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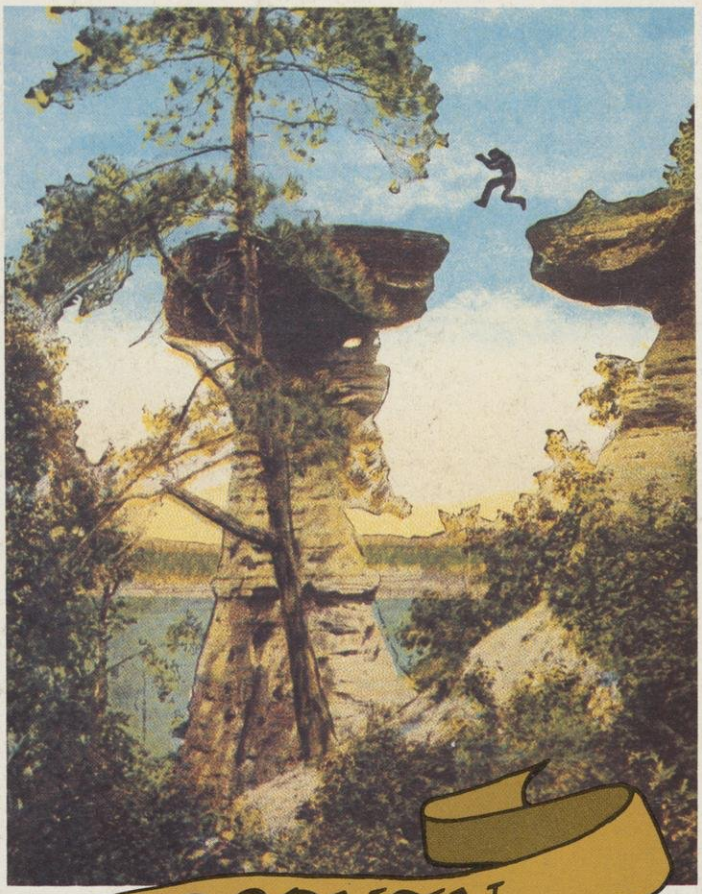
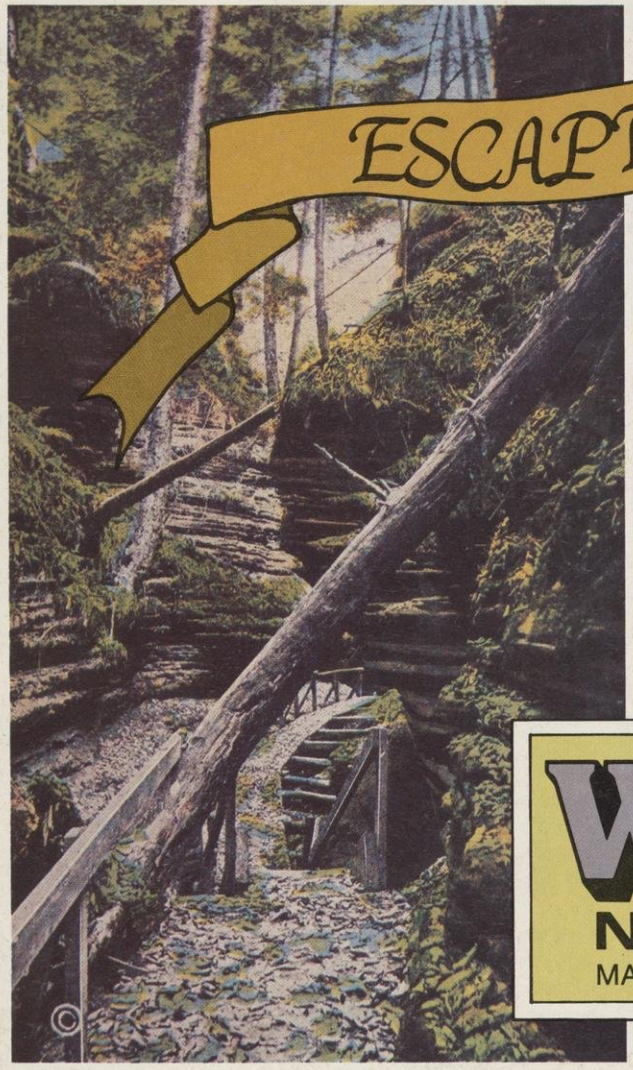
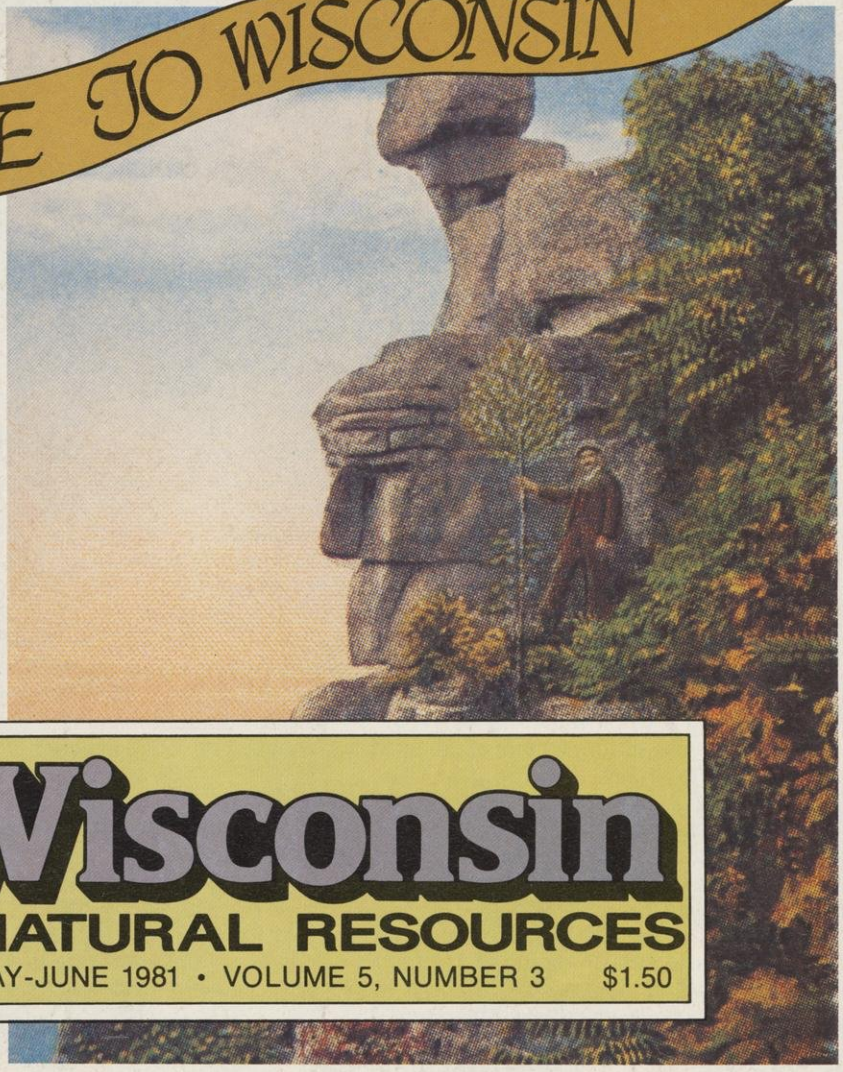


