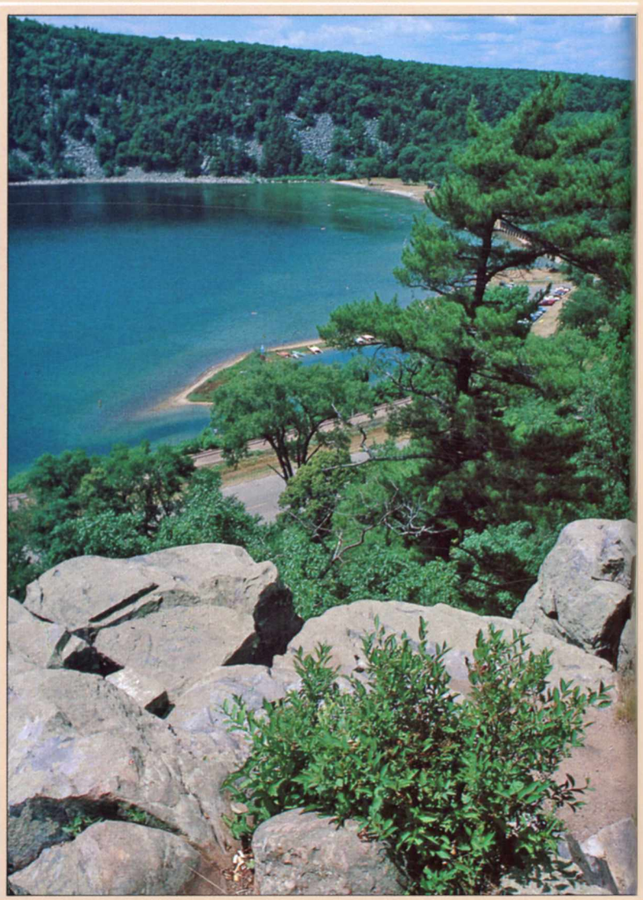




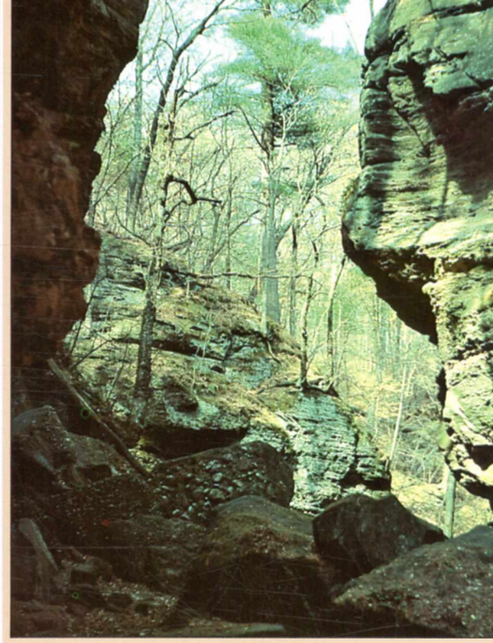


8. Holy Hill (Washington County) — Carmelite monastery on the moraine
9. Milton area (Rock County) — Abandoned railroad right-of-way
10. Mazomanie area (Dane County) — Biking through the autumn sumac



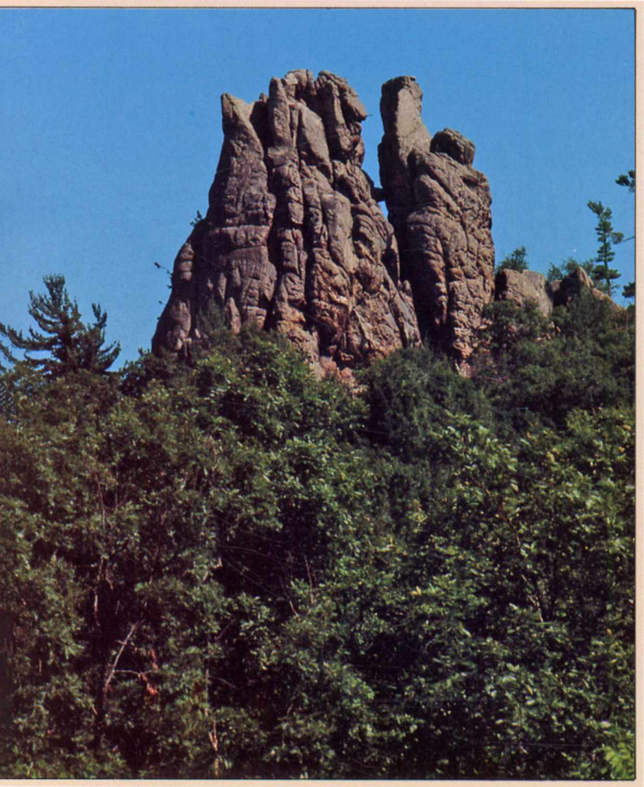


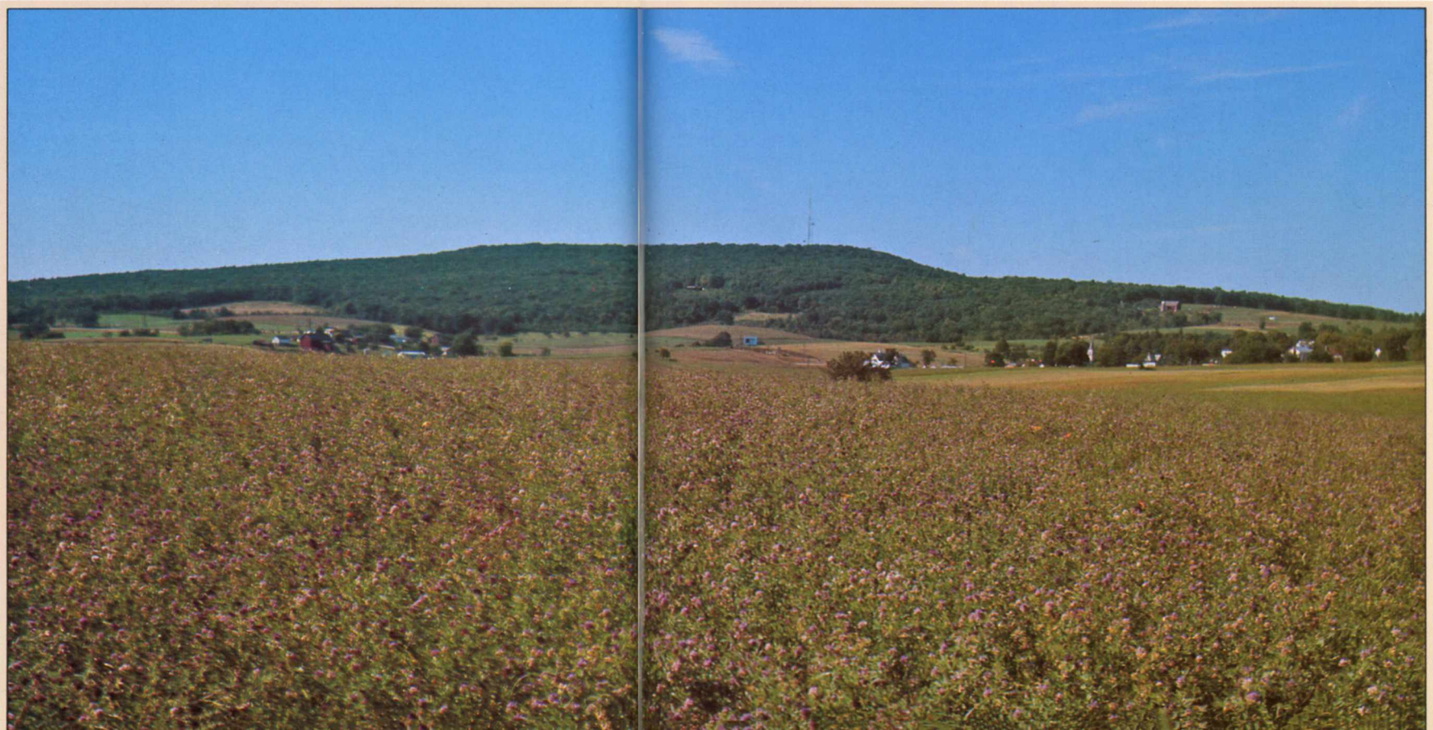




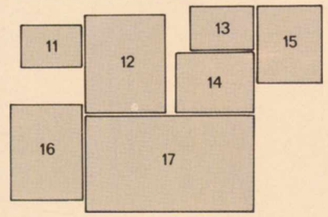


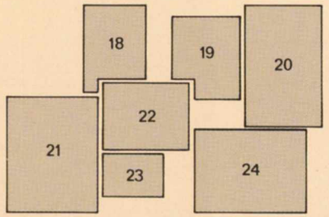
11. Fox River (Columbia County) — near Father Marquette's portage
12. Devil's Lake State Park (Sauk County) — Typical unusual rock formation
13. Stevens Point area (Portage County) — Erratic rocks brought in by the glacier





14. Red granite area (Waushara County) — Lake in former quarry
15. Parfrey's Glen (Sauk County) — Scientific area
16. Dodgeville area (Iowa County) — Typical unglaciated scenery
17. Blue Mound State Park (Dane-Iowa Counties) — Pre-glacial monadnock along the Biking Trail



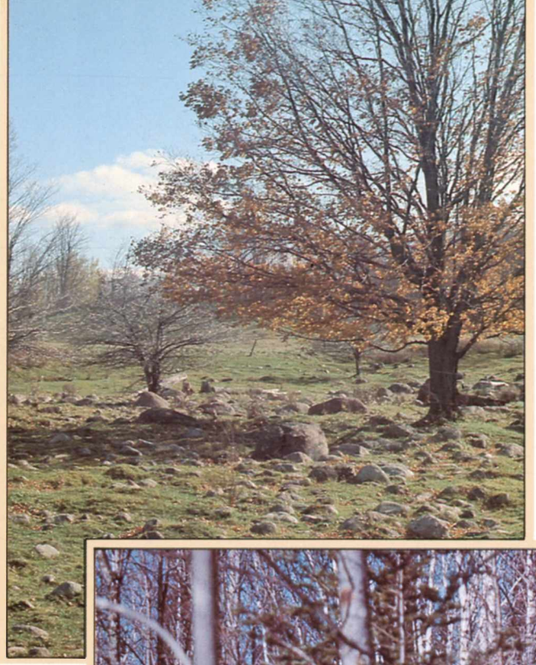


18. Antigo area (Langlade County) — Glacier boulder train

19. Chequamegon National Forest (Taylor County) — Trail maintained by Forest Service

20. Parrish Hills (Langlade County) — Along an old lumbering road

21. Eau Claire Dells County Park (Marathon County) — Dells of the Eau Claire River









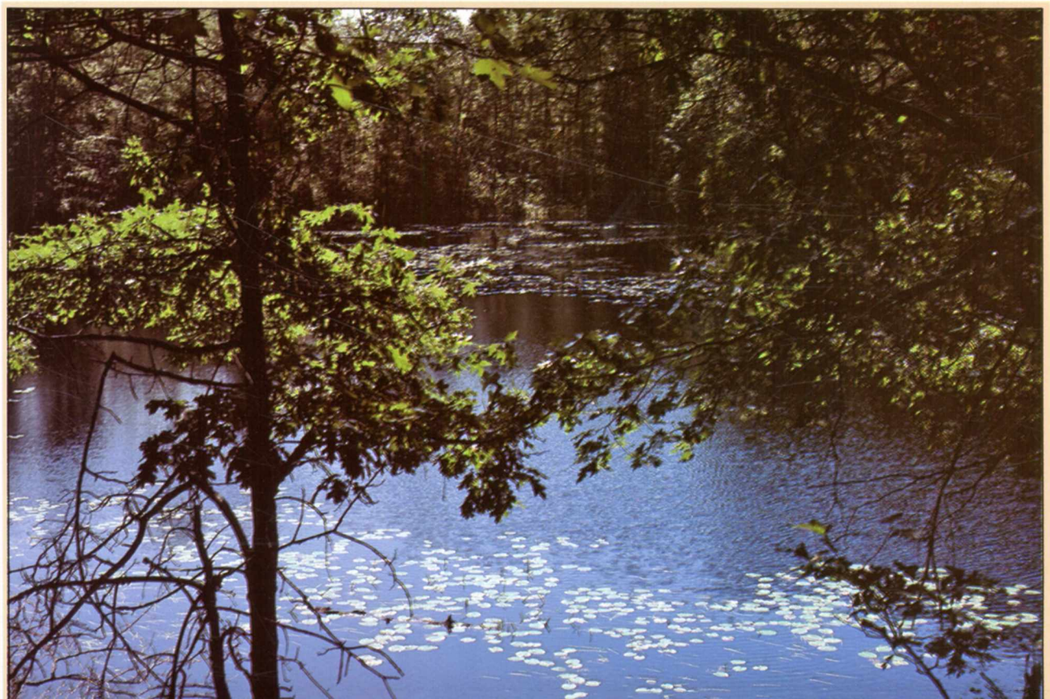
22. Near Irma (Lincoln County) — Winter in the Northern Highlands

23. Highland Lakes area (Langlade County) — Over the beaver dam

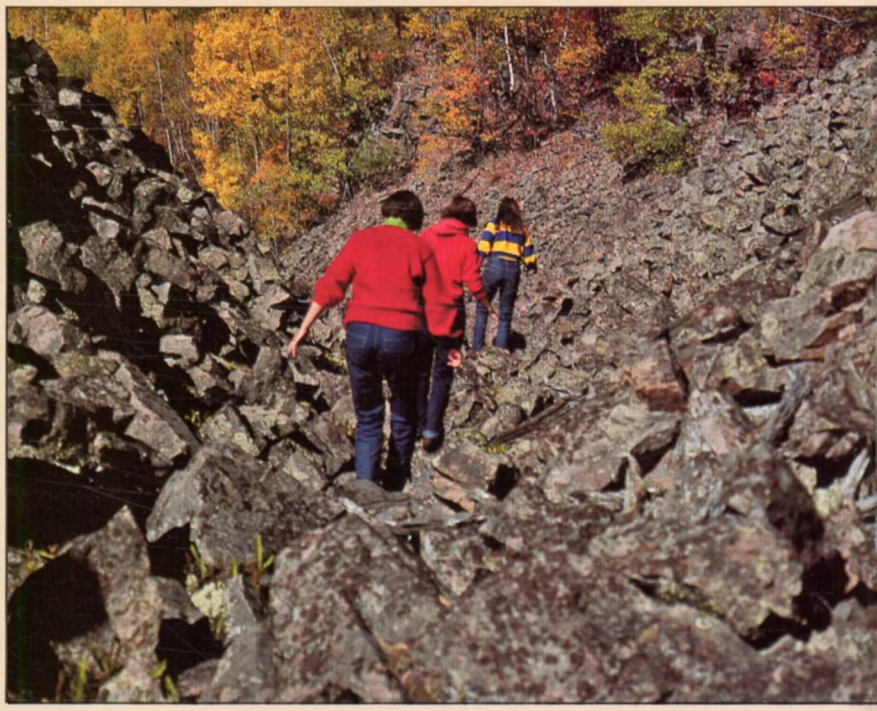
24. Bloomer area (Chippewa County) — Glacial kettle lake



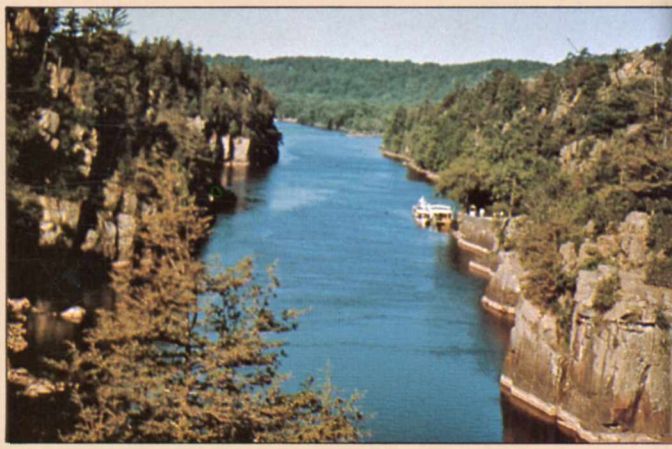










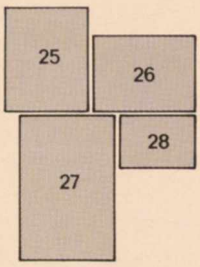


25. Balsam Lake area (Polk County) — Tubing down the Apple River

26. Weyerhauser area (Rusk County) — Blue Hills talus slope

27. St. Croix Falls (Polk County) — Pothole Trail in Interstate State Park

28. St. Croix Falls (Polk County) — Gorge of the St. Croix River



(Continued from page 64)

weathered dolomite bedrock. Along the moraines are many small glacial lakes.

An interpretive trail is planned to permit visitors to glimpse the end moraine, sculpted limestone formations, and glacial spillways. One hundred of the planned 160 acres in fee ownership have been acquired.

6. Devil's Lake State Park

Between State Highway 113 and U.S. 12

North of Cross Plains is the most popular Wisconsin state park and a dramatic example of glacial activity. Here the Wisconsin River cut a gorge more than 800 feet deep through the ancient quartzite of the Baraboo Range. There is good evidence to indicate the original canyon dates back to Precambrian time. It is likely that the valley was partly filled and re-excavated several times.

During the final stage of the Wisconsin glaciation the Green Bay Lobe nearly covered the northwest side of the South Range. Meltwater and tons of glacial debris filled the gorge nearly half full and a moraine formed in each end of the valley, creating the basin which is occupied by Devil's Lake today. The size of the glacier can be comprehended if one looks to those morainal dams and observes how the mighty Wisconsin River has been rerouted nine miles to the east.

Other Devil's Lake landmarks are rocks weighing many tons which have obviously been moved uphill, large potholes drilled into solid rock by glacial abrasive action, and freestanding monumental rock formations—looking like modern sculpture—which were whittled free of the nearby rock ridge to which they once were attached.

More than 1.5 million people arrive yearly to use Devil's Lake's 450 campsites, hike the trails, swim, fish, or sail. Interpretive exhibits are presently in service to explain its geological history.

Chippewa Moraine—Ice block lake



Naturalist programs are offered, along with guided tours. Information is available at the Park Headquarters at the lake's north end. A new interpretive center is also in the works.

7. Mill Bluff State Park

Off I-90-94

Less famous but no less spectacular than Devil's Lake is the Mill Bluff Unit in Monroe County. Towering rocky buttes or mesas rise abruptly from the nearly level plain of extinct Glacial Lake Wisconsin, which once covered more than a million acres of the state. The buttes are stubborn residual remnants of the Cambrian sandstone—the bedrock for much of this part of Wisconsin. They owe their nearly vertical sides to continuous wave action when they were rocky islands in Glacial Lake Wisconsin. From the tops of these sandstone spires are matchless views of the extinct lake bed and neighboring bluffs. Trails are being improved. Of the planned 930 acres, 610 are already in public ownership.

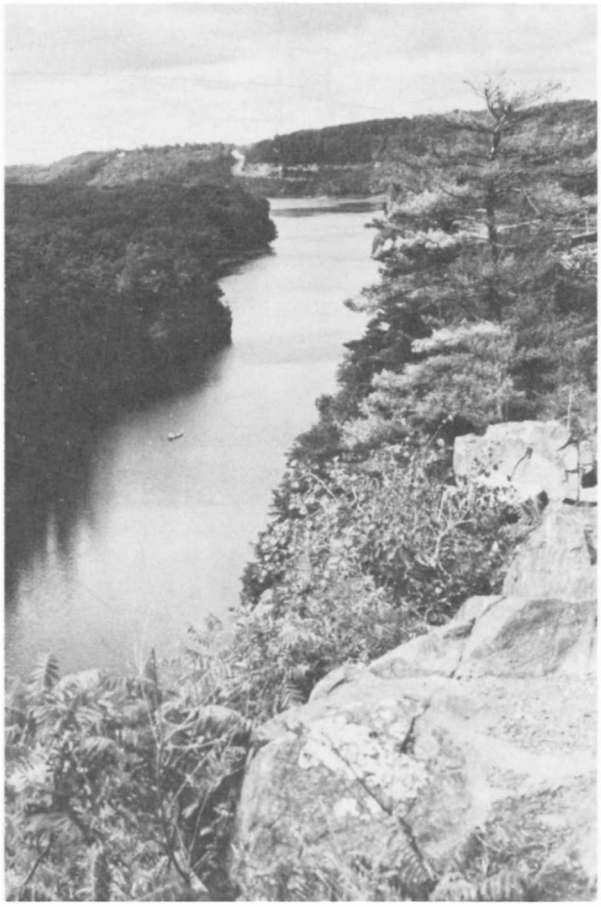
8. Chippewa Moraine Unit

County Highway M east of State Highway 40, six miles north of Bloomer, Chippewa County

In the heart of northwest Wisconsin is the eighth Reserve Unit, the Chippewa Moraine. This unit was formed by the advancing Chippewa Lobe of the Wisconsin glacial epoch. It stands above the surrounding cultivated plains, with more than 300 lakes and ponds set in a forest of jumbled hills.

Unlike the higher hills of the interlobate Kettle Moraine in the southeast, the features of the Chippewa Moraine are characterized by the gentler hills of "dead-ice" moraine. As the ice stopped moving, fissures criss-crossed its surface. Debris carried along in melt-water filled many of the cracks, forming a wide variety of sharp ridges. Blocks of ice were covered with debris. When the ice melted, many small shallow kettles were formed, producing the area's curious knob and swale landscape. Ice-walled lake plains—flat-topped areas formed by interglacial lakebeds—are peculiar to the unit. The unit also has several kames and an esker.

Much of the Chippewa Moraine Unit is presently county forest, with opportunities for hiking and other recreational activities. The rest is private land under acquisition. An interpretive center is planned for 1991, stressing an explanation of the peculiarities of "dead-ice" features. Hiking trails are under construction, and a self-guiding auto and bike tour is also contemplated. Of the planned 2,940 acres, 1,832 are already in public ownership.



Interstate State Park—St. Croix River gorge

9. Interstate State Park

Polk County, at the intersection of U.S. Highway 8 and State Highway 87

Furthest west of the nine Ice Age Units is the Interstate State Park.

The St. Croix, or Holy Cross, River forms the Wisconsin-Minnesota boundary above the Mississippi for three-fourths of the way to Lake Superior. *Dalles* is French for "flagstone" and in geography refers to river rapids that pass over similar flat, smooth, rock surfaces, especially, as here, between high walls of Precambrian basalt. In 1900 Wisconsin made the Dalles of St. Croix

its first state park. Minnesota created a park on its side of the River, and the two constitute Interstate Park.