ESCAPE TO WISCONSIN





Wisconsin NATURAL RESOURCES

MAY-JUNE 1981 • VOLUME 5, NUMBER 3 $1.50

Avian theatrics

MICHAEL MOSSMAN
DNR, Office of Endangered & Nongame Species

It's a performance worthy of a virtuoso: the plaintive call, the fluttering wing, the wounded flapping. Poor thing! You try to help but the bird always manages to keep a few steps ahead. Then, suddenly, the denouement: it stops, stands up straight and healthy and flies off, circling back to its nest. You've just been had, by the marvelous, instinctive trickery of the killdeer, mistress of the art of subterfuge.

Most birds have simpler ways to protect their young and ensure survival of the species. Some nest in inaccessible places. Some are fierce defenders. But not the killdeer. This bird lays its well-camouflaged eggs in a small depression in gravel or nearly-bare soil. It often chooses vulnerable, unprotected places like beaches, parking lots and cultivated fields. To keep predators from discovering their eggs, killdeers distract would-be nest robbers by running about feigning a broken wing. The female performs most of the theatrics, although her mate may run or fly nearby, calling excitedly.

Chicks are as well-camouflaged as the eggs. They scurry about and feed themselves shortly after hatching. When danger threatens, they "freeze." Such adaptation helps the killdeer thrive where other birds cannot, in open, sparsely vegetated agricultural, industrial and suburban areas. Killdeers even nest on flat rooftops!