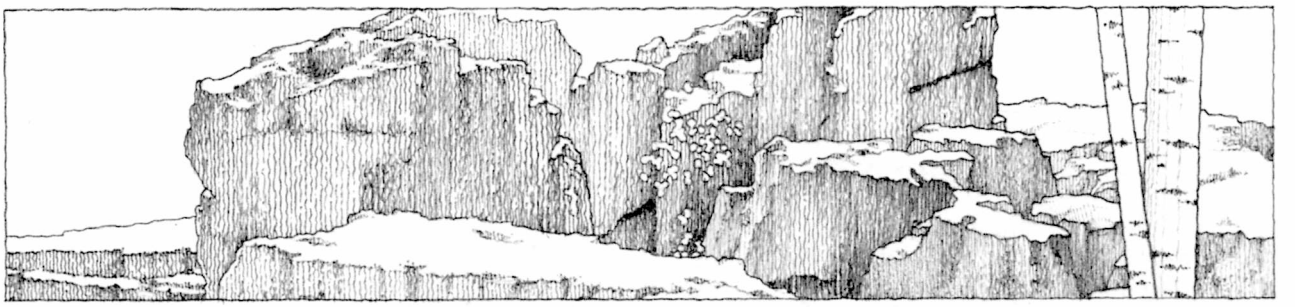
This Minnesota-Wisconsin border area has a volcanic background. Residues of ancient lava flows, large water-formed potholes in the hard lava, and a scenic 100-foot deep gorge, once a prime glacial drainway, highlight the Park. Its landforms evidence the tremendous erosive force of glacial melt-waters. At St. Croix Falls, the river used rock as its tool to carve a narrow, steep-walled gorge through layer upon layer of sandstone and lava, while thundering down the gorge-fashioned whirlpools. Lake O' the Dalles, which is in the unit, was once a huge whirlpool.

The park has an authentic Echo Valley, with looming cliffs of basalt blocks. Potholes one the Minnesota side of the park are as deep as 60 to 80 feet, and 15 to 25 feet in diameter. Basalt blocks form such rare features as the Devil's Chair, Turk's Head, and the famous profile face, The Old Man O' the Dalles.

Three campgrounds, swimming, and more hiking trails along the beautiful St. Croix make this a jewel on the Ice Age Trail necklace. An interpretive center opened in 1981 tells the story of the Lake O' the Dalles, potholes, and the role of the drainage way. Park headquarters has trail information. All 920 planned acres are in public ownership.

Northern Kettle Moraine State Forest—Butler Lake





THE ICE AGE TRAIL

The Ice Age Trail has three beings—for road bikers, for motorists, and—most important—for hikers. This chapter delineates the three routes as they appeared in mid-1990.

THE BIKING TRAIL

The biking trail closely parallels the Ice Age National Scenic Trail all the way, thus providing the biker with easy access to all the sights of the hiking trail. For the bike trail we recommend the two handy official bicycle maps obtainable from the Wisconsin Division of Tourism, Department of Development, 123 W. Washington, P.O. Box 7606, Madison, Wisconsin 53707. These excellent maps, the Eastern and Western Wisconsin Bicycle Escape Guides, display green "Recommended Routes" and "Off-Road Bike Paths" that comply with reasonable safety standards. The following general itinerary from Door County to Polk County will enable you to find the appropriate green routes for the Ice Age bicycle trail from these two maps:

Starting at Potawatomi State Park, follow the Ahnapee trail to Algoma, then skirt the Lake Michigan shoreline to Manitowoc, just north of Sheboygan turn west to Elkhart Lake, then south through the Northern Kettle Moraine State Forest to the Washington County line.

From the Washington County line bike south on Kettle Moraine Drive, west on Washington County D to County W, south on County W, then through Pike Lake State Park, Monches, North Lake, Stone Bank, Nashotah, Delafield, crossing over I-94 on Waukesha County C, through the Southern Kettle Moraine State Forest and then south to junction of Walworth County's Pinnow Road and Townline Road, northwest north of Janesville to junction of Rock County M and Eagle Road, south through Footville and Orfordville to Brodhead at Rock-Green County line, then follow Sugar River State Trail to New Glarus, north through Mt. Horeb and Mazomanie to Dane County Y, east on Y and V, then north through Lodi to Merrimac Free Car Ferry.

From the Merrimac Ferry bike north through Devil's Lake State Park and Baraboo to Levee Road, east on Levee Road to Portage, north through Montello, Harrisville, Westfield, and Coloma to Hancock, north on Waushara County B to Plainfield, east and north on Portage County D, north on D, A, and Q to Grayson Road, west on O and Old Highway 18 to Stevens Point, north on Y across Marathon County line through Hatley and Hogarty in Marathon County to Antigo in Langlade County, northeast to Lily, west through Summit Lake and Parrish to Tomahawk, south on Highway 107 to Council Grounds State Park, west on Lincoln County F to Taylor County line.

From the Lincoln-Taylor County line, bike west on Taylor County O, E, A, and F to Chippewa County, east on Chippewa County S, north on EE through Cornell, north on CC to M, west on M to E, north on E into Rusk County, west on Rusk County D through Island Lake to Chetek, north on Barron County M to Brill, west on V and B through Haugen to Cumberland, west on Polk

County G and I through Balsam Lake and Centuria to Interstate Park.

As you will see, Waupaca-Portage Counties (Map 12, p. 107) and Langlade County (Maps 14-18, pp. 109-113) have their own additional bicycle trails.

A side trail will shortly (inquire at Waukesha City Plan Commission, (414) 549-8085) connect the Ice Age Trail with Wisconsin's two largest metropolitan areas, Milwaukee and Madison. From Milwaukee County's Greenfield Park, at W. Greenfield Ave. and 124th St., which in turn is connected with the county's bicycle trail system, the Milwaukee-Waukesha connector goes west on the Waukesha County New Berlin Trail to Pearl St. on the east side of the city of Waukesha, at whose western edge, on MacArthur Road, it picks up the Glacial Drumlin State Trail which runs all the way to Cottage Grove just east of Madison. Through the Waterville junction, the Glacial Drumlin Trail gives hikers and bikers from Milwaukee and Madison direct access to 1,000 miles of hiking and biking Ice Age trails.

Bicycle safety is a matter of survival, as any experienced cyclist knows. You are ultimately responsible for your own safety, and safe riding habits should be second nature to you.

Familiarize yourself with all traffic regulations and pay particular attention to the following suggestions.

- Outer clothing must be bright, highly visible.
- Check for traffic at all intersections. Even if you have the right of way, be prepared to yield it.
- Ride single file as far to the right as road conditions permit. Obey all traffic signs.
- Use hand signals when turning or stopping to inform motorists and fellow cyclists.
- Don't tailgate other bicyclists. Stay alert for the sound of motorists approaching from behind and ride straight and steady as they pass.
- Use a light beginning at dusk.

If you are leading a group insist that all members follow the rules. In group situations the last rider has the responsibility of informing those ahead if a vehicle is approaching from behind.

Have some knowledge of first aid and pack a first aid kit with a good supply of large bandages for abrasions.

A very strong wind from the left can create a hazardous situation. You will tend to steer to the left to compensate, and if a close passing vehicle breaks the air pressure, it will cause you to swerve. Pulling to a stop off the road when a vehicle approaches is recommended.

Railroad tracks should be crossed at as close to a right angle as possible. Tracks are extremely slippery when wet and it is advisable to walk across in such a case.

Braking should be done smoothly with both brakes. When slippery leaves, loose gravel, or sand are encountered, only the rear brake should be used until these obstacles are cleared. On a rainy day allow *4 to 5 times* the distance for stopping.

Dogs that chase bikers are a problem; watch for them as you approach farmyards. If a dog runs into the road after you, slow to a stop and command the animal to *stay*; follow this up with *go home*. Make sure all members of your group are familiar with this procedure. In the event that these methods don't work, you may equip yourself with a commercial dog repellant. Never pursue a dog onto private property; you are only within your rights on the roadway.

If you are bitten by a dog, report the incident to the County Sheriff's office with full details, including your home address. They will have to impound the animal if it has not had its rabies shots, and you should get a tetanus booster as soon as possible.

Fatigue can be your enemy if it affects you to the extent that you are not fully in command of your riding abilities. Stop and rest a few minutes if you feel yourself losing control.

THE MOTORIST'S TRAIL

Motorists can closely follow the Ice Age Trail and its glories by selecting their own route, using either the two bicycle maps referred to above, or the annually published Wisconsin Road Map, both available through the Wisconsin Department of Transportation, 3617 Pierstorff St., Madison, Wisconsin 53704. Also highly recommended is the Wisconsin DNR's monthly magazine, *Wisconsin Natural Resources*, available by mail through P.O. Box 7191, Madison, Wisconsin 53707.

The state has set aside one drive, the Kettle Moraine Scenic Drive, expressly to display for the motorist the Wisconsin glacial heritage. The Drive, identified by green acorn-shaped road

signs, runs for a hundred miles over little-used rustic roads from Highway 23 in the Northern Kettle Moraine State Forest to U.S. 12 in the Southern Kettle Moraine State Forest.

Summer is the most popular time for a visit to the Kettle Moraine, with six family campgrounds, four supervised swimming beaches, and numerous fishing opportunities. Spring and fall are the best times for bug-free hiking. Cross-country skiing is excellent. Nature walks and visitors' centers unfold the natural history of the Ice Age. Be sure to stop at Old Wade House, Holy Hill, Lapham Peak, Old World Wisconsin, and Paradise Springs Nature area. Detailed maps and information can be obtained at state forest and park headquarters along the route.

The Wisconsin Department of Development, P.O. Box 7606, Madison, Wisconsin 53707, furnishes *Wisconsin Auto Tour Escapes*, a guide to circle routes. Among the numerous tours that include Ice Age visits are 10—Door Country, 15—Northern Kettle Moraine and Horicon Marsh, 19—Holy Hill, 20—Southern Kettle Moraine, 18—End Moraine, 14—Devil's Lake, 5—Lumberjack Country, 4—Blue Hills, and 3—Interstate Park.

THE HIKING TRAIL

The 22 maps that follow for the hiking and cross-country skiing trail—the Ice Age National Scenic Trail—are adapted from the Wisconsin County series, scale 1/125,000, 1 inch = 2 miles, except where otherwise indicated. Solid dots—•••—indicate existing hikeable Trail—either officially certified by the National Park Service as completed (221 miles in mid-1990); or where an application for such certification is pending; or where, though such an application has not yet been made, the trail is reasonably hikeable. Trail planners envisage marking connecting road segments of the Trail, so as to permit continuity. The corridor for the entire Trail of a thousand miles is shown on the map on the back cover.

If this guide is too bulky to carry, you can make a photocopy of the particular map segment you need.

The hiking trail description, with its maps, proceeds from Door County on Lake Michigan to Polk County on the Minnesota border. Those who elect to go the other way should simply read the route in reverse.

Wisconsin has no mountains, unless you count the rock faces at Devil's Lake, so the hiking trail is not particularly demanding.

The Potomac Appalachian Trail Club, 1718 N St. N.W., Washington, DC 20036, publishes the helpful *Hiking, Camping, and Mountaineering Equipment*, listing sellers and their locations. The U.S. Geological Survey topographic maps, now completed for all Wisconsin, are obtainable from the Map Department, U.S. Geological Survey, Box 25286, Denver Federal Center, Denver, Colorado 80225, and from Wisconsin Geological and Natural History Survey, 3817 Mineral Point Road, Madison, Wisconsin 53705.

HIKING ALL THE WAY

Three times the Ice Age Trail has been hiked for all its 1,000 miles. There will be more, as the Trail becomes increasingly off-road and thus more interesting.

Jim Staudacher, then a 20-year-old Marquette University student and now a Whitefish Bay police officer, was the first to make the trek. His 1979 hike took 81 days, from May 14 to August 2. Along the way, he had an eyeball-to-eyeball confrontation with a black bear near the Shelter No. 2 in the Northern Kettle Moraine State Forest; barely dodged a bolt of lightning near Branch in Manitowoc County; and narrowly escaped a tornado along the Sugar River in Green County. But he did conquer the 1,000 miles, and felt fulfilled.

The second team was Mr. and Mrs. Kenneth F. Waraczynski of Milwaukee, who did it over a period of years, from 1983 to 1988. Their report greatly assisted trail volunteers in repairing neglected sections of the Trail.

The third all-the-way hiker was the Rev. Harry J. Gensler, S.J., philosophy professor at Loyola University, Chicago. He had previously hiked the 2,023-mile Appalachian Trail from Maine to Georgia, the 2,572-mile Pacific Crest Trail from Mexico to Canada, and the 400-mile Bruce Trail in Ontario. He started on May 17, 1983, the 310th anniversary of the day his fellow Jesuit Father Marquette left St. Ignace, Michigan, on his way to the Mississippi.

Father Gensler's report of June 30, 1983, written ten days after his return, is an invaluable guide for long-distance hiking:

Let me say a bit about certain aspects of the trip, especially certain problem areas.

Weather and Bugs: These have been the twin curses of all my long hikes. Spring this year had been cold and wet, and this carried into the first half of my journey. It seemed to rain almost every day—sometimes very hard and combined with cold and high winds—the worst conditions for hypothermia. My equipment held up, but at times just barely. The second half of the journey was generally sunny and warm, with only a little harmless rain now and then (surprisingly my only frost came during this period, on a clear night followed by a warm-sunny day). But in this second half of the journey I was cursed by swarms of mosquitoes (together with ticks, biting flies, and gnats), especially in the deep woods. I found repellent to be ineffective when the bugs got really bad; then I would resort to the full cover-up treatment: long trousers, long sleeves, mosquito head net (a *must*), and fingerless gloves (to provide dexterity and yet protect the hands). Hiking in hot weather dressed this way is not at all fun; you feel hot and sweaty and dirty all day and can remove your protective shield only at the cost of being attacked immediately by dozens of bugs. Toward the end, the continued sunny hot weather reduced the number of bugs. For anyone else considering doing the trail, I would recommend planning the trip for later on in the summer or early fall, to avoid the peak bug season.

Camping: I had little problem camping when I was hiking over a footpath—to set up my tiny one-person tent I needed only a small amount of fairly level dry ground—at times the footpath itself served this function. Camping was more difficult when I was hiking on the long road sections through mainly farming country; then I would try to camp at a campground of some sort or at least on public land (e.g. public hunting and fishing areas)—but if this were not possible I would just find a group of trees some place where I would not be noticed (I never made fires and I made minimal impact on the places where I camped). Most of my campsites were poor—few had water or much scenic value. My best campsites were generally in pine groves.

Food: I got all my food from grocery stores which were fairly plentiful except in certain sections. Generally any town printed on the official Wisconsin State Map, except those printed using the smallest type, could be relied upon to have a grocery store. When I got scientific about it I would, upon arriving at a grocery story, multiply the number of miles to the next sure grocery store by the number of ounces per mile that I have been eating (1.2), subtract the number of ounces already in my food sack (estimated or weighed at the store scale), and buy about that many ounces of food. The longest stretch between grocery stores was 110 miles, between Antigo and Tomahawk; most stretches were much less. To save weight and bother, I didn't do any cooking; I would eat things like peanuts, raisins, crackers, cookies, bread, granola, granola bars, instant drinks, etc. I lost about 15 pounds on the trip.

Water: Until Langlade County, I got almost all my water from civilized sources (parks, campground, gas stations, stores, bars, homes, etc.); I would fill up my two water bottles (2 quarts totally) once or twice a day. After Langlade County, in the more isolated sections, I got a lot of my water from streams and lakes, purifying the water using my Walbro water filter followed by the chlorine treatment (2 drops of Clorox per pint, shake bottle with cover on loosely enough for some water to escape, wait 30 seconds); either method by itself should have been adequate to kill microorganisms.

Problems: On road sections, hundreds of barking dogs tried to intimidate me—two of the dogs were quite vicious and scared me half to death; generally I would scream "Go home!" if a dog got too close—if he didn't back off then I would squirt him with my water bottle (an effective technique—they are very afraid of this!). Two nights I was kept awake by bear noises (but in neither case did the bear get my food). I only saw a couple of snakes—no problems here. I had two equipment problems: my air mattress developed a leak that I couldn't locate to fix (so I sent it home and bought a foam mattress); and my squeeze water bottle was chewed apart one night by some animal (so I bought a plastic squeeze bottle filled with maple syrup and then threw away the syrup). Physically, I held up pretty well—although there were days of low energy. I did have some foot problems (blisters, etc.) and my ankle started swelling and becoming rather painful to walk on the last two days (at that point I had doubts that I would finish). But the most important problem of this or any long hike is psychological—when things seem especially bad (e.g. you are wet and shivering) you need the conviction that the whole thing is worth doing and the inner strength to carry through on this conviction.

Cost: While on the actual 1,000-mile hike during these 33 days, I spent a total of $205.96—including $175.16 for groceries and $30.80 for other things (a new sleeping pad, three pairs of sox, shoe laces, an ankle brace, laundromats, and postcards). I spent nothing at restaurants or motels or campgrounds; I tried to see how cheaply I could hike if I really wanted to—most people would want to live a bit more lavishly. The figure for the cost of the trip would be about double if I added transportation from and to Chicago and the amount spent during a four day stay at Interstate Park after the hike.

Speed: My 1,000-miles in 33 days works out to a 30 miles-per-day rate. I walked this fast because I am in excellent physical condition (despite being 38 years old), carry a light pack, wear light shoes, and like to walk all day without doing things like fishing or taking pictures. Practically no one else goes as fast as I do. Probably most people doing the whole trail could

want to take two months or more and hike at a 10-15 miles-per-day rate.

Equipment: My equipment was extremely light—the loaded backpack, without food and water (which would add only a few more pounds),weighed just under 15 pounds. Most backpackers would carry over twice this weight. Let me give my equipment list:

Wear (minimum): Short sleeve polypropylene shirt, nylon running shorts (with pockets added for wallet and handiwipe/handkerchief), two pairs of sox, walking shoes, glasses, watch.

Additional clothing: Nylon pile cap, polypropylene long underwear tops and bottoms, heavier polypropylene turtle-neck shirt, parka and rainpants, polypropylene gloves, pliana fingerless gloves, mosquito head net, extra nylon running shoes, extra pair of sox.

Sleeping: Light down sleeping bag (good to 35 degrees) in waterproof stuff sack, foam pad, one-person tent.

Eating: Cup with cover, spoon, can opener, food sack, bear-bagging rope, plastic bags (for re-packaging food).

Water: Two water bottles (pint and three pints), Walbro water filter, 2/3 ounce bottle of Clorox.

Pack: Internal frame backpack, backpack rain cover, belt pouch, shoulder pouch.

Other: Maps (Xerox-reductions of guidebook maps and descriptions, with cumulative mileage written in, and the official state map) in waterproof map-case, compass, travelers checks, toilet paper and trowel, small knife, scissors, adhesive, pills (aspirin and diarrhea), ripstop repair tape, needle and thread, extra stuff sack, extra handiwipes, rubber bands, safety pins, flashlight, vaseline, sunglasses in case, toothbrush, bandanna, insect repellent, two pens, snake bite kit, note paper, comb, bible, chapstick, extra shoelaces.

A. EASTERN SEGMENT

The Eastern Segment consists of four distinct geological features.

First, from Sturgeon Bay to Algoma (23.5 miles of certified Trail) you traverse a glacial spillway which served to drain off the excess water from an enlarged inland Lake Winnebago, then some 100 feet higher than Lake Michigan. This glacial spillway left a broad valley with well-developed flood plains.

Second, the route, not yet usable, then follows Lake Michigan almost 25 miles south from Algoma to Tisch Mills on the Manitowoc County line. Here is the Great Lakes coastal zone, where the Niagara Limestone formation (Niagara Cuesta) resisted the action of the glacier. The high cliffs and shoreline terraces give some idea of the size of Lake Michigan's giant predecessor, Old Lake Nippissing. The beach is pocked by rocky buttes.

The third phase of the Eastern Segment is in the area between the Manitowoc County line and the Northern Kettle Moraine State Forest at Greenbush. Here the terrain abounds with terminal, ground, and interlobate moraines, kettle lakes, and erratic rocks. Farmers use these erratics for their stone fences. Only the 11-mile stretch between Tisch Mills and Francis Creek is currently hikeable.

This section of the Trail, when built, will cross the terminus of the Valders glacier frequently. Two main river basins will be traversed, the Manitowoc and the Sheboygan, along with many marshes.

Near Valders, the bedrock, Niagara Dolomite, is covered with only a few inches of glacial till. In a few places, notably the Valders Limestone Quarry, the striae left by the Cary and Valders glaciers can be seen. As the glaciers crushed debris of gravelly till and erratics along, it scratched the bedrock. At the Valders Quarry, singly striated (by the Cary glacier) and doubly striated (by both the Cary and Valders glaciers) rock is visible, along with polished bedrock. Here the Cary glacier moved in a southerly direction, while the Valders glacier moved westward. The striae are almost at right angles to each other. At the Valders Quarry, and the abandoned quarry at Quarry, old limestone kilns can still be seen. Both quarries are on private land, so permission is needed to visit.

Near the proposed corridor is Collins Marsh, reclaimed through construction of a dam on Mud Creek, just before it enters the Manitowoc River. More than 3,500 acres are set aside in conservancy and have become part of the flyway of many species of waterfowl. Geese, ducks, sandhill cranes, bitterns, herons, egrets, and other water birds can be seen. Northern pike and bullheads, and muskrat, beaver, and deer are abundant. On the grounds is a visitors' building, containing exhibits of the waterfowl and plants indigenous to the area. There is also a 100-foot ranger's tower, open every third Sunday. Binoculars are available to view the birds.

The two Kettle Moraine State Forests and the lands between, in the heart of Wisconsin's most heavily populated area, present the Eastern Segment's fourth geological feature—prime examples of moraines, kames, eskers, kettles.

Nearly sixty species of trees are to be found, together with manifold shrubs, wildflowers, ferns, and other plant life. The northern red oak is most in evidence, with basswood, sugar maple, shagbark hickory, white oak, and red maple close behind. The tamarack is the most prevalent conifer, followed by red pine, white pine, and white spruce. In shrubs, look for willows, dogwood, sumac, alders, elderberries, and poison ivy. Wildflowers include hepatica, trillium, bloodroot, mayapple, spring beauty, Jack-in-the-pulpit, columbine, and wood geraniums. Maidenhair, ladyfern, and woodfern abound. Animals are numerous—including nearly forty mammal species, ranging from whitetail deer and bear to mink and weasels. Care should be taken during state hunting seasons.

1. Door-Kewaunee Counties—the Glacial Spillway

At the start of the Trail is Potawatomi State Park, 1,126 acres, along the Green Bay shoreline, with picnic, water sports, camping, and cross-country skiing facilities. Here limestone bluffs are prominent, and bold headlands alternate with sandy beach coves. From the Observation Tower at the starting point you can see both Green Bay and Sturgeon Bay.

Sturgeon Bay is a shipbuilding community. The nearby Door County Historical Museum provides a free look at pioneer and Indian relics.

The Ahnapee State Trail winds through some of the most picturesque areas of Door County, including the quiet villages of Maplewood and Forestville. Hardwood maples in the area assure colors in the fall. A substantial portion of the Trail runs along the Ahnapee River, one of the few rivers in Door County, and passes through a classic peat swamp. The Forestville Millpond along the route is owned by the Door County Park System and provides a convenient wayside stop.

For more up-to-date information about the Trail in Door County, contact Potawatomi State Park, Sturgeon Bay, Wisconsin 54235; phone (414) 743-5123.

The Ahnapee Wildlife Area is adjacent to the final portion of the Ahnapee State Trail in Kewaunee County.

The von Stiel Winery, a Montmorency cherry winery, is located in Algoma. Fishing here, in the Coho fishing capital of Wisconsin, is excellent, with boat rentals available in the area.