One of the first birds to come and the last to leave, killdeers usually arrive in Wisconsin early in March and linger into November. May and June is when you're likely to find them nesting. Then, if you're lucky, you might witness a performance. It's a show that's survived the ages.

Photo by author

Contents

Wisconsin we love you	Gary Knowles	4
A reed in the wind	Gordon D. Orr, Jr.	7
The prairie garden	J. Robert Smith, Beatrice Smith	11
Wisconsin fishing - 1981	Vern Hacker	17
Will Wisconsin's fishing trip?	Jim Addis	19
Fisherman versus hunter	Robert Traver	24
Carnivorous plants of Wisconsin	Cornelia Burr	28

Features

The readers write	26
Catch-all news pages	at pages 16 & 17

Special supplement

Wisconsin summer escape	at page 16

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Front cover:
"Escape to Wisconsin" is a new theme but an old practice as these early Henry H. Bennett photographs attest. Taken at the Dells on the Wisconsin River and at Devils Lake in the 1860's, they adorned picture postal cards for years afterwards. Shown are a steamer coming through The Narrows, Witches' Gulch, the notorious Stand Rock and Stone Face at Devils Lake. For more on the great "Escape" see the supplement at page 16. Photos courtesy of The H. H. Bennett Studio Inc., Wisconsin Dells 53965.

Back cover:
Pitcher plants are elaborately designed to capture and digest insects for essential nutrients. They are only one among Wisconsin's 14 different kinds of carnivorous plants. For details see page 28.
Photo by Cornelia Burr

To live in Wisconsin is to live near water. We expect it around the next bend, up the road, or just over the hill. Ex-Wisconsinites miss the green springs and cool summers. Photos by author

ESCAPE TO WISCONSIN

Wisconsin, we love you

"Escape to Wisconsin" is more than rootity-toot boosterism. This counts the ways.

GARY KNOWLES

This may be just a story, but there are many who would fight if you said it's not true: Wisconsin is God's winning recipe for the ideal state. There are states that look like great sandboxes, some with majestic mountains, others with a lot of trees, a few with plenty of room to run around in, and even some that are like bowling alleys, but nowhere else are all of these things combined so well as in Wisconsin.

To make a "Wisconsin," you start out with a huge hunk of land. Freeze it under a couple miles of ice. Thaw and repeat. Let the ice melt into thousands of lakes. Toss in plenty of seeds for great trees, prairie grass, flowering shrubs and flowers. Let it stand a few thousand years. Mix in animals. Deer, bear, otter, wolves — a few of whatever you have running around. And birds. Lots of birds in lots of sizes and colors. Add some people. Life-loving, friendly, hard-working, appreciative people to look after it all. Change the weather frequently to keep it interesting. With proper care, it will serve millions.

The recipe has been well-received over the years.

By 1980, the people had even developed a kind of shorthand way to remind themselves of how good Wisconsin is and to invite others to try it. "Escape to Wisconsin," they said. "Escape to Wisconsin."

If you could put them end to end, the 600,000 "Escape to Wisconsin" bumper stickers would stretch from the Capitol Building in Madison to a point past Wausau, 134 miles away. But you can't do that because the stickers are scattered across the state, around the country, and throughout the world. Most are on car bumpers, but they have also been spotted on canoes, trucks, sailboats, bicycles and tractors, not to mention luggage in airports.

The bumper stickers were part of a promotional campaign initiated by the Wisconsin Division of Tourism in 1980. The Wisconsin tourism industry (over 32,000 small businesses) donated hundreds of "vacation experiences" (tickets to attractions and events, lodging, meals, etc.) which the Division organized into vacation packages to be awarded to randomly selected owners of vehicles sporting the "Escape to Wisconsin" stickers. By the end of summer, 1980, almost 80 vacation packages had been given away.

"The Escape stickers were really a hot item," says Don Woodruff, Executive Director of the Division of Tourism. "Even though everyone wanted to be rewarded with a vacation package, most people felt the bumper sticker was a reward in itself. Our initial expectation was that 400,000 would be a year's supply, but they were gone in about three months. We ordered another 200,000 in July (1980) to last through the end of December. Now they're gone and the demand is even greater!"