Door-Kewaunee Counties (23.5 miles) (Map 1, p. 96)

→At Potawatomi State Park Observation Tower on Norway Road, follow the Sturgeon Bay branch of the Island View Trail south two miles to Shore Road.
→Southeast on Shore Road .8 mile to the Hemlock Trail.
→South on Hemlock Trail .5 mile to Shore Road.
→South on Shore Road 1.7 miles to Duluth Avenue in Sturgeon Bay.
→South on Duluth Avenue .8 mile to Juniper Street.
→East on Juniper Street .6 mile to Lansing Avenue.
→South on Lansing Avenue .3 mile to Maple Street.
→East on Maple Street .4 mile to Neenah Avenue.
→South on Neenah Avenue .3 mile to Oxford Avenue.
→Southeast on Oxford Avenue .5 mile to West Shiloh Road.
→South on West Shiloh Road 1.6 miles to the start of the Ahnapee State Trail.
→Follow the Ahnapee State Trail southwest 10.2 miles through Maplewood and Forestville to County Highway X at the Door-Kewaunee County line.
→South 3.8 miles to campground on Kewaunee County M.

2. Manitowoc-Sheboygan Counties—Old Lake Nippissing, Buried Forest, and Point Beach

The 11-mile Tisch Mills-Francis Creek segment is the only currently hikeable stretch. The 25-mile Trail corridor between the Ahnapee Trail and Tisch Mills will pass through Norman, just west of Kewaunee County B. Plans for the corridor include a rugged section along the Kewaunee River, a side trail to Buried Forest, and a connector with Point Beach State Forest.

Point Beach State Forest offers forest hiking. an unparalleled sand beach, and the Great Lakes' largest lighthouse. Twenty schooners, one barge, two steamers, and three brigs have gone aground on this point. Today, Point Beach's light towers over 2,700 acres, with 152 campsites, numerous picnic tables, a shelter lodge, a

full nature program in season, and a nuclear power plant nearby.

This area, along with the Two Creeks Buried Forest Reserve Unit, provides beach hiking through Dune grasses and dwarf and creeping junipers. Water-filled swales contain aquatic plants, including the uncommon swamp cinquefoil with its striking purple blossoms. The successional stage woods include pine, sugar maple, hemlock, beech, and yellow birch. Paper birches mark the beach-forest boundary. Several forested ridges mark the plainly visible shoreline of old Lake Nippissing.

The Point Beach State Forest naturalist program offers guided hikes, a self-guided nature trail, and sundry evening programs. The Point Beach Ridges within the forest boundary are designated a National Natural Landmark. Wilderness Ridge and Point Beach Ridges are Natural Areas.

Near Two Creeks, one can observe the severe erosion of the shoreline which occurred around 1900. A remnant of the old Two Creeks ship dock is still standing, showing pilings some 120 yards from the shore. These indicate the extent of the erosion in the last 80 years.

At the Point Beach Nuclear Power Plant a visitors' center offers films and other information about the area's topography and history. A nature trail is also open to the public with permission from the plant manager.

For more up-to-date information about the Trail in Manitowoc County, contact Point Beach State Forest, Two Rivers, Wisconsin 54241, phone (414) 794-7480; Woodland Dunes Nature Center, P.O. Box 2108, Manitowoc, Wisconsin 54221-2108.

The rich farmland of Sheboygan County was settled in the mid-1800s by Dutch and German immigrants. The picturesque rolling countryside is dotted with neat, prosperous farms where dairy and beef cattle and sheep graze in the fertile fields, cleared of the hardwood forests the early settlers found.

Sheboygan Marsh, once a glacial lake, lies in a pre-glacial valley. Glacial Lake Sheboygan was filled with till from the glacier and a marsh resulted. The marsh now comprises about 14,000 acres, 7,000 under county ownership, 400 under state ownership, and the rest privately owned. Around 1870, when the area was being settled, attempts were made to drain the marsh for farmland. This first attempt failed. From 1912 on, other attempts were made, until 1921, when conservationists sought restoration of the area as a marsh. In 1937, the area was purchased by the county and a dam installed. In 1967, the marsh was drained, the silted area in front of the dam was dredged, potholes were blasted for waterfowl nesting areas, and vegetation for food was planted on the mud flats. By 1968, the marsh once again had begun to return. Many varieties of wetland plant life can be found in the marsh, and the fishing is excellent. Facilities for boating, fishing, camping and picnicking are found near the marsh entrance.

Manitowoc County (11 miles) (Map 2, p. 97)
→From Tisch Mills at the Kewaunee-Manitowoc County line, hike south on the yellow-blazed trail 8.6 miles through Mishicot.
→Then west 2.4 miles to Francis Creek.
→From Francis Creek to Glenbeulah is a 45-mile gap in the Trail, although small segments here and there are presently hikeable. The proposed corridor goes Francis Creek-Whitelaw-Valders-St. Nazianz-Rockville-Sheboygan Marsh-Glenbeulah.

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3. The Kettle Moraine

The Northern and Southern Kettle Moraine State Forest and the lands between follow the interlobate moraines of the Michigan and Green Bay lobes (Map 3, p. 98). They offer good hiking, biking, and cross-country skiing through some of the world's outstanding examples of kames, eskers, kettles, knobs, and swales.

The Trail crosses largely hardwood forests of oaks, maples, and basswood, with some red and white pine stands and open fields.

Nuts and berries abound, including hazelnuts, wild plums, cherries, and strawberries. Woodland wildflowers, including great white trillium, toothwort, spring beauty, and white trout lily bloom in spring. The marsh areas support wildfowl, deer, raccoon, coyote, and fox. Wild turkey have returned to the uplands.

The Trail crosses the Greenbush Loop Trails (blazed in orange, red, and pink—10.8 miles), the Parnell Tower Loop Trail (a 4.25-mile hike blazed in yellow offering a spectacular view of Dundee Mountain, a huge kame), and the bridle and snowmobile trails (blazed in orange).

The Northern Kettle Moraine State Forest comprises 27,500 acres. Butler Lake, bounded by eskers on the east and west, provides fishing, boating, parking, and picnicking at a picturesque spring-fed kettle lake. The Kellings Lake area offers kettles in a marsh setting supporting a thriving red oak and maple forest on its perimeter. Remnants of the American Chestnut dot the south shore of Crooked Lake, victims of gas line construction rather than blight.

Moulin kames, resembling giant inverted salad bowls, are prominent near Trail Shelter 4. Parnell Esker, a classic glacial landform over a mile long, begins south of Trail Shelter 4.

Camping is available at Trail Shelters 1 through 5, with reservations mandatory. Camping is also available at Greenbush Group Camp and Long Lake Camp. The latter has 182 sites, laundry facilities, showers, and firewood. For current information, contact Kettle Moraine State Forest-North Unit, P.O. Box 426, County G, Campbellsport, Wisconsin 53010, (414) 626-2116.

Excellent skiing—beginners on the New Fane Trail, intermediate on Greenbush, and more advanced on Ray Zillmer—is provided on a 30-mile complex.

The Mauthe Lake Recreation Area on County GGG, named after William Mauthe, who was conservation commissioner when the Forest was created, offers swimming and fishing, in addition to hiking on the Tamarack Nature Trail. The Forest Headquarters is at the end of Mauthe Lake, off County Highway G. The campsites (168 of them) have electricity, water, firewood, and concessions. Near Dundee, off Highway 67, is the Ice Age Interpretive Center.

In general, the Trail in the Northern Kettle Moraine State Forest follows the East Branch, Milwaukee River watershed, along the edge of the Lake Michigan interlobate moraine. It is blazed in blue, in contrast to the yellow blazes elsewhere on the Trail.

Little Mud Lake provides habitat for waterfowl and small mammals, including mink, beaver, badger, and woodchuck. Forests in the area are largely oak, with some maple, basswood, and ironwood. The marsh surrounding Little Mud Lake offers a cranberry bog and a small prairie on the northeast bank.

The Trail briefly traverses Fond du Lac County, where one finds the Spruce Lake Bog, Haskell Noyes Memorial Woods, Milwaukee River and Swamp, and the Spring Lake Natural Areas.

Northern Kettle Moraine State Forest, Proper (32.4 miles) (Map 4, p. 99)

→Start at Glenbeulah on County P, southwest across Highway 23 to Greenbush Base Camp.
→Follow blue blazes overland south 1.2 miles to Trail Shelter 5.
→Southward from the Shelter one mile to State Highway 67.
→South across Highway 67 1.8 miles, joining the yellow-blazed Parnell Tower Loop Trail for .8 mile, to County Highway U.
→Southwest from County U 1.5 miles to Scenic Drive.
→Southwest across Scenic Drive 1.6 miles along the Parnell Esker to County Highway V.
→West, then southwest 1.8 miles, crossing the Butler Lake Loop Trail twice, to County Highway F.
→South across County F .7 mile to Trail Shelter 3.
→East from Trail Shelter 3
→South 3.1 miles to County Highway SS and the Little Mud Lake wayside.
→East .3 mile from the wayside again following blue blazes.
→South and west 1.3 miles around Forest Lake to County Highway GGG.
→West across County GGG .3 mile.
→South .4 mile to the Mauthe Lake access road.
→South 1.7 miles across the road to Trail Shelter 2.
→South from the shelter 8.9 miles past the Sheboygan-Washington County line to the end of the Kettle Moraine State Forest at Washington County H.

Washington and Waukesha Counties cover the area between the Northern and Southern Kettle Moraine State Forests. Had the 1942 recommendations of the Izaak Walton League been followed, the two State Forests would have been connected by a strip of moraines patterned after the Appalachian Trail. Now, almost 50 years later, the Ice Age Park and Trail Foundation is on the verge of completing the link which should have been acquired early on.

The first seven miles of the Trail south of where the Northern Kettle Moraine State Forest ends at Washington County H—Sunburst Hill—is being worked on, but is not yet open. Heading west, it will cross the Milwaukee River, C&NW railroad tracks, and Highway 45, and then climb the steep Sunburst ski hill. It will then head south on top of the high moraine to the trailhead of the Ridge Run section, on County D.

Trail Directly South of Northern Kettle Moraine State Forest (9.1 miles) (Map 4, p. 99)
This Ridge Run section is hikeable now.
→Start with a 2-mile stretch on top of the steep moraine between County D south to Highway 33 (in the midst of a shopping center), officially certified in September, 1986.
→Proceed .8 mile to Ridge Run County Park, at the western edge of West Bend. The Park offers limited camping and picnicking facilities. Nearby are Boot, Wells, and Pick lakes; and Lizard Mound Park with its 31 Indian burial mounds.
→Hike south over Girl Scout camp land 2.3 miles around Lucas Lake to Paradise Drive.

Then comes a big gap of 9 miles, from Lucas Lake to Slinger. In this Cedar Lake-Fox Hill area, the Trail corridor goes west on Paradise Drive to Washington County Z at the north end of Little Cedar Lake, south on Z to NN, west on NN to Highway 144, south on 144 to the overpass over Highway 41 at the edge of Slinger. Negotiations are under way to establish an off-road trail for this section.

It is a beautiful glacial area, featuring a fine kame, Fox Hill. It has many lakes—Lucas Lake, with a maple and beech forest at its south end; Silver, with the 1843 home of Surveyor Densmore Maxon and its nearby dam and sawmill on Silver Creek still discernible; Little Cedar, with a wayside providing water, picnicking, and toilets; and Big Cedar, a sailing and fishing lake at the headwaters of Cedar Creek.

Slinger-Pike Lake to Holy Hill, Washington County (10.3 miles) (Map 5, p. 100)
→For the Slinger portion, 2 miles certified in May, 1989, take the sidewalks, from the Highway 144 overpass over Highway 41, south down Kettle Moraine Drive past the Little Switzerland ski area, a picturesque kame.
→West on Hartford Road and south on Howard Avenue through a second-growth forest full of sumac, box elder, poplar, blackberries, and wild grape, to Highway 60, where the Trail is being hooked up with the Pike Lake State Park segment.
Slinger was originally Schleisingerville, but changed its name in the World War I anti-German hysteria. It boasts many fine old brick buildings, including two churches dating from the 1860s.
→Proceed for 2 miles through Pike Lake State Park, certified in 1984.
The Park abounds in kettles and kames, and offers camping, picnicking, swimming, fishing, and nature trails. A cattail and sedge marsh borders the lake, with Joe-pyeweed, swamp milkweed, and spiderwort.
→Continue south on the Holy Hill segment to Donegal Road and Holy Hill for 6.3 miles.

The Holy Hill segment is being lovingly maintained by the Wisconsin Go Hiking Club, an organization founded in 1924 to promote good health and good fellowship. It offers many kames and kettles, a state record sugar maple with a circumference of 11.5 feet, charming little wildflower plots around each directional sign, and some magnificent views. The Trail traverses a number of glacial boulder fences and farm woodlots.

Holy Hill, elevation 1,335 feet, towers 300 feet over the surrounding countryside. The Decalced Carmelite fathers who have presided over the monastery since 1906 have been wonderful friends to the Ice Age Trail. The Shrine of Mary at the top has been the subject of Roman Catholic pilgrimage for more than a century.

From Donegal Road south to the Waukesha County line at Monches, some 3.5 miles, is a potentially first-rate section of the Trail, largely through the DNR Lowe's Lake area. It should be open for hiking in 1991. (Glacial Hills County Park is on Friess Lake Drive, three miles east of the junction of County K and Highway 167.) The Trail will combine the DNR lands recently acquired at Lowe's Lake with several private parcels purchased by the Ice Age Park and Trail Foundation. This section will traverse the Town of Erin, settled by the Irish in the 1850s. Its streets and roads have names like Galway, Emerald, and Donegal. As late as 1974 the Town's fiscal year ended on St. Patrick's Day, March 17.

The Trail in Waukesha County, north of the Southern Kettle Moraine State Forest, follows three charming little rivers which rise on the inner edge of the Green Bay Lobe—the Oconomowoc, whose source is at Friess Lake in the Holy Hill region; the Bark, which rises in the wetlands north of Merton; and the Scuppernong, which starts in the valley to the east of Lapham Peak. They ultimately join the Rock, and thence the Mississippi. They are thus on the Mississippi side of the sub-continental divide, as opposed to earlier streams met with by the Trail hiker, such as the Milwaukee River, which have their origin on the eastern edge of the Lake Michigan Lobe, and thus flow into Lake Michigan.

Because the Trail here is stream-oriented, and because streams attract settlement, the Waukesha County Trail passes through or near a number of communities. Far from being a detriment to the Trail, these small centers add interest. From north to south, they are:

Monches, settled by the Irish fleeing from the Potato Famine of the 1840s. Originally named O'Connellsville, it became Monches when a local dissident persuaded the Post Office to make the change. Monches was the name of a Menomonee Indian chief; or possibly it is a corruption of "Mon Chaise"—"My Easy Chair." Whatever its origin, Monches offers an old mill and millpond on the Oconomowoc River, a cemetery with headstones dating back to the 1850s, a country store, a tavern, and a fine restaurant.

North Lake, with a smithy, several old taverns and restaurants, a rustic Town Hall Library, handsome Catholic and Episcopal churches, and an honest-to-goodness steam railroad train which runs scenic excursions to Merton on the weekends. The Trail crosses the Oconomowoc River at Funk's Dam just upstream from the village.

Merton, with a millpond and dam on the Bark, a large feed store, and several historic buildings, is the western terminus of the Bug Line Waukesha County hiking and biking trail which starts 10 miles east at Menomonee Falls. In the not too distant future, the Bug Line trail may be extended a mile to the west to make contact with the Ice Age Trail at Dorn Road, thus giving residents of northern Milwaukee County and of eastern Waukesha County direct access to the 1,000 miles of the Ice Age Trail system. (For a similar access 12 miles to the south, see the Greenfield Park-New Berlin Trail-Glacial Drumlin State Trail link-up discussed above under Bike Trails.)

Hartland, whose 2.3-mile segment of the Ice Age National Scenic Trail was certified in September, 1988. Hartland boasts several excellent eating-places, a huge quarry for the glacial gravel under the moraine, and a walk along the babbling Bark River to Nixon Park, named after Hartland's beloved doctor-of-the-old-school.

Delafield, further down the Bark, offering Hawks Inn, an 1846 staging inn, Cushing Memorial Park (picnicking and toilets), a state fish hatchery on the Bark, and St. John's Military Academy, alma mater of Chicago Congressman and Ways and Means Committee Chair Dan Rostenkowski and of Elder Statesman George M. Kennan.

Waterville is a tiny hamlet at the site of the widening of the Scuppernong known as Waterville Lake. It contains several historic buildings.

Because it follows water, this section of the Trail is mostly low, looking up at the surrounding hills. But it also has its uppers—the "Lost Mile" moraine at its northern end; the soon-to-be-completed Nagawaukee stretch south of Hartland, with its spectacular views of Lakes Pewaukee and Nagawicka; and above all, Lapham Peak, at 1,233 feet the highest in Waukesha County.

A 671-acre unit of the Southern Kettle Moraine State Forest, Lapham Peak State Park is crowned by a 45-foot observation tower with views of Holy Hill and Pewaukee and Nagawicka Lakes. The unit is named in honor of Increase A. Lapham, pioneer Wisconsin scientist. Information is available at the Lapham Peak Office, W329 N846 Highway C, Delafield, Wisconsin 53018, (414) 646-3025.

"With each season of the year different sights greet the visitor to Lapham Peak," says the unit's brochure. "Spring brings wildflowers and the return of migrating birds. Summer is the time for picnicking in a shady spot and climbing the observation tower. Fall brings brilliant colors. Winter has beautiful scenery and cross-country skiing."

Lapham Peak is close to the picturesque Welsh village of Wales, and to the Genesee Depot home of the late Alfred Lunt and Lynn Fontanne.

Starting at Monches on the Washington-Waukesha County line, the Trail, certified in 1987, heads south for 3.5 miles over the "Lost Mile" moraine through hardwood forest, crossing the Oconomowoc River from west to east on a wooden bridge above Funk's Dam.

A projected segment, not yet open for hiking, will proceed from Funk's Dam south to the edge of the Kettle Moraine Steam Railroad right-of-way, then east 2.8 miles to Dorn Road; south on the west edge of Dorn Road .2 mile past Tamron Lane to the Bark River Bridge; south along the Bark River 6 miles through Hartland south to the junction of County E and KE. The 2-mile Hartland segment was certified in 1987. No Trail exists for the next two miles to Nagawaukee County Park (swimming, golf, picnicking); with a little luck in landowner negotiation, it should be ready in 1991.

Waukesha County (10.5 miles)
(Map 6, p. 101)

→From Nagawaukee County Park, a certified 1-mile segment, the next 9.5 miles is the subject of an application for certification.

→The Trail will first go west over the abandoned Wisconsin Electric Power Company right-of-way to historic Delafield, west on Stocks Drive, south on Genesee Street, west on Wells Street and Main Street.

→South on Cushing Park Road, under I-94, to the intersection with Forest Ridge Road.

→East and south through Lapham Peak Park and across Highway 18 to Glacial Drumlin State Trail.

→West on Glacial Drumlin to the University of Wisconsin-Waukesha Field Station.

→South to Ottawa Church at the junction of County C and D.

The Trail will in the future connect with Southern Kettle Moraine State Forest, two miles further south.

Created in 1936, the Southern Kettle Moraine State Forest has been sensitively managed by the DNR. Wildlife, including the wild turkey and the ruffed grouse, have been reintroduced; trout streams have been reinvigorated; pine plantations have been thinned; and prairies and oak openings have been managed by controlled burning.

Southern Kettle Moraine State Forest (28.4 miles) (Map 7, p. 102)

The Forest contains four self-guided nature trails, 160 miles of hiking trails, 60 miles of cross country ski trails, many campgrounds and picnic sites, and a natural history museum at the Visitor Center, three miles west of Eagle on Highway 59, (414) 594-2135.

Note Spy Glass Hill, with a memorable view to the west; Ottawa Lake Fen Natural Area, a glacial lake bed with lowland prairie vegetation; Scuppernong Prairie, Kettle Moraine Low Fen Prairie, and Eagle Oak Opening, Natural Areas near Eagle; Paradise and Scuppernong Springs; Elephant Rock, a huge granite boulder near Palmyra; Old World Wisconsin, the ethnic village maintained by the State Historical Society; and the Lulu Lake and Irvin L. Young Prairie Natural Areas near Whitewater Lake.

Formerly mostly prairie, the unit is now covered with oak, shagbark hickory, and pine plantations. Prairie wildflowers of late spring and summer include shooting star, pasque flower, violet, phlox, wild indigo, prairie smoke, gayfeather, coneflower, rattlesnake master, compass plant, and prairie dock.

B. CENTRAL SEGMENT

1. Walworth-Rock-Green Counties— The End Moraine

The Central Segment follows the End Moraine of the Green Bay Lobe, leaving it only briefly for the unglaciated region around New Glarus in Green County. The 3.7 mile Janesville segment; the 26-mile Sugar River State Trail from Brodhead to New Glarus; and the 3 mile

Brooklyn Wildlife Area segment are presently all hikeable.

The Central Segment's two big gaps are still in the planning stage. The first gap, 14 miles from Whitewater Lake at the southern end of the Southern Kettle Moraine State Forest to Janesville, is projected to parallel the pleasant little Cold Spring Creek through the outwash plain to Lima Center, and then go through the Lima Center and Storrs' Lake wildlife areas to Milton and Milton Junction, then on to Janesville over the abandoned railroad right of way.

Rock County (3.7 miles) (Map 8, p. 103)
Completed and hikeable are 3.7 miles in the city of Janesville.

The second gap, 15 miles, runs from Janesville to Brodhead.

Along the actual or prospective route, in Rock and Green Counties, are some interesting communities.

At Whitewater, just north of the Trail corridor, is the state university, with dormitories named Drumlin and Kame after the formations which dot its campus.

At Milton, Milton House Museum was an early stagecoach inn (1844), and a station on the underground railway for runaway slaves from the south. A newly restored general store is nearby, along with the Goodrich Log Cabin. The first poured concrete building is also in Milton. Milton Park is located on the east end of town, with facilities for recreation and picnics, water, and toilets. LaMar Park is smaller, with similar facilities.

In Janesville, tours are available weekdays at the General Motors assembly plant and the Parker Brothers Pen Company. Abraham Lincoln first visited Wisconsin as a private in the Indian Wars. Almost 30 years later he returned while campaigning for the presidency and stayed at the Tallman Homestead in Janesville, now restored and furnished with antiques, as it was when it was a stop on the underground railway. Arrow Park contains a curious collection of native flags and stones from nearly 100 countries. The city offers ample supplies for the biker and hiker.

Near Albany in Green County there are three Natural Areas: Abraham's Woods, Oliver Prairie, and Muralt Bluff Prairie.

New Glarus was founded in 1845 by 108 settlers from Glarus Canton, Switzerland. Their descendants still speak Swiss-German, make cheese, and celebrate the old holidays in traditional clothing and dances. Every August, the townspeople stage the drama "Heidi." And on Labor Day weekend, the Wilhelm Tell Festival attracts visitors from the entire Midwest. The Swiss Village Museum features a blacksmith shop, reconstructed church, and a cheese factory. The Chalet of the Golden Fleece, modeled after a Swiss mountain house, offers a number of doll, kitchenware, and glass collections. New Glarus Woods State Park, just south of town, has picnic and camping facilities.

Green County (29 miles) (Map 9, p. 104)
The 26-mile Sugar River State Trail offers level biking and hiking. Contact the Trail Headquarters in the railroad depot, P.O. Box 781, New Glarus, Wisconsin 53574.
The 3-mile Brooklyn Wildlife Area segment follows the moraines to the west of Story Creek.
The Exeter segment linking Sugar River Trail and Brooklyn Wildlife Area is being completed.