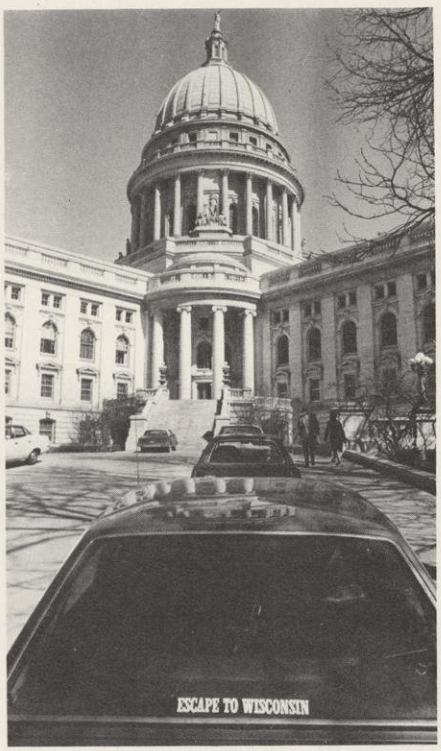
It was Woodruff who developed the bumper sticker promotion idea. He chose "Escape to Wisconsin" because it reinforced the Division's advertising message, and because it "provided a common theme for all the state's tourism organizations and businesses to rally behind."

Of course, some people applied their own creative touches to the stickers. Careful scissors work yielded "Escape Wisconsin" and "Escape to Sin in Wisconsin," but Woodruff is not upset. "We knew that would happen," he says. "The important thing, from the promotional perspective, is that Wisconsin gains in recognition. It's the old show business axiom — mention my name however you like, just get the spelling right!"

The promotion has now entered the spin-off stage. Department of Development industrial consultants use the slogan on promotional literature. Tourist businesses and organizations use it in advertising. There are T-shirts, caps and placemats. And another supply of bumper stickers is on order.

Oddly enough, the whole "Escape to Wisconsin" theme which has attracted so many thousands was born trying to lure just one individual to the Badger State. The Stephan and Brady ad agency in Madison was looking for new talent. Facing tough competition from the high paying, fast-paced glamour of life on Madison Avenue in New York, and the laid back allure of palm trees,

The soothing rush down a long falls into a deep, dark pool. Little Manitou Falls, Pattison State Park, Douglas County.



End to end, the 600,000 bumper stickers would stretch 134 miles, from the Capitol building in Madison to Wausau.

hot tubs, and Hollywood on the other, Stephan and Brady came up with an offer: "Escape to Wisconsin." Under that bold headline their ad described the good life, the clean air, the abundance of recreation, the quality of living that makes Wisconsin so unique.

And the responses poured in. From New York to Florida, from Virginia to California, admen wanted to pack their bags and escape to Wisconsin.

Hugh Brady, head of the agency said, "We received responses from twenty-six states. It was the most successful recruiting ad we've ever run."

Then in 1980 Stephan and Brady was chosen to handle the Wisconsin Tourism account. The rest is history.

Psychologists tell us that vacations are an important "escape" from our daily routine — even short, one- or two-day get-aways make us feel refreshed — more excited about the rest of our lives. We have the opportunity to try new things — to stretch our imaginations — to wander about — to see things differently. Maybe this is one of the reasons Wisconsinites like Wisconsin so much. They really do have all these good things. And especially, there is the water.

To live in Wisconsin is to live near water. The state is bounded by the Great Lakes — Superior and Michigan to the north and east — and by the mighty Mississippi to the west. The Wisconsin River bisects the state from the northeast to the southwest. There are 14,927 named lakes covering 970,869 acres. To grow up in Wisconsin is to expect the water to be across the street, up the road, or just over the hill. The gentle sound and quiet motion of water has a soothing effect, perhaps to the extent that it can relieve tension, lessen anxiety. Some say that the people who live in Wisconsin come under its influence, that they have a gentle, good-humored temperament. They say that visitors experience this near euphoric, aquarian feeling.

In the spring, water sounds can vary from the quiet lap of waves on an inland shore to the soothing rush down a long falls into a deep, dark pool. Punctuating Wisconsin's more than 20,000 miles of river and stream are many such falls. Some in the north have spectacular drops of up to 165 feet.

In summer, waters change. The rich, deep colors creating an uncontrollable urge to kick off shoes, soak feet and wiggle toes. All over Wisconsin travelers stop to do just that. Then there is sunrise at Milwaukee's lakefront — ducks drifting downstream on the Tamarack River. Young people, uninhibited, splash and giggle, or maybe just find a real friend and peer into the clear, friendly water.

In fall, it goes glorious, reflects the brilliant color of leaves, becomes fire in water. Like springtime, autumn means prize fish to the patient angler. Indian summer, warm sunshine and rolling waves encourage you to ignore time. The lakes become mirrors to double your visual pleasure.