2. Dane County-Cross Plains Glacial Area

The Dane County Trail corridor, leading north through western Dane County, offers an excellent example of terrain contrasts. It begins in the driftless area just north of New Glarus, crosses the Johnstown End Moraine, and emerges on the glaciated edge of the Wisconsin River in Columbia County. Back-country roads pass through small, friendly villages and towns, leading to the Cross Plains Ice Age Reserve Unit south of Cross Plains. Festge County Park just west of Cross Plains offers excellent views of the driftless area south and west. Just to the south is New Observatory Woods, a Natural Area.

At Indian Lake is 442-acre Indian Lake County Park. An officially certified 1.2 miles of the Trail in Indian Lake County Park is so far the only certified mileage in Dane County. An additional 2.2 miles is hikeable, as is 2.5 miles in Badger Prairie County Park. Indian Lake

County Park offers an enchanting glacial lake; a pioneer chapel, St. Mary of the Oaks built in 1857 by John Endres and his son, Peter; and a granite memorial to Jerry Baer, 1947-1976, beloved physicist and Ice Age trail-blazer, who died in a tragic water accident.

In Dane County Highway B, three miles north of Stoughton, is the site, marked in a tablet set in a boulder, of Robert M. La Follette's childhood home at Primrose. On State Highway 23, south of Spring Green, is Taliesin, the studio and school established by Frank Lloyd Wright.

Blue Mounds is the locale of Blue Mounds State Park, which is centered on Blue Mound itself, the highest point in southern Wisconsin, at 1,716 feet. Cave of the Mounds is a few miles east of Blue Mounds, and offers a fascinating underground world of fossils and formations.

At Mt. Horeb, on Dane County Highway JG, just off U.S. Highway 18 and 151, is Little Norway in "The Valley of the Elves." A restored farm, with homestead, barns and other outbuildings filled with antiquities is displayed there, originally constructed by one of the first Norwegian families to settle here in the 1850s. Included in the display is a replica of a Norwegian stave church, with gingerbread decorations. It houses a collection of old Norwegian wood, silver, and leather crafts.

Dane County Ice Age volunteers are working hard to complete their county's segment.

3. Sauk-Columbia-Marquette Counties—Devil's Lake and the "Sacred Way"

Most of the Trail in this section is still in the planning stage. But the hikeable portion includes two of the most memorable stretches of the 1,000 miles—the geologically sensational Devil's Lake and the evocative Sacred Way (to borrow from ancient Rome) between Aldo Leopold's Sand County Shack and John Muir's boyhood home. Here and to the north, the Trail skirts the driftless area and follows the broken line of the Green Bay lobe end moraine.

The Trail, planned but not yet usable, picks up from Dane County at the Columbia County line in the DNR wildlife area south of Lodi. It will go 10.8 miles through Lodi, following Spring Creek, which yields trout to the fisherman right under the Main Street bridge; past Suzie the Duck, a local favorite; and through Haberman Park. The Trail will then go overland past Gibraltar Rock, 1,240 feet high, and cross over the Wisconsin River on the free ferry to Merrimac.

Merrimac's first settler, Chester Mattson, set up a ferry to cross the Wisconsin River in 1844. Under state auspices and free, the ferry continues today, providing the first of several crossings of the river the Trail makes.

As the Trail passes the Wisconsin River, you can see why August Derleth of Sauk City entitled his book: *The Wisconsin: River of a Thousand Isles* (Holt, Reinhardt, and Winston, 1942):

> Great and small, islands dot the Wisconsin from its headwaters to its mouth, some of them shifting sandbar islands, staying long enough to grow a few trees and shrubs before disappearing again, but most of them substantial bodies of land, heavily wooded, sometimes so long that it is impossible to see from end to end, or even to ascertain that their nearer shore is not, indeed, the shore of the Wisconsin itself. Some of them retain the appearance they must have presented to the earliest explorers: hung with grapevines, bittersweet, carrion berry, greenbrier; abounding with trees, many of them tremendous in girth, here and there still a right-angled tree, hoary with age now, once bent by a passing Indian to make a trail-marking tree.

From Merrimac the Trail, still just in the planning stage, will climb the Baraboo Range north 9 miles to Devil's Lake State Scientific Reserve, described in Chapter 5. Nearby are the Koshawago Springs, Pine Glen, Red Oak Forest, and Parfrey's Glen Natural Areas.

A 4 mile long, presently hikeable Parfrey's Glen segment goes from the parking lot on County DL at Parfrey's Glen Natural Area to State Highway 113. On the crest of the Baraboo Range, the segment climbs 750 feet—the largest vertical gain on the entire Trail.

Sauk County (6 miles) (Map 10, p. 105)
The Trail, first-rate, well-marked, and officially certified, goes west around Devil's Lake and then back east again for 6 miles.

From Devil's Lake State Park north over the Baraboo River, the northern Baraboo Range, and on to the Wisconsin River levee, the Trail,

again, is still in the planning stage. Its general direction, for some 16 miles, might be to cross the Baraboo River over the abandoned bridge in the Town of Greenfield; touch Man Mound Park, a rare effigy mound of a human; and then cross I-94 to where the Levee Trail segment starts on the Wisconsin River levee at Hein Road.

Marquette-Columbia Counties (25 miles) (Map 11, p. 106)

Here the Trail becomes official for the next 25 miles, traversing the way from Aldo Leopold's beloved Sand County bottomlands to John Muir's boyhood home at Fountain Lake.

→From Hein Road and Levee Road, follow the levee for 11 miles east, and cross the Highway 33 bridge over the Wisconsin River to Portage. East on West Edgewater Street past Zona Gale's home and other historic houses .5 mile to Portage Canal.

→Along the canal 1.9 miles to the Fox River at the Indian Agency House (near Old Fort Winnebago Surgeon's Quarters, the marker for Marquette-Joliet's 1673 portage, and the marker for Chief Red Bird's surrender in 1827).

→North along the left bank of the Fox River for 4.1 miles to Governor Bend County Park (named after Governor Dodge).

→East on Lock Road .3 mile.

→North on old Fox River Road 1.8 miles to the Marquette County line.

→Northeast overland past Grouse Road 1.3 miles to 12th Avenue.

→North on 12th Avenue right-of-way 1.6 miles to County O.

→North overland 2.5 miles to John Muir County Park.

An alternative Trail corridor—from Devil's Lake State Park to the Marquette-Waushara County line—to that just described is planned. This alternative would branch northwest from Devil's Lake, through Mirror Lake and Rocky Arbor State Parks, thence up the west side of the Wisconsin River, coming over to Adams County, and thence to a junction of the two segments just east of Highway 51 at the Marquette-Waushara County line. Though it detours from the moraines, the alternative gives a glimpse of the unglaciated area and of the bed of ancient glacial Lake Wisconsin.

Near Portage is the old Fox River-Wisconsin River Canal, on the site of the old Indian Portage; Fort Winnebago Surgeon's Quarters, built more than 125 years ago, containing a typical army surgeon's medical needs; and Old Indian Agency House, 1832. Pacquete Park in Portage has picnic shelters, grills, toilets, and water. Veteran's Memorial Field has overnight camping, toilets, and water. The city has a bike shop, groceries, restaurants, doctors, rooming houses, and private campground facilities.

Portage is important in Wisconsin history. Half a mile east of the city, on State Highway 33, is the portage negotiated by Marquette on June 14, 1673, joining the north and east flowing waters of the Fox River to the west and south flowing waters of the Wisconsin River. The link was vital to the early years of the state and of the region.

Near Marquette's portage are the remains of Fort Winnebago, built in 1828 to protect the Fox-Wisconsin portage and the traders who used it. Jefferson Davis served here. Surviving a disastrous fire in 1856 are the restored Surgeon's Quarters and the Indian Agency House.

Portage was the birthplace of Frederick Jackson Turner, the historian, and also the birthplace and lifelong home of the novelist, Zona Gale. Born a farmgirl in Johnstown Center, Rock County, the poet Ella Wheeler Wilcox often visited Portage. Georgia O'Keefe, the painter, spend her first 15 years in nearby Sun Prairie in Dane County.

Five miles northeast of Portage on Columbia County Highway CM was another immigrant settlement. Unemployed potters from Staffordshire, England, brought over in 1849 by Thomas Twiggs, set up the Emancipation Ferry crossing the Wisconsin River, and named for the hope of a better life for all in the New World.

From John Muir County Park to the Waushara County line is a 21.2 connecting road segment. Along little-traveled roads, the hiker goes northwest on 10th Road 4.5 miles to Marquette County D; west on County D two miles to 8th Drive; north on 8th Drive 1.2 miles to Emerald Lake at Highway 23; east on shoulder of Highway 23 .5 mile to County ZZ; north on 9th Avenue (ZZ) three miles to Ember Drive; west on Ember Drive .3 mile to 8th Drive; north on 8th

Drive 1.1 miles to Elk Lane; east on Elk Lane .5 mile to 9th Drive; north on 9th Drive .8 mile to County J; east on County J .2 mile to 10th Ave.; north .9 mile to County B/E; east .4 mile to 8th Road; northeast on 8th Road 2 miles to 7th Lane; north on 7th Lane .1 mile to Dover Court; northeast on Dover Court .5 mile to 8th Drive; north 1.2 miles to County Z; west on County Z .4 mile to County JJ; north on County JJ 1.3 miles to Waushara County Line at Chafee Creek Fishing Area.

Marquette County's section of the Trail contains moraines, kames, and extensive wetlands that often make the little-used roads the best means of passage for the hiker. The Trail crosses some excellent trout streams, including Caves, Lawrence, Tagatz, Chafee, and Wedde Creeks. Sandhill cranes are frequently seen.

Montello, the Marquette County seat, was once known as Mont L'Eau, "hill by the water," to the early fur traders and explorers. Since 1879, the quarry in the center of town on Main Street has been worked bringing out the hardest red granite in the world, Montello granite is used for paving, construction, and monuments (including Grant's Tomb in New York City and General Custer's monument in the Black Hills).

Packwaukee, on the north side of Buffalo Lake, was first settled by John Noyes in 1836. He made the first land entry in the county. Also near Packwaukee, named after a friendly Winnebago Indian chief, are scores of burial mounds. Endeavor Marsh is a nearby Natural Area.

Close to two-thirds of Marquette County remains primitive, with oak and pine forests and extensive grass marshes.

4. Waushara-Waupaca-Portage Counties—Glacial Boulders

The Trail in these three sand counties consists of the excellent 11.7-mile Hartman Creek segment, and of plans for many more miles of continuous trail along the recessional moraines which lie just to the east of the terminal moraine.

The land is full of boulders—glacial erratics of granite, quartzite, sandstone, basalt, and limestone scooped up further north and dumped here by the ice sheets. The early settlers cleared their fields of these boulders, some weighing up to a ton, and dumped them in narrow fence-rows.

The sandy soil is hospitable to oak, and to plantations of white pine.

The future alignment of the Trail in Waushara County will join the Marquette County Connecting Road Segment at JJ on the County line, then north through Richford, then following the Mecan River to Greenwood Wildlife Refuge, then northeast to the junction of Highway 73 and County O, then north to the Portage County line at Heffron.

Waupaca-Portage County (11.7 miles) (Map 12, p. 107)

Here starts the eminently hikable Hartman Creek Trail segment from 2nd Avenue north to Highway 10.

From Highway 10 north to the Marathon County line, through Waupaca and Portage Counties, the future alignment is currently being projected.

Portage County is one of the oldest Polish settlements in America. Michael von Koziczkowski, one of the first Polish settlers in 1857, was instrumental in bringing over more immigrants from Prussian Poland. Sacred Heart Church in Polonia, with the Felician Sisters school and orphanage, is a local landmark built by the Poles.

For information about the Trail, contact the DNR Ranger Station, 301 Cedar Street, Stevens Point, Wisconsin 54481, phone (715) 344-2752; Hartman Creek State Park, Waupaca, Wisconsin 54981, (715) 258-2372.

C. NORTHWESTERN SEGMENT

The Trail here is strong, due largely to the work of some sons of Paul Bunyan—Joe Jopek of Langlade County, Dave Phillips of Lincoln County, Bob Rusch of Medford, and Adam Cahow of Chippewa Falls.

1. Marathon County—Falls of the Eau Claire

Marathon County volunteers started building their trail early, and had it substantially completed by the mid-1970s. Unfortunately, the southern part of the Trail, from Shantytown to Ringle, has been inundated by eager beavers, and is no longer passable.

Marathon County (8 miles) (Map 13, p. 108)
An interesting stretch runs from Ringle on Highway 29 north to County N. This Plover River segment follows generally the terminal moraine, and the Plover and Eau Claire Rivers, through hardwood forest and pine plantations. Timbering along much of the route is currently being carried on by Wausau Paper Mills.

It is hoped shortly to complete the last 6 miles of the Trail to Eau Claire Dells County Park, with its spectacular falls. For further information, contact the DNR, Marathon County Courthouse, Wausau, Wisconsin 54401, (715) 842-0471; Marathon County Park Department, Courthouse, Wausau, Wisconsin 54401.

From Eau Claire Dells to the start of the Langlade County segment at Polar is a gap of 31.7 miles. Langlade and Marathon County Trail volunteers are working on it.

2. Langlade-Lincoln-Taylor-Price Counties—Lumberjack Country

The Langlade County section is well-forested, with over 121,000 acres of county forest and nearly 50,000 acres of private forest. The county's 858 square miles includes 285 lakes with excellent fishing and more than 350 miles of trout streams.

The county lies wholly within the Northern Highland, once a highly mountainous region. It was reduced by stream erosion to an area of low relief long before the Pleistocene era. During the Ice Age, glaciers scoured the tops of whatever higher areas remained, and filled in the valleys with debris, creating a rather smooth surface. Parts of two ice lobes, the Green Bay Lobe from the east and northeast, and the Chippewa Lobe from the north and northwest, invaded the county, leaving a terminal moraine which extends in a southeasterly direction through Parrish. This smaller lobe is the Langlade-Wisconsin Valley Lobe.

The area north and east of the terminal moraine is gently rolling, with a few rough areas. The portion overlain with older glacial drift is deeply carved by the streams. Settlement in this area is sparse to non-existent, so supplies should be purchased before entering the area. Antigo, Polar, and Summit Lake offer groceries, water, and other supplies needed by both hikers and bikers.

For information on the Trail in Langlade County, contact Joe Jopek, Langlade County UW-Extension Office, Antigo, Wisconsin 54409, (715) 623-4156.

There are five sub-sections of overland trail in Langlade County: Kettlebowl, Lumbercamp, Old Railroad, Highland Lakes, and Parrish Hills. All are marked with pink paint blazes. Parking areas are indicated on the maps.

Langlade-Kettlebowl (14.5 miles) (Map 14, p. 109)
This segment offers excellent examples of odd glacial kettles. Mature hardwoods line most of the Trail all the way to the Kettlebowl Recreation Area. Deer, grouse, red squirrels, and porcupines may be observed. This segment runs through hilly countryside, dotted with huge granite boulders, more evidence of the massive ice sheet which once covered the area. Kent Lookout Tower, at 1,903 feet, is Langlade's highest point.

Langlade-Lumbercamp (9.2 miles) (Map 15, p. 110)
This segment gets its name from early logging in Langlade County. For approximately six miles, this segment follows an old railroad grade, where at one time trains carried men and supplies to lumber camps, and then carried away the forest harvest.

Three-fourths of the way along this portion lies the remains of an old logging camp, consisting of a large, grassy clearing and a cement root cellar. Originally the camp probably contained log cabins for housing the lumberjacks, a hayshed and stable for the draft animals, a kitchen, mess hall, and perhaps even a blacksmith and carpentry shop. The Trail passes through mature hardwood forests and exemplifies the hilly topography left by the Wisconsin Glacier.

Langlade-Old Railroad (9.3 miles)
(Map 16, p. 111)
This segment gets its name from the railroad grade most of this portion follows.

In the early 1900s trains followed this route, carrying supplies and men to the lumber camps. Original wooden ties and iron spikes—where they have not been covered by sand or gravel—can be seen along the Trail. Hikers pass through hardwood forests and lowland bogs where diverse animal and plant life can be observed. At one point the Trail runs along County Highway J. Veterans Memorial Park on Jack Lake is a half mile further south on County J, offering camping, picnicking, swimming, and fishing.

Langlade Lakes (incomplete)
(Map 17, p. 112)
This segment is one of the most scenic portions in Langlade County, leading west among many kettle lakes and swampy areas on old logging routes and directly overland to a fire lookout tower. Because landowners' permission has not yet been acquired over one stretch, this requires a walk over 4.5 miles of town road.

Langlade-Parrish Hills (12 miles)
(Map 18, p. 113)
This segment winds its way west through deep woodland, crossing two beaver dams. White cedar and tamarack abound in the lowlands, along with scattered elms and black ash. It ends in a parking area on the Lincoln County line.

Lincoln County (18 miles) (Map 18, p. 113)
This segment winds picturesquely through the Harrison Hills area, following logging roads or going cross-country to its current end on County J. It touches numerous small lakes, passes over small streams, skirts swamps and winds its way through stands of stately white birch. The first rest stop is at the Harrison Hills Recreation Area, three miles from the County line.

The Lincoln County Trail is not usable from County J to the Wisconsin River. But by 1991, a 15-mile Trail should be hikeable from the Wisconsin River at Grandfather Dam westward toward the Taylor County line.

For information about the Trail in Lincoln County, contact the DNR, North Central District HQ, Box 818, Rhinelander, Wisconsin 54501, (715) 362-7616.

Taylor County, thanks to the U.S. Forest Service and to its superb Trail volunteer chapter, boasts three of the brightest jewels in the Ice Age's crown, all officially certified—the 15-mile Wood Lake-Rib-East Lake segments, running from the Lincoln County line to Highway 13; the 40-mile Chequamegon National Forest segment; and the 10-mile Timm's Hill National Trail, officially certified by Secretary of the Interior Manual Lujan in April, 1990, the first side trail ever in the National Trail System.

Taylor County (65 miles)
(Maps 19-20, pp. 114-115)
The Wood Lake-Rib-East Lake segments are mostly through county forest, crossing numerous glacial ridges, streams, wilderness ponds, and the 150-acre Wilderness Bog. Forests are mixed hardwoods, pine, hemlock, and balsam fir.
→The segment ends at the wayside park on Highway 13, offering water, toilets, and picnicking.
→From the wayside the trail proceeds for 3.5 miles along Highway 13 and Chelsea Road before picking up the Chequamegon National Forest segment, passing Mondeaux Flowage, North Fork, Jerry Lake, Lake Eleven, and Beaver Creek.
→The *Mondeaux Flowage* section follows the yellow blazes through the Chippewa Lobe moraine. Peculiar to this area are "stagnant ice" glacial landforms. Look for the flat-topped hills that geologists call "perched lake plains." Also found here are small kettles and lakes and forest-covered kames and knobs. Numerous are "crevasse-fill" ridges, whose hogback characteristics make for curious vistas and for up-and-down hiking and cross country skiing. This section's forests are dense, with sugar maple,

basswood, yellow birch, red and white pine, hemlock, and aspen.

The Lakeview Picnic Area and Eastwood Campground on the 450-acre Mondeaux Flowage offer camping, toilets, water, and picnic sites. Note the pines on high, dry kames and knobs (silt and sand composition), while the perched lake plains (underlain by clay and silt) feature hardwoods. You may even find marsh on the flat tops of these glacial oddities.

Prior to the arrival of the first white people, the area was inhabited by woodland Indians, the Menominee, Winnebago, Chippewa, and Sioux, changing their residences with the fortunes of intertribal warfare. There is some evidence that the early French voyagers, Radisson and Groseilliers, may have visited here in the trapping seasons of 1656-1658, joining the tribes to hunt the interior streams leading from the main Chippewa River. Father Rene Menard, a Jesuit missionary, is reported to have died mysteriously near the headwaters of either the Jump River or Yellow River in 1661. In time, missionary work and trapping gave way to logging and farming. Reforestation started in the Depression of the 1930s, with the creation of the Chequamegon National Forest.

➔The *North Fork* (Yellow River) section follows yellow diamond-shaped plastic blazes through the regenerating aspen and hardwood forest and old logging roads of the Yellow River area. Located along the Chippewa moraine, it also passes near "stagnant ice" glacial features. Flat-topped hills dot the heavily forested landscape. These perched lake plains were formed by material left in the depressions within the stagnant glacial margin. Along with the crevasse-fill hogbacks, they resemble the nearby Chippewa Moraine Ice Age Reserve Unit. The section's forests are thick, populated with a great variety of hardwood and coniferous species, blanketing the kettles, kames, and knobs. Hikers and bikers are directed to the section directly east (Mondeaux Dam) for supplies and other needs.

➔The *Jerry Lake* section affords the opportunity to observe secluded and varied hardwood forest in a recently logged part of the Chippewa moraine. Once this area lent itself to trapping, as the Indian and French trappers of the east ranged further afield.

Today the woodland battlefields bear more signs of logging than of tribal warfare. The earliest logging activity in the area occurred along the banks of streams, to facilitate the transport of the timber by water. The Black River to the south was one of the prime western Wisconsin rivers where early logging took place. The first mill on this river was in operation just below Black River Falls only five years after the end of the War of 1812. By 1853 state mills were turning out some 200,000,000 board-feet of pine yearly, and logging was big business.

Many areas of the Trail still offer tangible evidence of the area's logging history, with huge stumps recalling once mighty pine stands. Much of the wooded area is not fully replenished with aspen, birch, maple, ash, white spruce, balsam fir, and swamp conifers. A few tall white pine and hemlock remain. Watch for trillium in the hardwood areas in spring.

Jerry Lake is a good area for wilderness camping.

➔The *Lake Eleven* section follows yellow blazes through a heavily wooded area marked by forested kames and perched lake plains. As with all the sections west of the Mondeaux Flowage, the Trail around 11-acre Lake Eleven is hilly. It is full of logging history, since the railroads penetrated the interior lands between the rivers around 1890. Today balsam fir, aspen, birch, white spruce, and swamp conifers have reclaimed the lowlands, but hardwoods dominate on the highlands.

Be on the lookout for deer, bear, porcupine, skunk, squirrel, ruffed grouse, waterfowl, and many varieties of hawk and songbirds. Pine snakes and other reptiles are frequently observed, with coyote, wolf, and eagle less common but possible sightings.

Wilderness camping is at Lake Ellen. Bass and panfish are found in its 35-foot depth. Chequamegon Winter Sports Area is at this section's end near Perkinstown. Supplies are also available in Perkinstown.

➔The *Beaver Creek* section traverses a heavily wooded area south of the Chequamegon Waters Flowage. Yellow blazes lead the hiker through knobby terrain and past several small streams, ponds, and bogs. At several places in this section the hiking trail follows along the margins of perched lake plains, the latter usually adjoined by swamp-filled depressions. Watch for hawk, red-tailed and other varieties, eagle, bear, coyote, deer, skunk, beaver, and porcupine. From State Highway 64 west occurs another gap in the Trail. The proposed corridor follows little-used

roads to the Chippewa County line and thence to Cornell on the Chippewa River, where the hiking trail starts again.
→The 10-mile Timm's Hill National Trail takes off from where the Ice Age Trail crosses County C and goes due north to Timm's Hill in Price County, Wisconsin's highest point at 1,951 feet above sea level. Surrounded by a 187-acre Price County Park, it is the site of the annual Porcupiner's ski race conducted on the weekend of January 1 (see also the annual Hinderbinder Ski Race north of Rib Lake in mid-February). The trails are groomed for both skate and diagonal-stride skiing.

For information about the Chequamegon National Forest, write District Ranger, U.S. Forest Service, Medford, Wisconsin 54451.

3. Chippewa County to Polk County—Glacial Lakes, the Blue Hills, Dells of the St. Croix

The last 150 miles of the Trail run between two majestic river systems, the Chippewa and the St. Croix. It boasts some of the finest sections—the Chippewa Moraine glacial lakes, the Blue Hills of Rusk-Barron Counties, the 9.5 mile abandoned railroad Tuscobia stretch, the rolling forests and farmland between Highway 53 and the Trail's end at Interstate Park. It also needs a lot of work to close its numerous gaps.

The 25-mile long Trail in Chippewa County is mostly on county forest land, partly in the Chippewa unit of the Ice Age National Scientific Reserve. It crosses streams, beaver dams, glacial ridges, and scores of small lakes and ponds. There are still fine stands of red and white pine and mixed hardwoods, including Wisconsin's largest aspen.

Lakes along the route are full of northern pike, largemouth bass, and panfish. Their shorelines provide good habitat for mallards, wood ducks, blue-winged teal, mergansers, and muskrats. Beaver are everywhere.

Chippewa County (25 miles)
(Map 21, p. 116)
→Start from County CC across the Chippewa River from Brunet Island State Park on Cornell's north side.
→Follow the yellow blazes west, then northwest, 8 miles across the south end of Firth Lake to the Moon Ridge Trail.
→West along the Moon Ridge Trail .5 mile to where the Ice Age Trail leads northwest.
→Northwest around many beaver dams to County Highway E.
→West from County E along the southern edge of Old Bald kame 1.5 miles to the north of Pauls Lake.
→West, then northwest, from Pauls Lake 1.5 miles to join Deer Fly Trail.
→Northwest across Deer Fly Trail three miles, passing the south shores of Harwood Lakes, to Plummer Lake.
→West from Plummer Lake south of Knickerbocker Lake, ending in a circular trail.

For information about the Trail in Chippewa County, contact Lake Wissota State Park, Rt. 8, Box 360, Chippewa Falls, Wisconsin 54729, (715) 382-4574; Prof. Adam Cahow, Rt. 2, Box 222, Eau Claire, Wisconsin 54701, (715) 836-5376.

Another gap of 13 miles occurs before reaching the Blue Hills segment.

Barron-Rusk Counties (33.25 miles)
(Map 22, p. 117)
→The Blue Hills segment runs for 24 miles, starting two miles west of Weyerhaueser, an old logging town.
→North to Murphy Flowage.
→West to Bolger Dam Flowage.
→North along the east side of Red Cedar Lake to Highway 48 just over the line in Sawyer County. The Murphy, Bucks Lake, and Bolger dams on Hemlock Creek were all washed out in the flash flood of May 31, 1980, but are being rebuilt. Watch for the Blue Hills, an ancient pre-glacial quartzite monadnock, with talus slopes of rubble formed by the glacial freeze. The Trail is interrupted in spots; for information, contact Lake Wissota State Park, Rt. 8, Box 360, Chippewa Falls, Wisconsin 54729, (715) 382-4574.
→North of Red Cedar Lake the Trail joins the abandoned railroad grade of the Tuscobia Trail, certified in 1984, for 9.2 miles southwestward to the junction of Highway 53 and Barron County B. The Trail passes numerous small lakes and

wetlands. It may need duckboards in spots in the future.

From Tuscobia west to Interstate Park, some 78 miles, the Trail is non-existent. But present plans for a corridor via Cumberland and Turtle Lake, envisaging the use of abandoned railroad right-of-ways, Barron and Polk County forests, and snowmobile trails, may close this gap in the early 1990s.

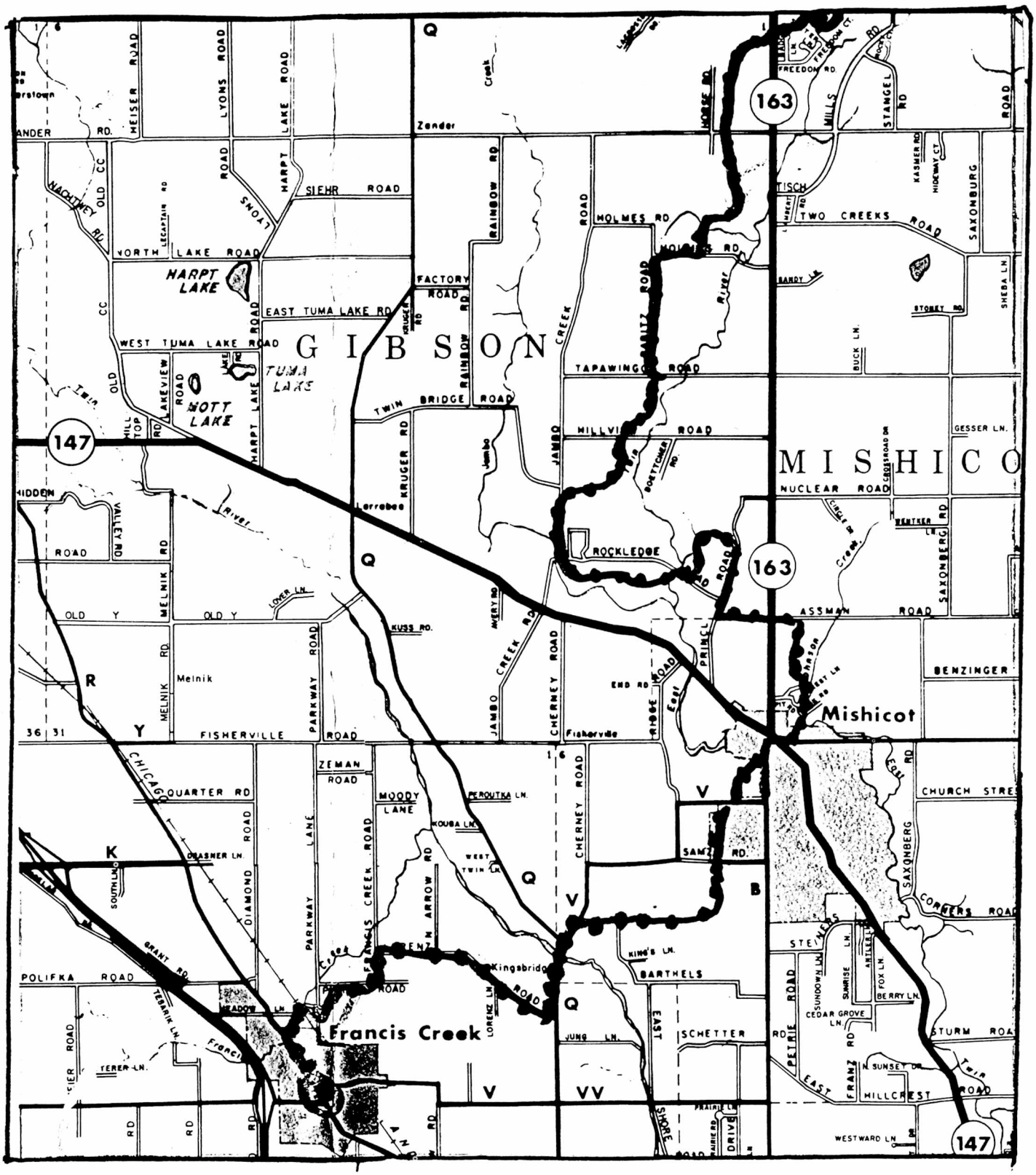
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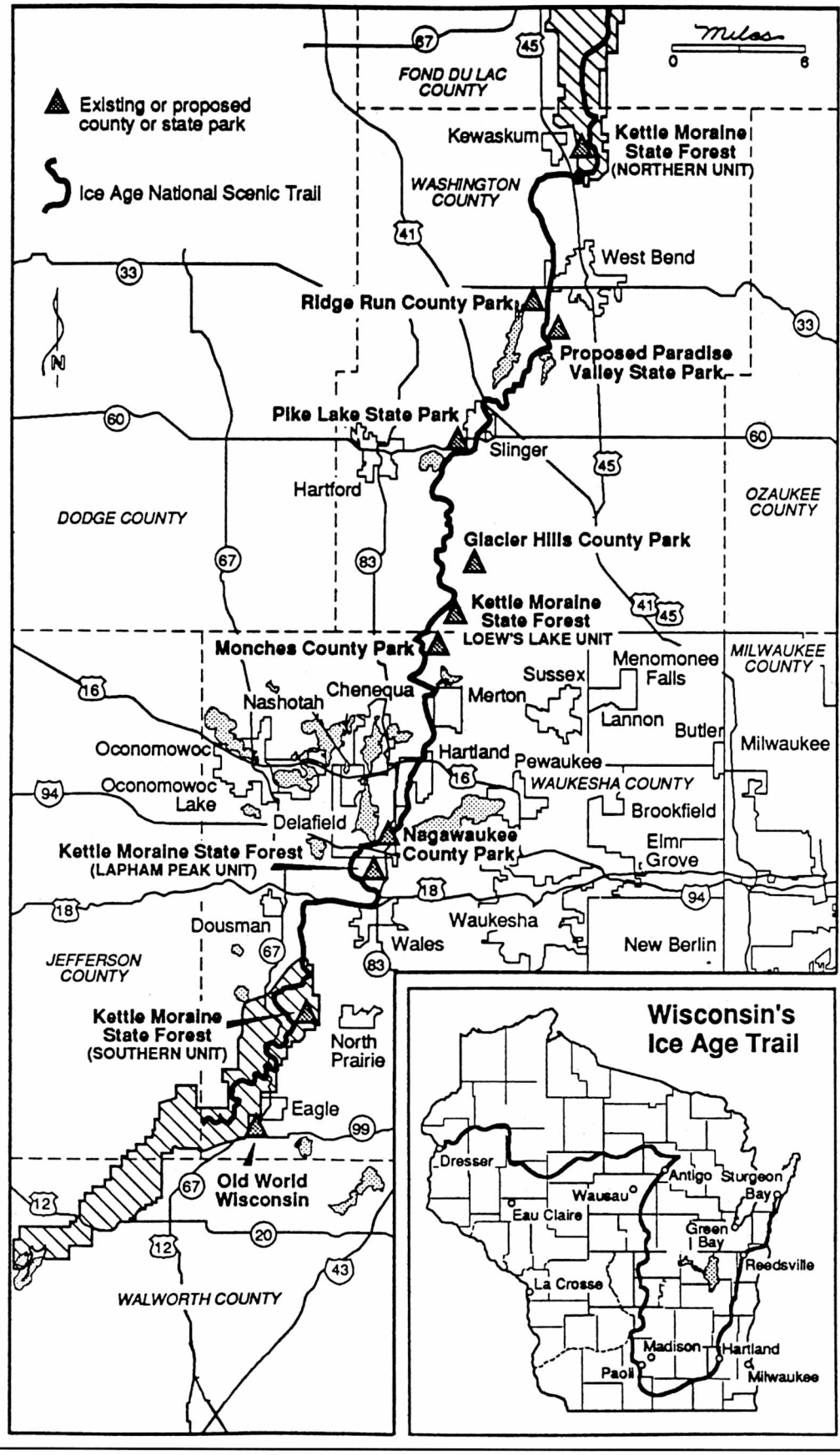
1. DOOR COUNTY / KEWAUNEE COUNTY