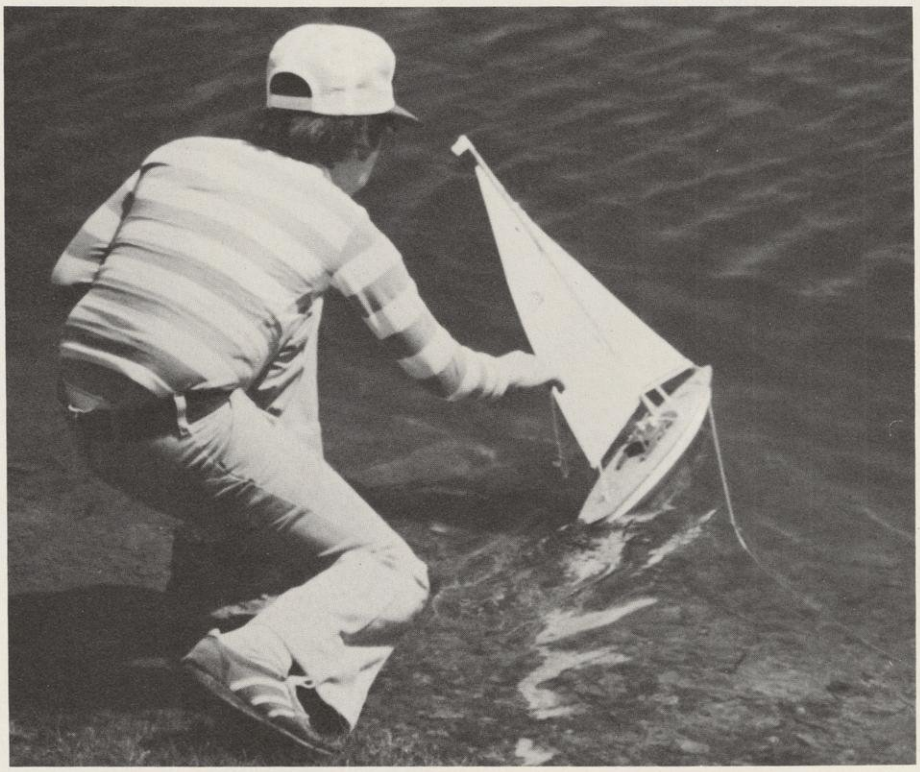
But winter water is special — white snow and ice against bright blue sharp contrast. Most lakes and many streams freeze over for three or four months. Anglers bore holes in the ice. New lightweight clothing and extra leisure coax them out. They come by snowmobile, snowshoes, skis, or just walking and pulling a sled loaded with fishing gear.

And Wisconsin waters are photogenic. A lake, stream, or waterfall in the album renews restfulness. People who live — or have lived — in Wisconsin develop a strong attachment to the state. "There's no place like Wisconsin!" they say. Ask them why and you will get a lot of answers: changing seasons, the lakes, the forests, the rolling hills, the prairie, the people and, often, all of the above.

Take a Wisconsinite out of state for a while and before long he or she will notice something missing. "The leaves aren't changing like they do in Wisconsin. The lakes here are so much farther away than in Wisconsin. There was always a lake nearby. Wisconsin had more snow and whiter. Wisconsin had better snow. Wisconsin was always so green in the spring. The summers were always cooler in Wisconsin."

This isn't to say that Wisconsinites are complainers. They're not. It's just that Wisconsinites are used to a great variety of good things near their homes. The good life is always within reach. "We like it here," they say.

And so do the visitors.



Summer creates an uncontrollable urge to kick off shoes, soak feet and wiggle toes. Young people, uninhibited, splash and giggle in it.

A reed in the wind

Photo by Dale Lang

Photo by author

"The movement of a canoe is like a reed in the wind. Silence is part of it, and the sounds of lapping water, bird songs, and wind in the trees. It is part of the medium through which it floats, the sky, the water, the shores."

from "The Singing Wilderness"
by Sigurd F. Olson

GORDON D. ORR, Jr.,
UW-Madison architect

From times primeval, Native American Indians traveled Wisconsin by birch bark canoe. Later when fur traders penetrated North America, they too adopted this quiet, efficient, transport mode. I grew up along the Connecticut coast, and learned the tidal waters in a sailboat. But later, I discovered the canoe during summers in Maine and have been afflicted ever since. That first one was an Old Town made of wood and canvas. I loved the pleasing lines, the finely crafted ribs and planking and the silent motion I could give it. The craft of the Chippewa became my favorite recreational vehicle.