2. MANITOWOC COUNTY

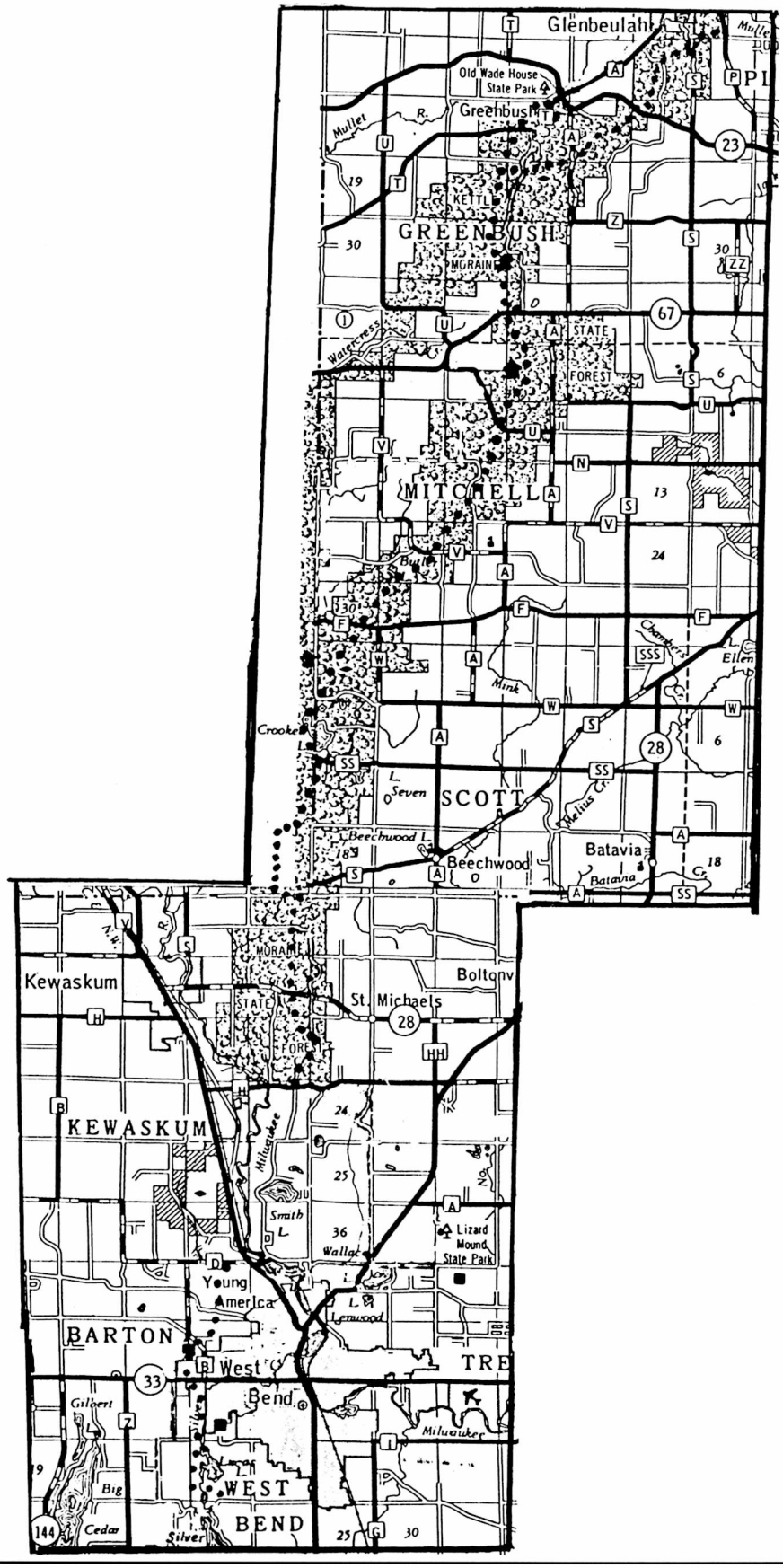


3. THE KETTLE MORAINE

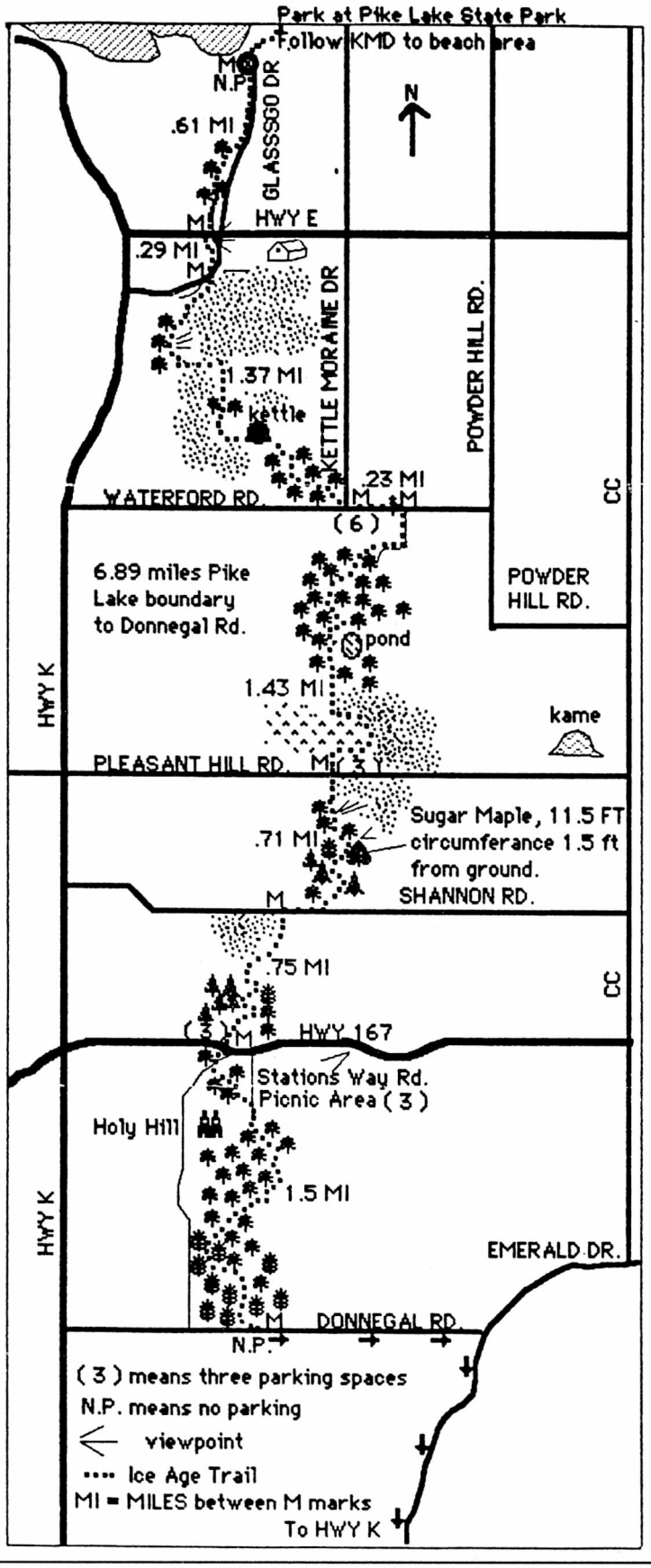


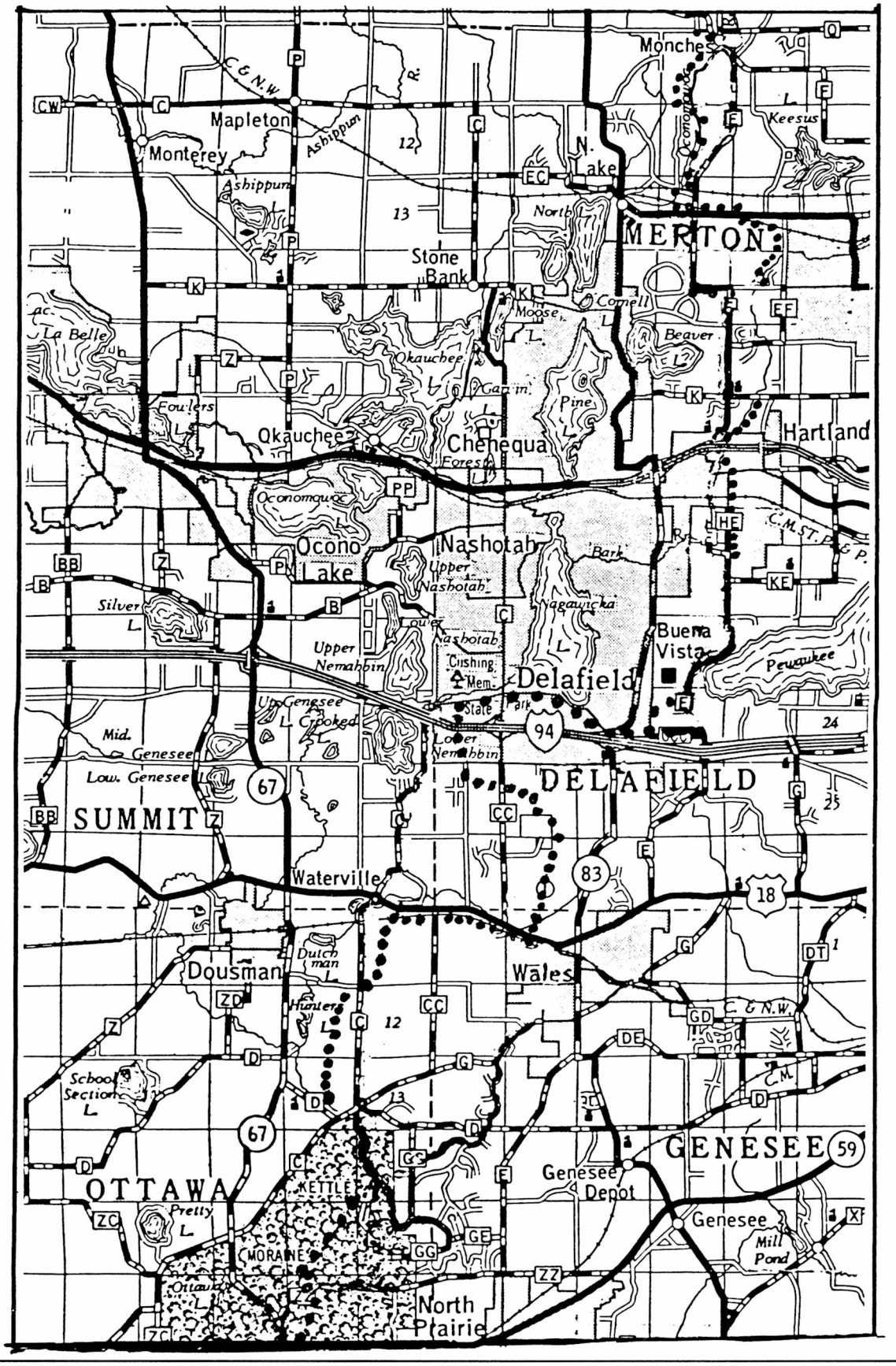
MAP COURTESY OF THE MILWAUKEE JOURNAL

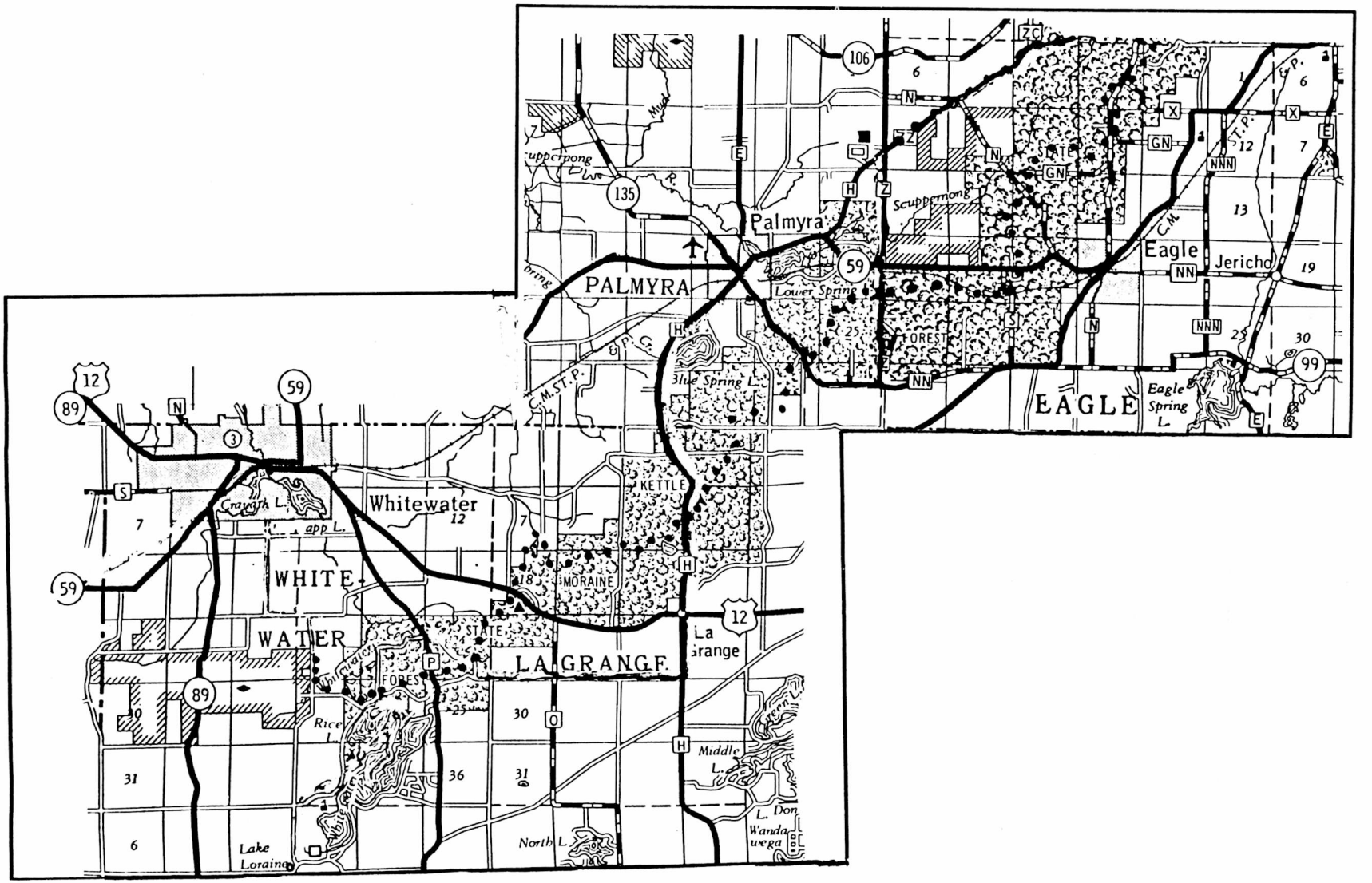
4. NORTHERN KETTLE MORAINE STATE FOREST



5. PIKE LAKE TO HOLY HILL, WASHINGTON COUNTY

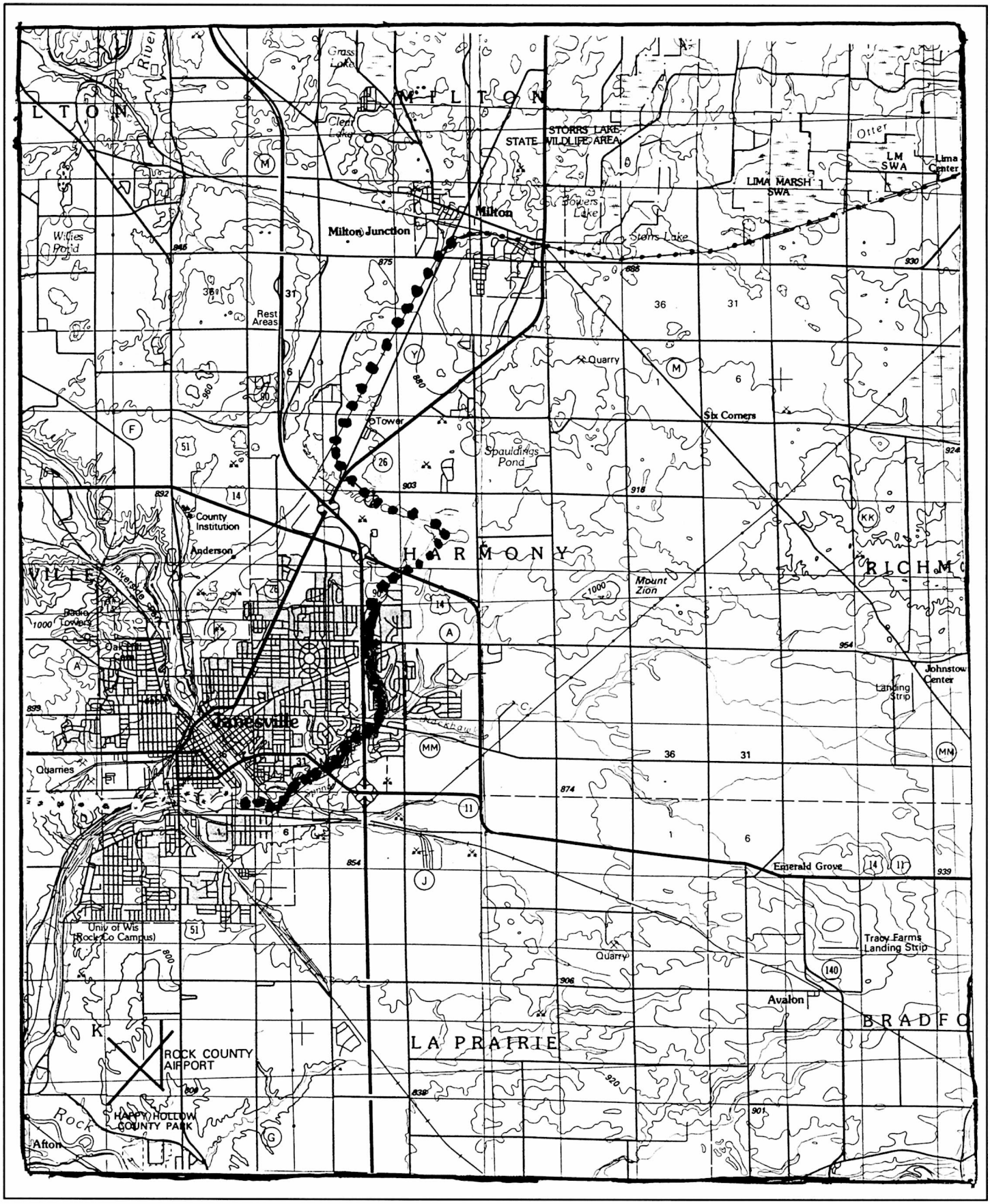



Monches
Mapleton
Monterey
Ashippun
N. Lake
Keesus
MERTON
Stone Bank
Moose L.
Cornell
Beaver L.
La Belle
Okauchee
Fowlers L.
Okauchee
Chenequa
Forest
Pine L.
Hartland
Oconomowoc
Ocono Lake
Nashotah
Upper Nashotah
Lower Nashotah
Bark R.
Nagawicka L.
Silver L.
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Cushing Mem. Park
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Buena Vista
Pewaukee
State
Up. Genesee L.
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Mid. Genesee L.
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Dousman
Dutchman L.
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GENESEE
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Genesee
Mill Pond
Pretty L.
KETTLE MORAINE
Ottawa L.
North Prairie

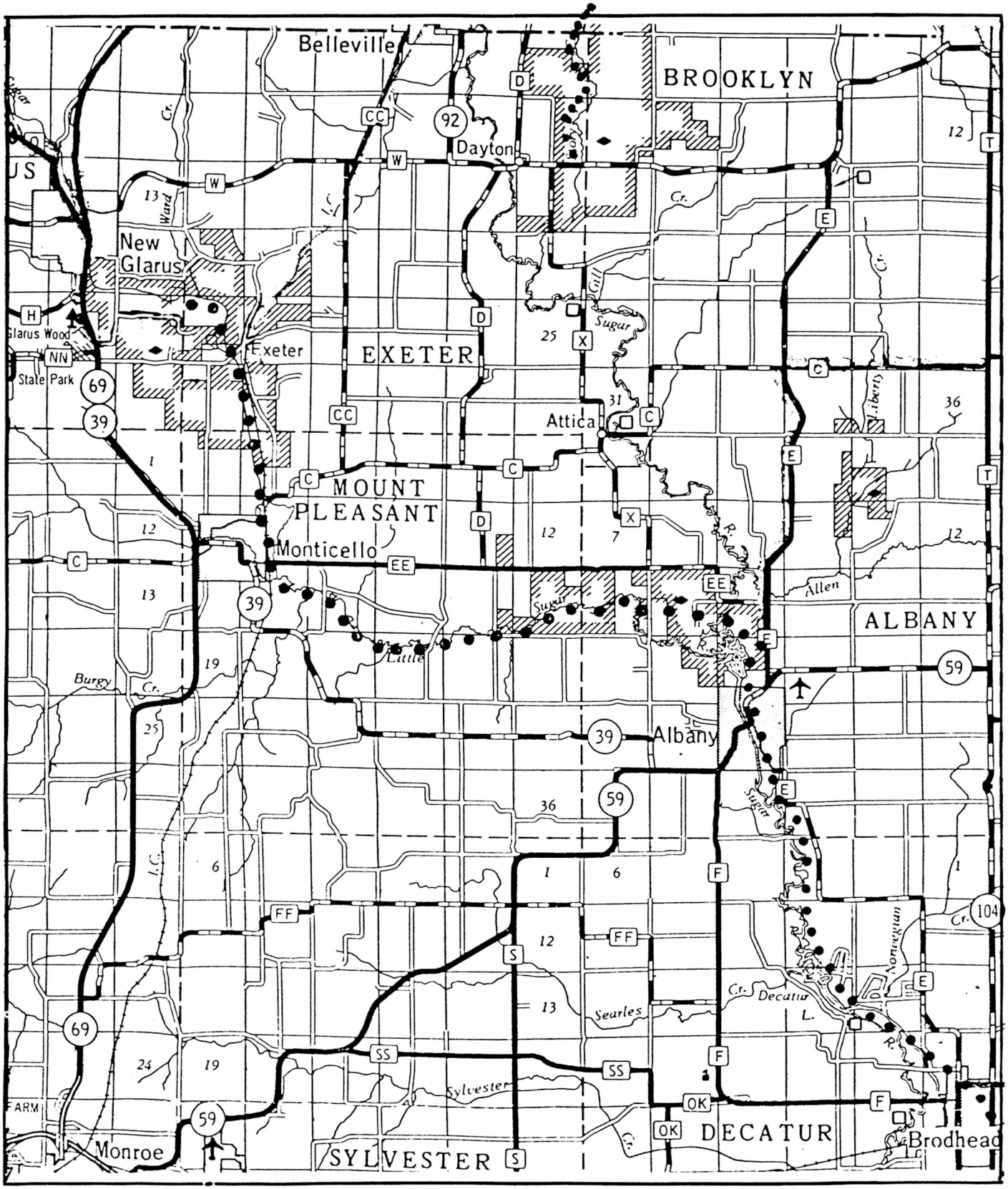


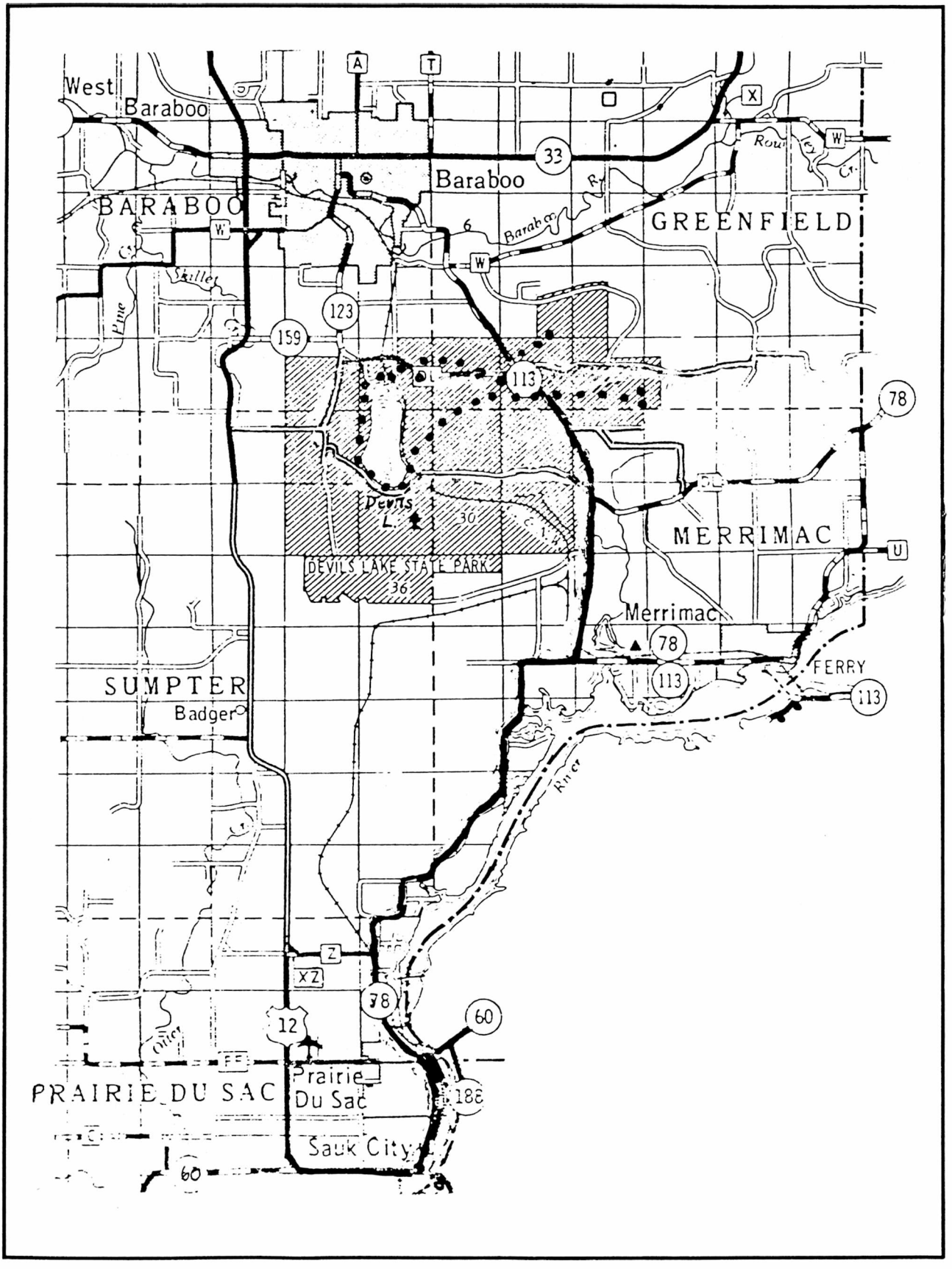
7. SOUTHERN KETTLE MORAINE STATE FOREST / WAUKESHA COUNTY / JEFFERSON COUNTY / WALWORTH COUNTY

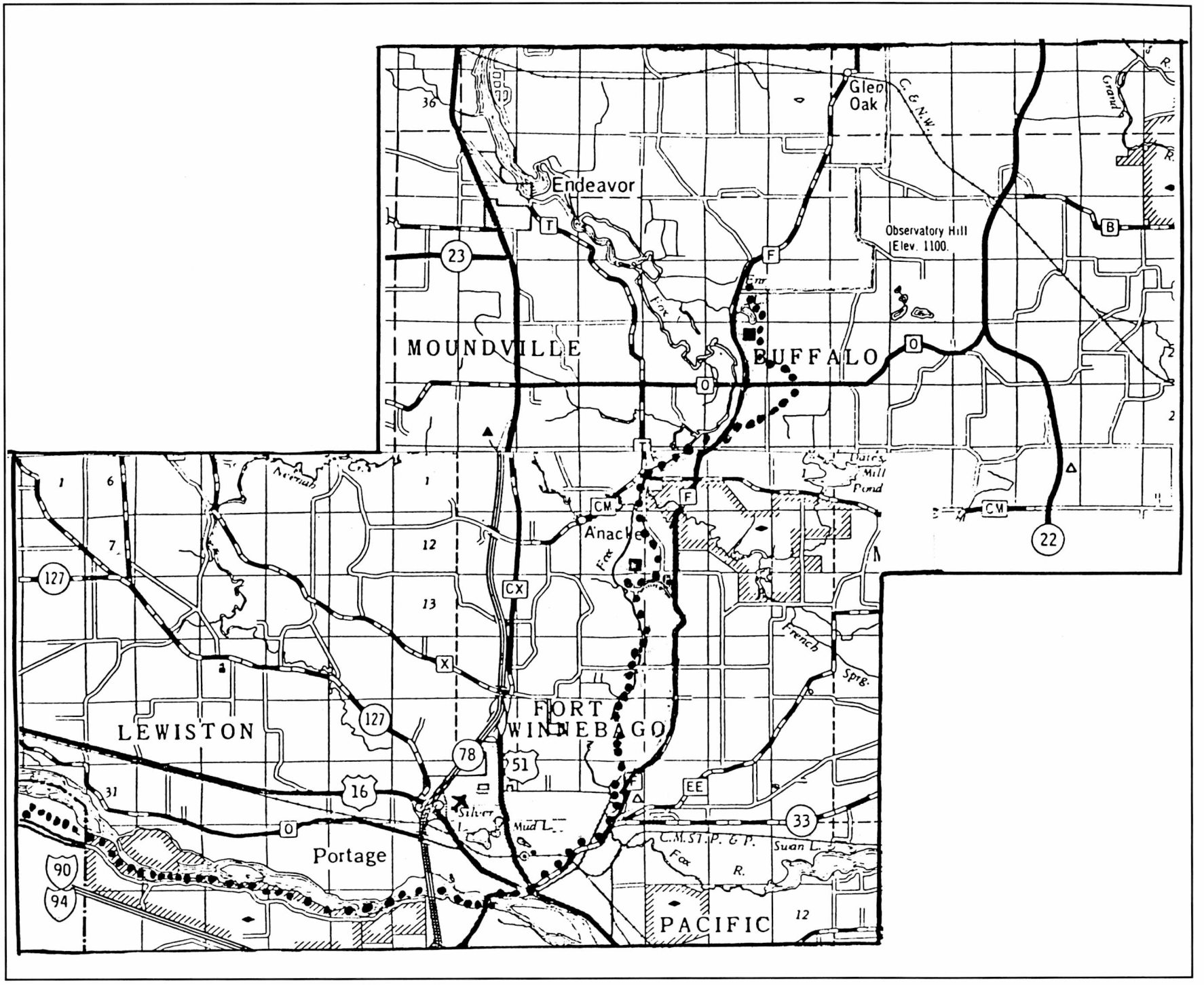
8. ROCK COUNTY



9. GREEN COUNTY




West Baraboo
Baraboo
BARABOO
GREENFIELD
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159
113
78
DEVILS LAKE STATE PARK
MERRIMAC
Merrimac
FERRY
SUMPTER
Badger
12
60
188
PRAIRIE DU SAC
Prairie Du Sac
Sauk City



11. MARQUETTE COUNTY/COLUMBIA COUNTY

12. WAUPACA/PORTAGE COUNTY

Waupaca/Portage County Segment
Hiking and cross-country skiing trail

Legend

- Bike Route
- Ice Age Trail

Mileage Chart

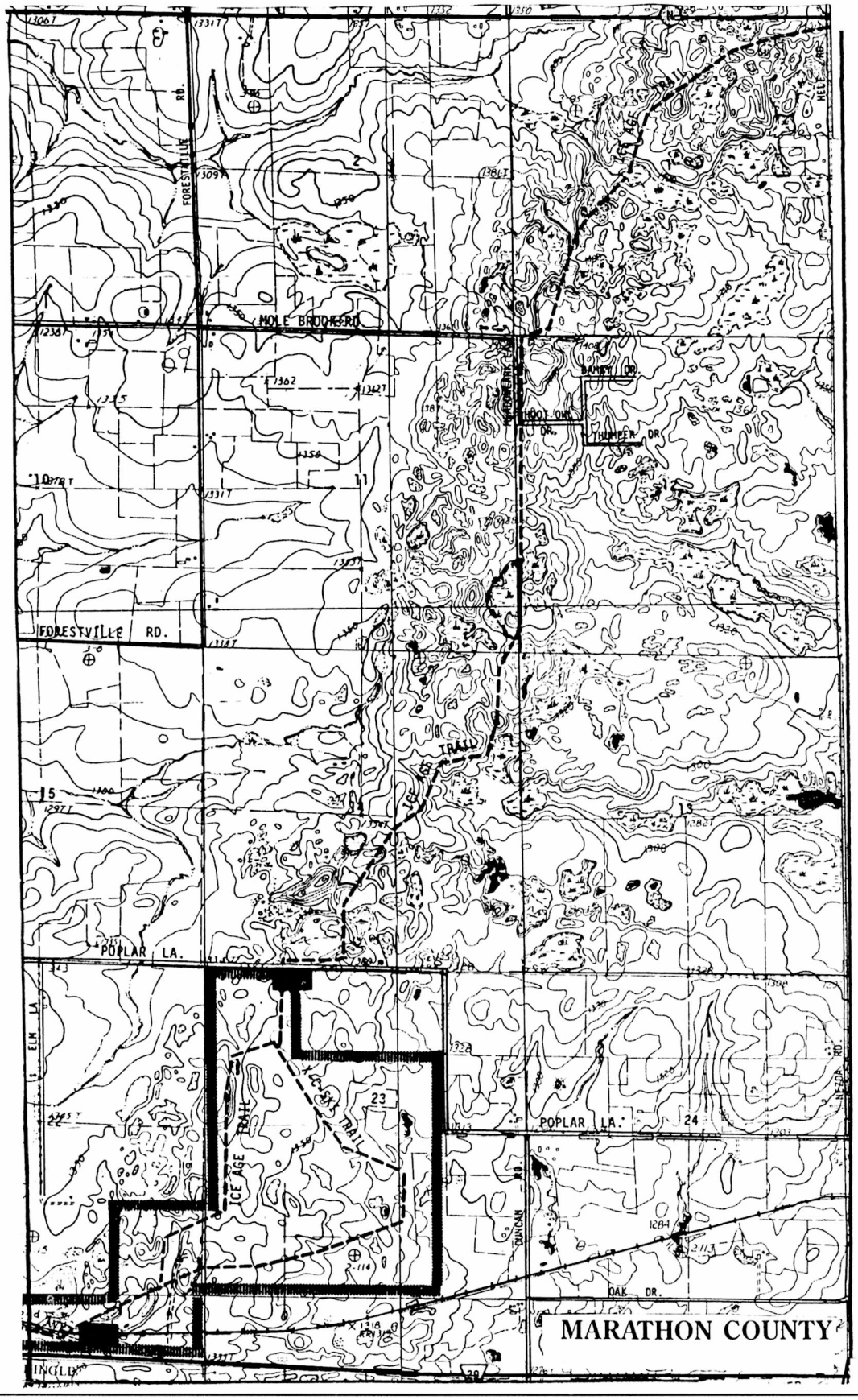
2nd Avenue to Stratton Lake Rd.	1.4 miles
Stratton Lake Rd. to Emmons Creek Rd.	.8 miles
Emmons Creek Rd. to Windfeldt Lane	2.5 miles
Windfeldt Lane to Edminster Rd.	1.5 miles
Edminster Rd. to Highway 54	1.4 miles
Highway 54 to Frost Valley Rd.	1.4 miles
Frost Valley Rd. to Cobb Town Rd.	.6 miles
Cobb Town Rd. to Foley Rd.	.3 miles
Foley Rd. to Log House	.3 miles
Log House to Hwy 10	1.5 miles
	11.7 miles

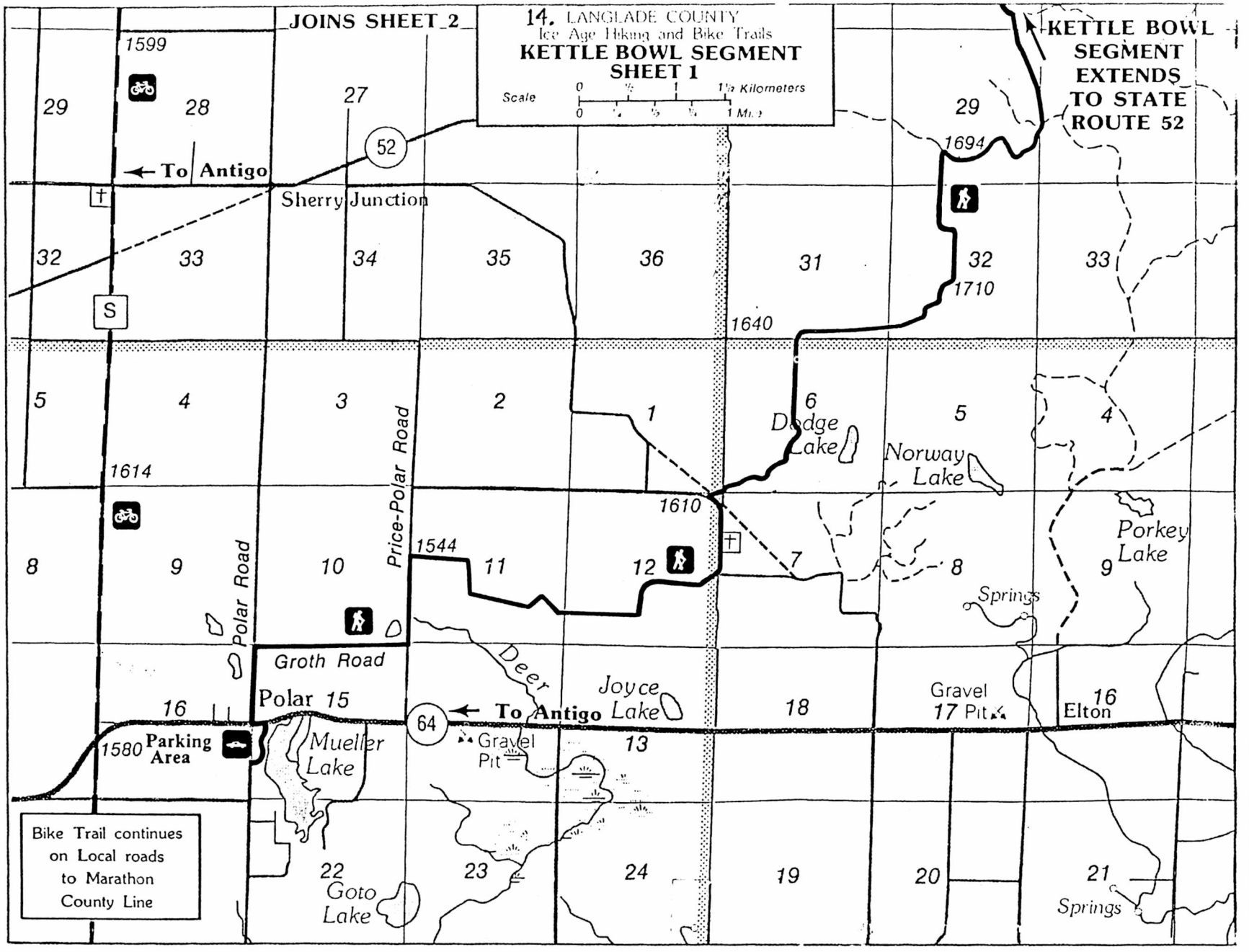
Cabin

Use of the cabin is by hike-in only, first come, first serve.

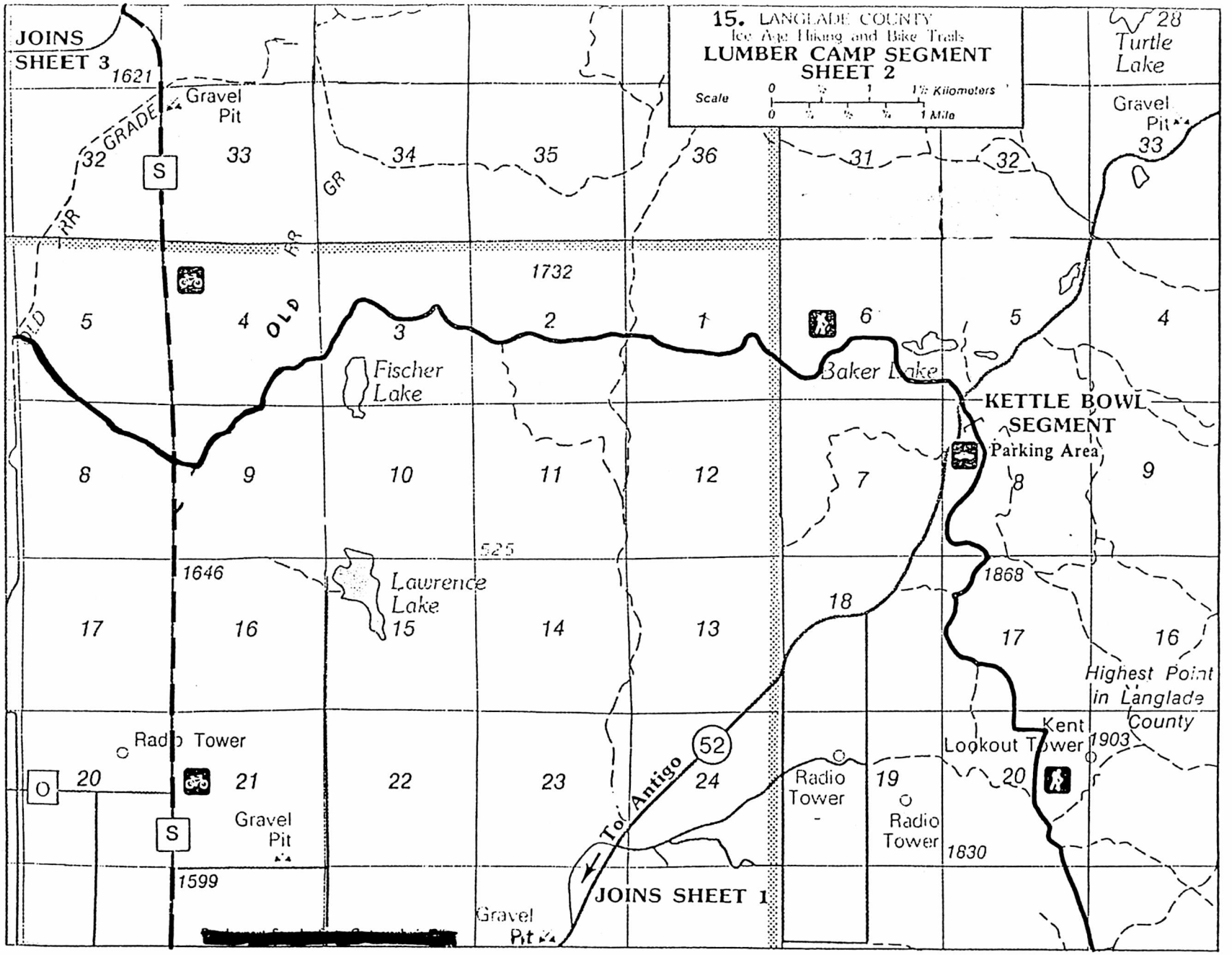


13. MARATHON COUNTY

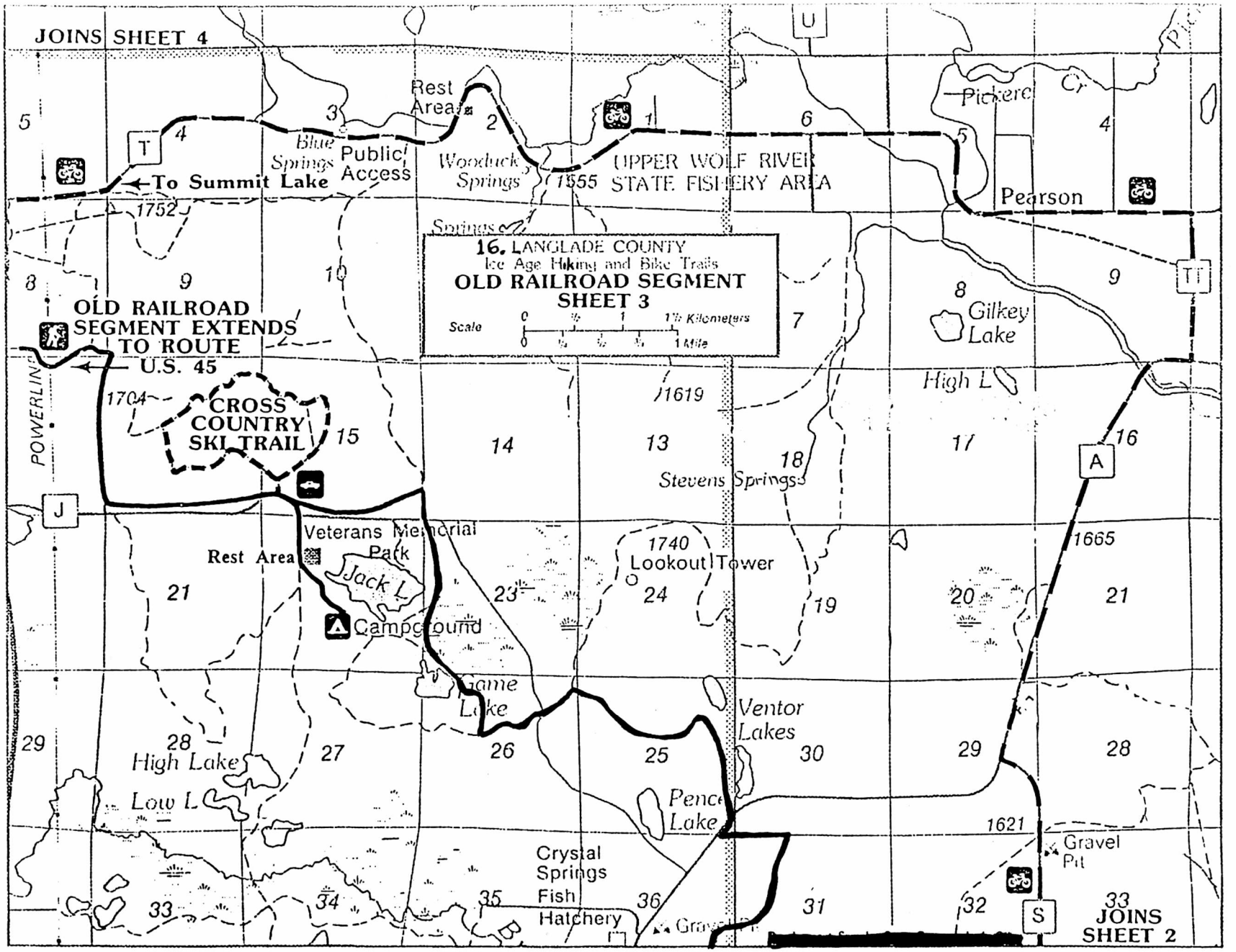




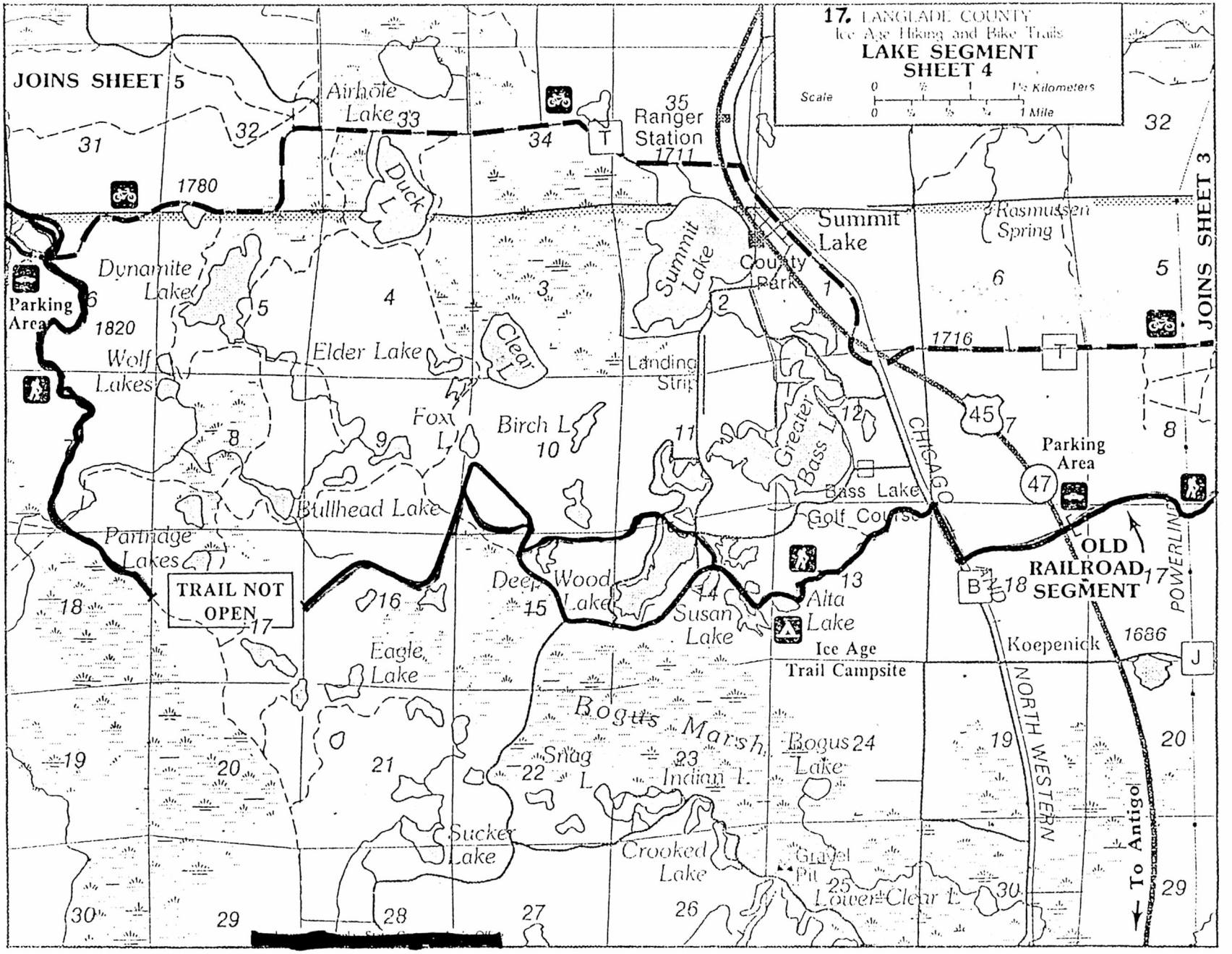
14. LANGLADE COUNTY KETTLE BOWL SEGMENT SHEET 1



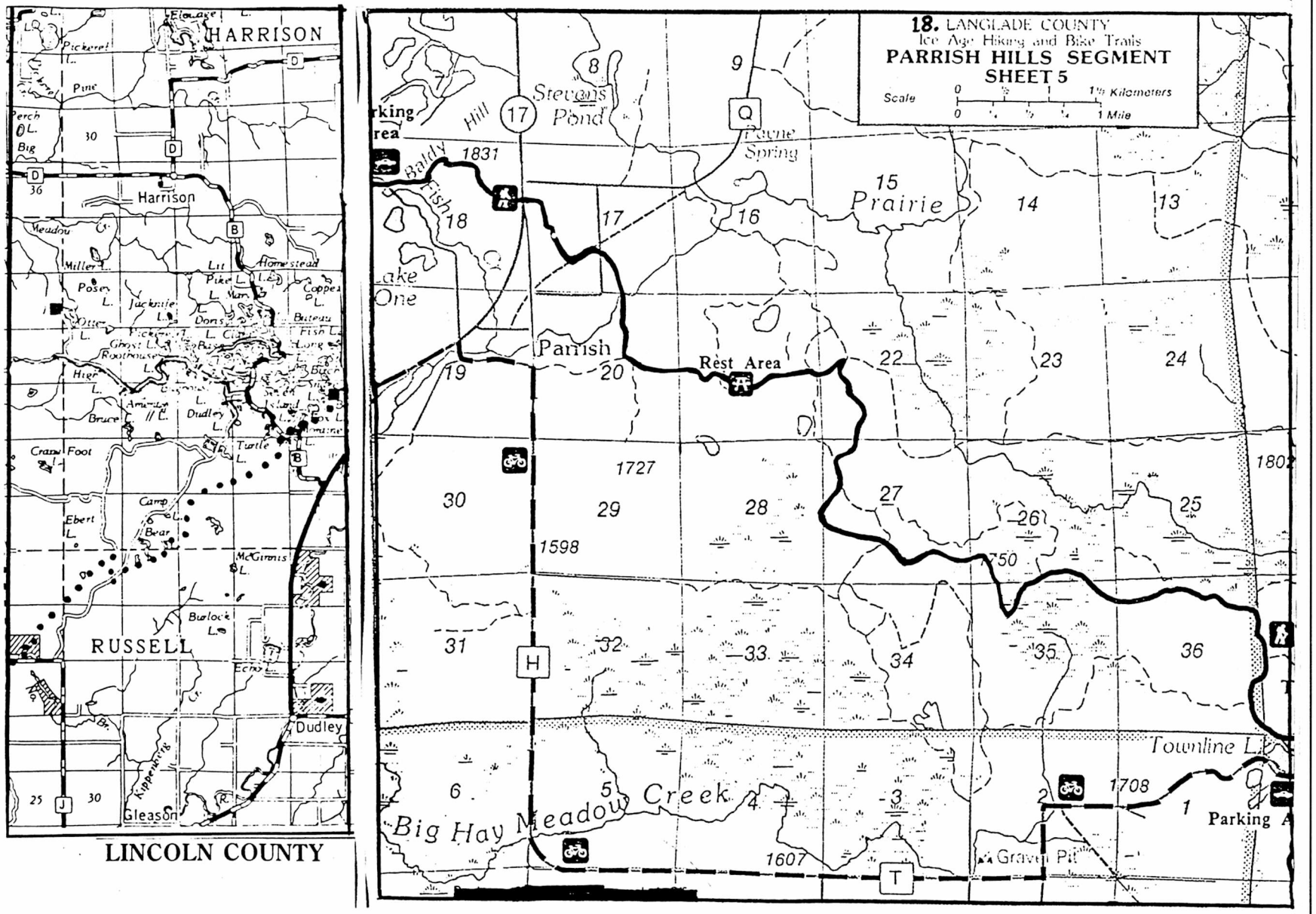
15. LANGLADE COUNTY LUMBER CAMP SEGMENT SHEET 2



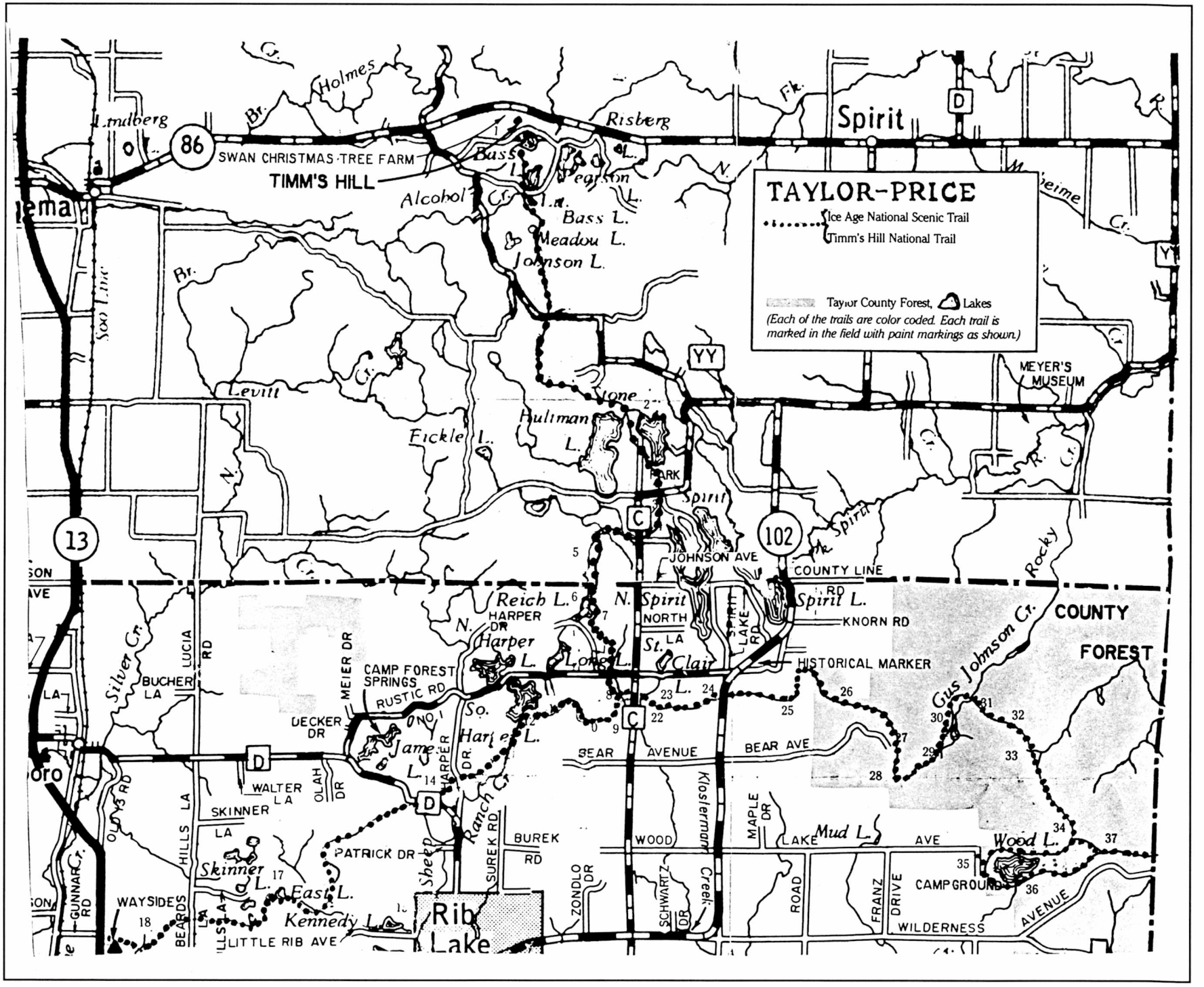
16. LANGLADE COUNTY OLD RAILROAD SEGMENT SHEET 3



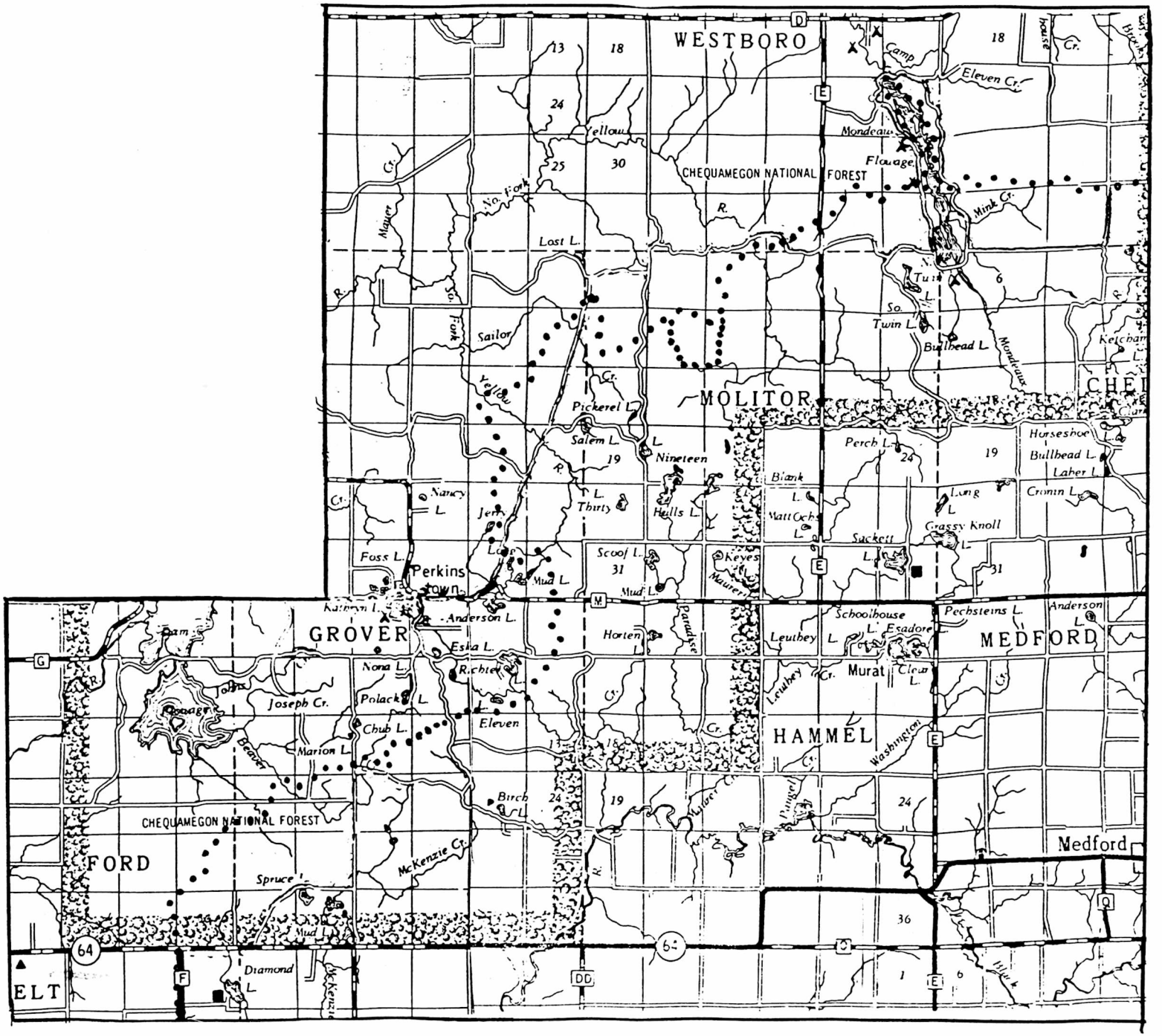
17. LANGLADE COUNTY LAKE SEGMENT SHEET 4



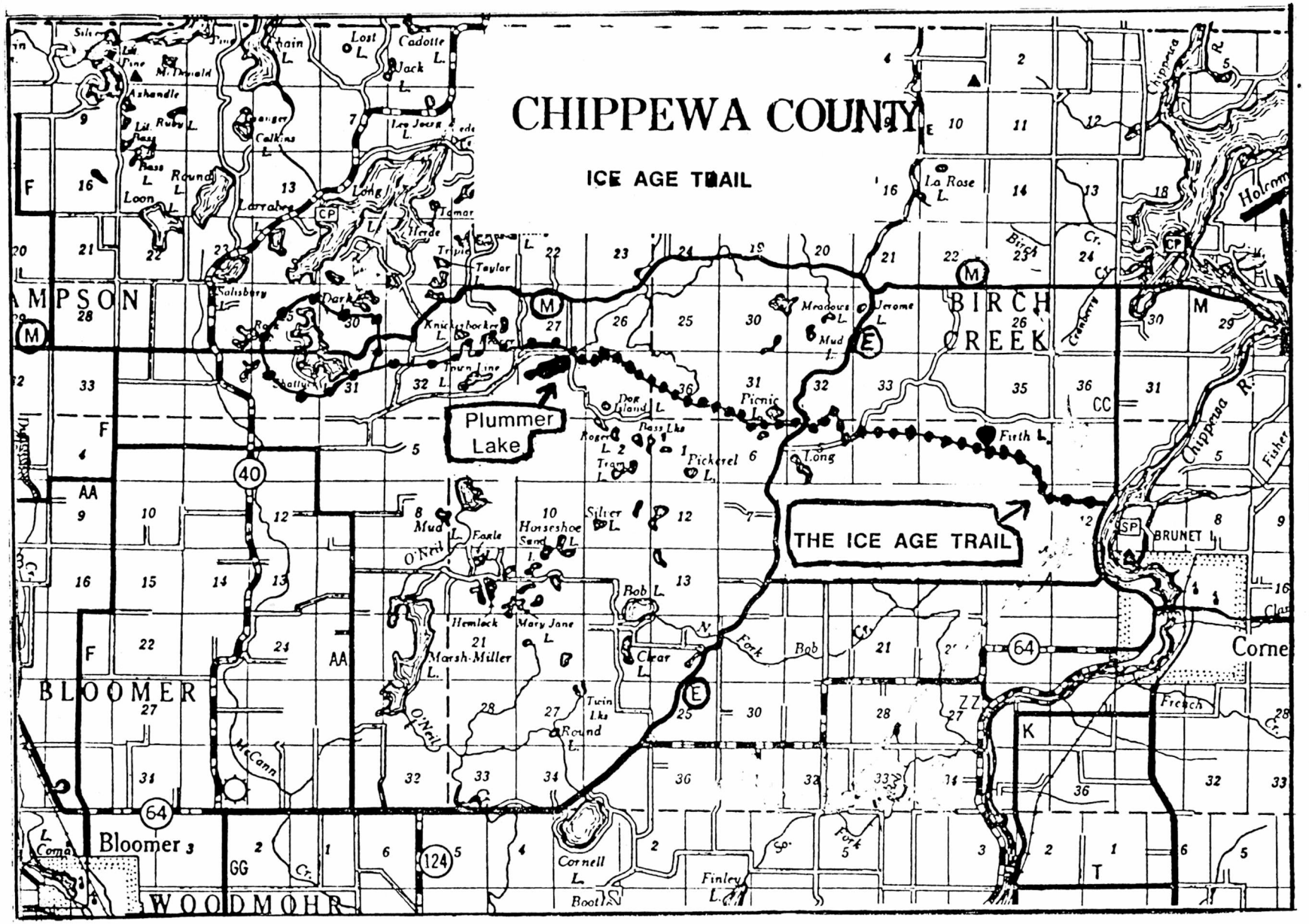
18. LINCOLN COUNTY/LANGLADE COUNTY PARRISH HILLS SEGMENT SHEET 5



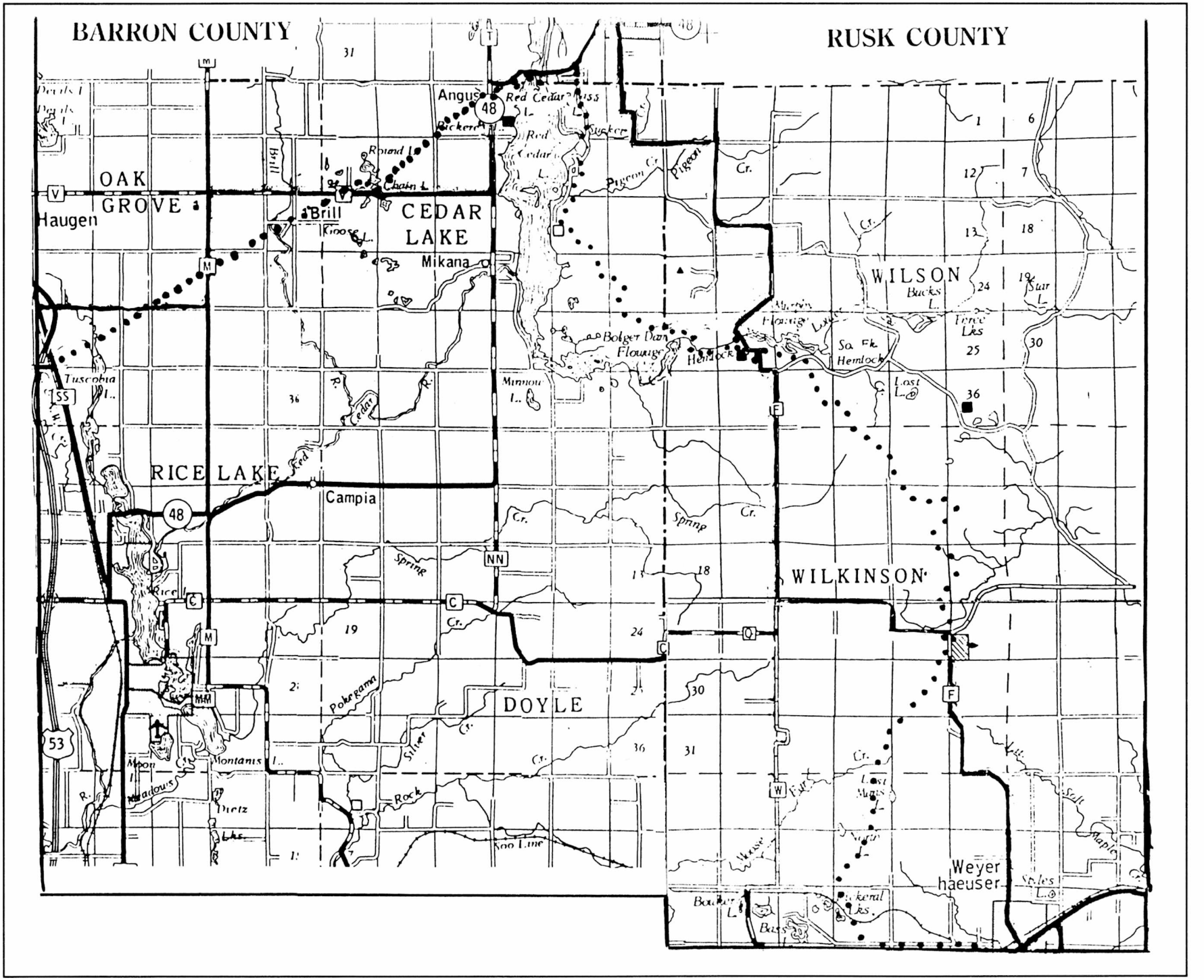
19. TAYLOR/PRICE COUNTY



20. TAYLOR COUNTY



21. CHIPPEWA COUNTY



22. BARRON COUNTY / RUSK COUNTY

About the Author



Henry S. Reuss represented Wisconsin's Fifth District in the House of Representatives from his election in 1954 until his retirement in 1983. He chaired the House Banking, Finance, and Urban Affairs and the Joint Economic Committees, and was author of the Peace Corps, the Federal Reserve Reform Act, and the Mass Transit Research Act.

An enthusiastic outdoorsman all his life, in the 1960s Reuss set up the Congressional Subcommittee on Conservation, which helped lead the fight for protecting the national parks, cleaning up our waters, and preserving wetlands. The Wildlife Federation named him Conservationist of the Year.

Reuss has hiked many famous trails, including the Appalachian in the East, the Lewis and Clark in the West, the St. James of Compostella pilgrimage trail in France, and the Black Forest trail in Germany.

Protection for the glacial moraines of Wisconsin, unique in their ability to tell the tale of the Ice Age, was first proposed in 1958. Reuss joined in the fight, and was the legislative sponsor of the Ice Age National Scientific Reserve and the Ice Age National Scenic Trail. This book describes its author's dream of "solitude for the multitude."

Born in Milwaukee, Reuss was educated in Milwaukee schools and at Cornell University and Harvard Law School. He holds honorary degrees from the University of Wisconsin, Marquette University, and Beloit, Ripon, and Swarthmore Colleges. Since his retirement from Congress, he has served as co-chair of the National Commission to Preserve Low-Income Housing; as president of the Wisconsin Housing Partnership; as a vice-president of the Ice Age Park and Trail Foundation; and as director of the Enterprise Foundation, the Committee on Developing American Capitalism, Former Members of Congress, and the Committee on the Constitutional System. He is a member of the American Academy of Arts and Sciences and of the Wisconsin Academy of Sciences, Arts, and Letters.

He has been married for 48 years to Dr. Margaret M. Reuss.

Addenda

Future improvements on the Trail will be noted in the newsletter of the Ice Age Park and Trail Foundation; you may wish to include changes here.



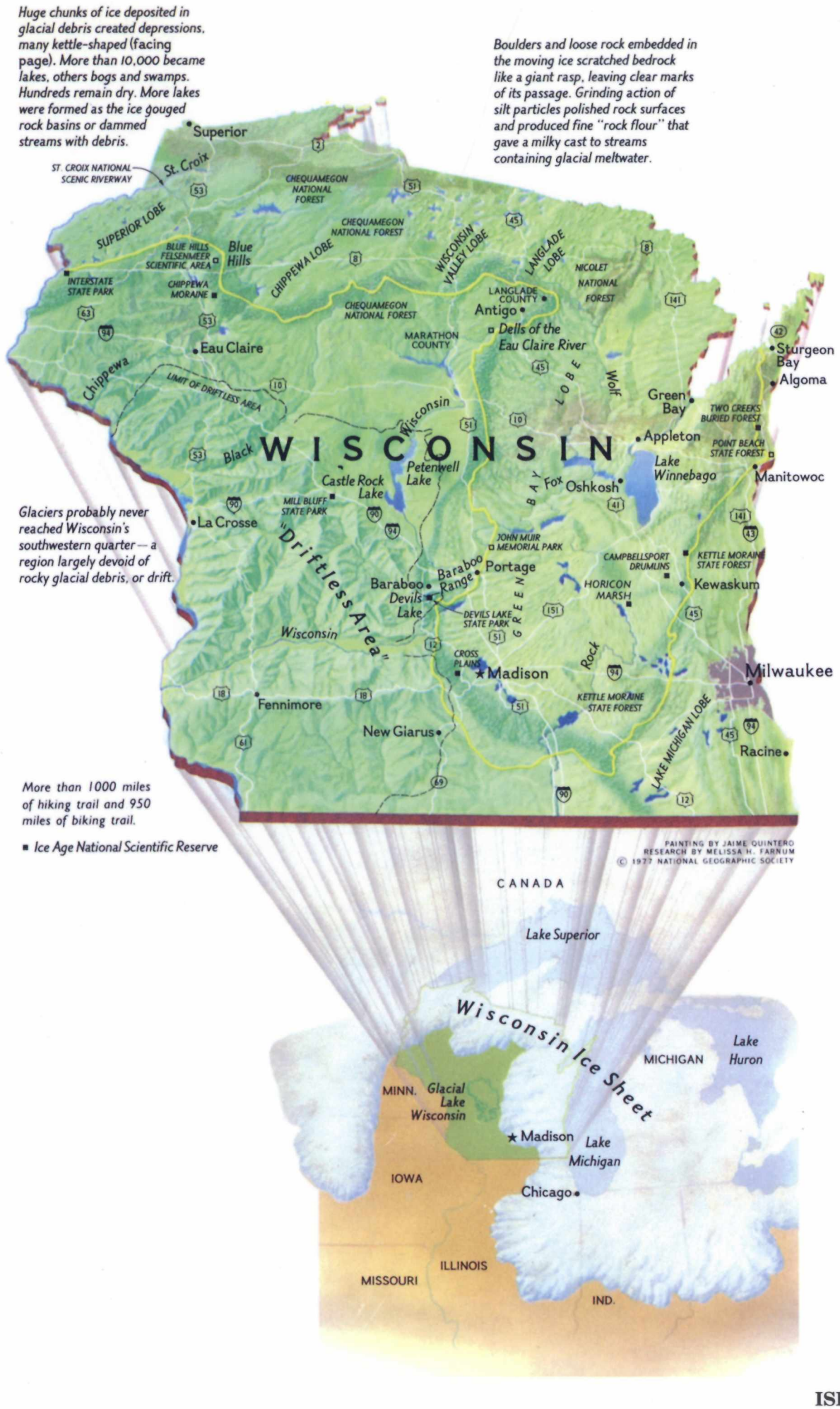
On the Trail of the Ice Age

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by Henry S. Reuss

Published by Ice Age Park and Trail Foundation, Inc.
P.O. Box 422
Sheboygan, WI 53082-0422

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Huge chunks of ice deposited in glacial debris created depressions, many kettle-shaped (facing page). More than 10,000 became lakes, others bogs and swamps. Hundreds remain dry. More lakes were formed as the ice gouged rock basins or dammed streams with debris.

Boulders and loose rock embedded in the moving ice scratched bedrock like a giant rasp, leaving clear marks of its passage. Grinding action of silt particles polished rock surfaces and produced fine "rock flour" that gave a milky cast to streams containing glacial meltwater.



Glaciers probably never reached Wisconsin's southwestern quarter — a region largely devoid of rocky glacial debris, or drift.

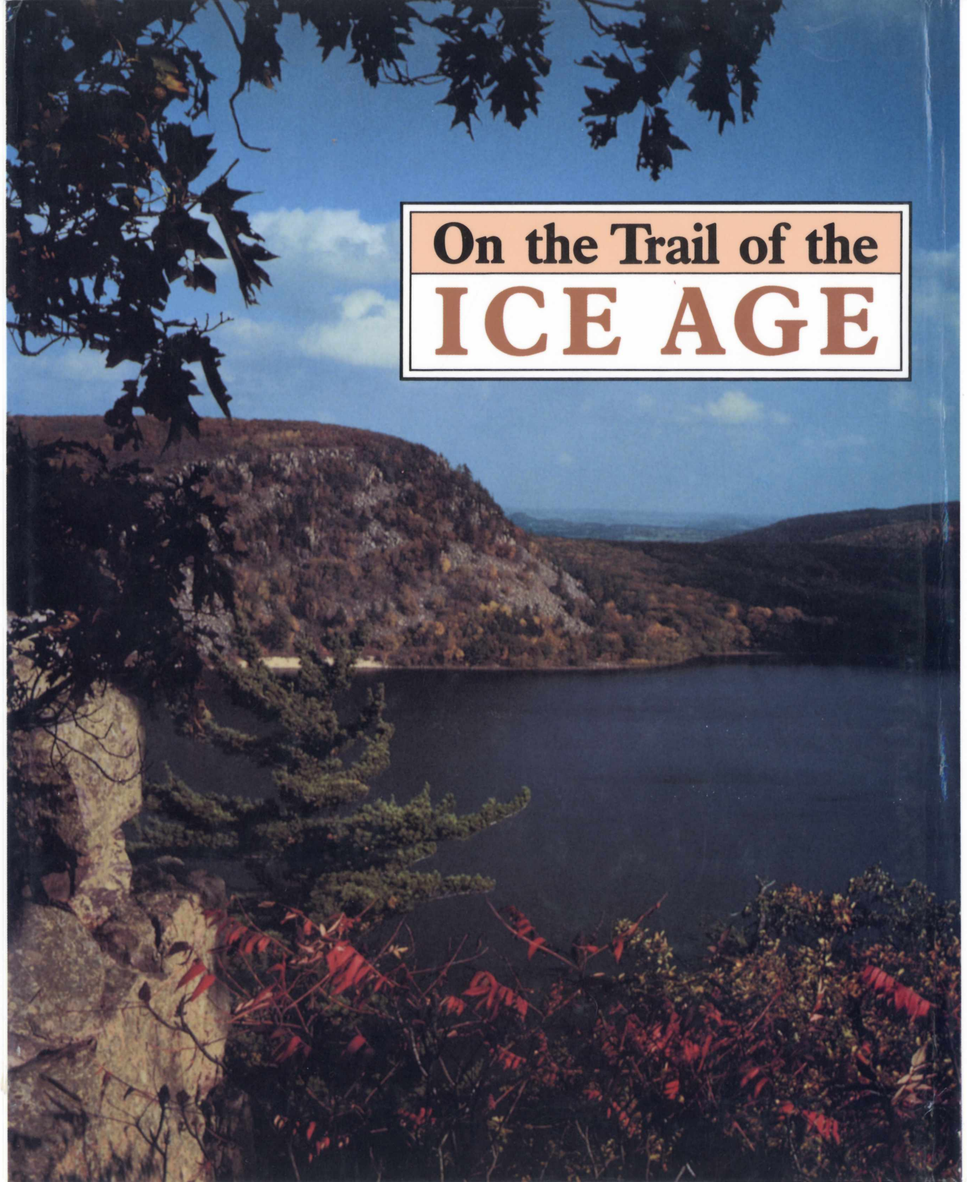
More than 1000 miles of hiking trail and 950 miles of biking trail.

▪ *Ice Age National Scientific Reserve*

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RESEARCH BY MELISSA H. FARNUM
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ISBN 0-9627079-0-2

On the Trail of the ICE AGE • Henry S. Reuss



On the Trail of the ICE AGE

On the Trail of the Ice Age is a guide for the hiker, biker, cross-country skier, and motorist who wants to visit Wisconsin's Ice Age country. This is the planet's most notable collection of the deposits left by the retreating glaciers ten thousand years ago. Here are the moraines, hills ground up by the lobes of the melting glacier; peak-like kames; snake-like eskers; cigar-shaped drumlins; and thousands of glacial lakes, swamps, and kettle-holes.

The visitor can find these deposits assembled in the Ice Age National Scientific Reserve, nine areas ranging from Two Creeks Buried Forest, the Campbellsport drumlins, the Kettle Moraine, the vast waterfowl paradise known as Horicon Marsh, Devil's Lake (where the glacier and the bedrock were locked in mortal combat), the driftless area that the glaciers missed, and the picturesque dells of the St. Croix River. Along the way you may traverse the Ice Age National Scenic Trail, following the moraines for a thousand miles from Green Bay to the Minnesota border.

More than just a guide, the book tells the story of the 30 years of citizen-government cooperation behind the Reserve and the Trail; the place of Wisconsin's Ice Age in the world's glacial history; the "birds, bees, beasts, trees, butterflies, bugs, and boulders" to be met along the way; and some of the fascinating men and women who were nurtured by the land of the Ice Age—Father Marquette, John Muir, Aldo Leopold, Frank Lloyd Wright, Thorstein Veblen, Frederick Jackson Turner, Carl Schurz, Bob La Follette, Georgia O'Keefe, Alfred Lunt and Lynn Fontanne.

There are 30 color illustrations, numerous black and white illustrations, and 25 maps.