When I moved to Madison, Wisconsin my first canoe was a 16-foot wood and canvas "Otca" design. Full in the bow, high at both prow and stern, it created a more distinct profile than the lower "guide" type canoes. Our young family liked to paddle it around nearby Lakes Mendota, Monona and Wingra, and on the lakes of the Northern Highland State Forest. As the children grew, we began annual canoe-camping trips to the Flambeau River with my sons and their Madison high school friends.

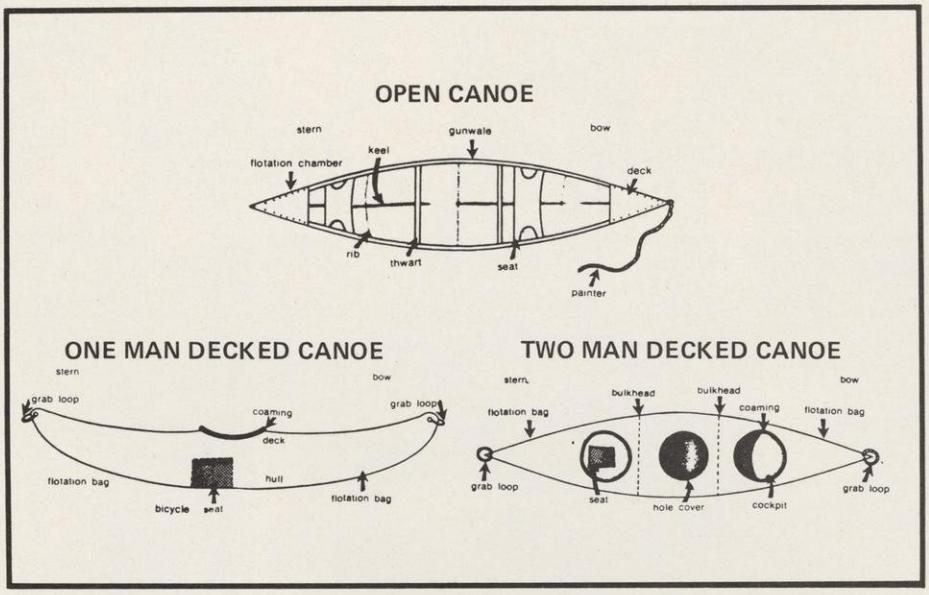
The North Fork of the Flambeau, from Nine Mile Spring down to Big Falls Flowage, is an ideal river for novices — the rapids seem designed for instruction. The leisurely first-day float to the campsite on Babb's Island has a few simple riffles, a single rapid, and a sample of fast water — just enough to give the kids a taste of river canoeing. After that comes increasingly tricky whitewater, but there's always a place where you can pull up the canoe and look over each rapids — a caution any canoeist should take. The trip culminates at roaring Beaver Dam Rapids, the big standing-on-end waves of Pine Island Rapids, and the hospitable Flambeau Lodge. It's a trip I've made many times, over many years, with many different friends and one I've always enjoyed.

On the other hand, the Bois Brule offers its own kind of excitement. Most of the Brule, from Stone's Bridge down to Highway 2, is modest-sized with a series of comfortable rapids. A few bangs and bounces are the most you can expect. Oh, you might take a dunking — unintentionally or otherwise — but the river forgives. It's easy to climb back in the canoe and start over.

The Brule's small size, however, also limits its recreational "carrying capacity." As more people learn to enjoy the river's thrills and beauty, competition among canoeists, anglers, rafters and inner-tubers gets thorny. I often feel a pang of guilt when I round a river bend and disturb a trout fisherman. Why? Because I, too, enjoy fishing and recognize that anglers have as much right to the river as canoeists. I try to

JOIN A GROUP

Canoes are good alone or good in groups and can also be shared with friends. Boy Scouts, Girl Scouts, Sierra Clubs, local canoe clubs are all places to start — any group that lets you make friends with people of common interests, and at the same time helps you learn to handle your craft and gain confidence on the water. There's always more to learn, and a shared trip offers instruction plus fellowship. The first time you encounter whitewater, it's a comfort to stand on shore and let your experienced friends go first, plotting a course through chutes, around boulders and into open water. Many of these organizations have competent leaders willing to impart the fruits of their experience. Group trips add the dimension of joint campfire cooking, after-dinner stories and the tightening bond of shared experience. Friends can help you select equipment, and fill your trips with great personal enjoyment.



give them as wide a berth as possible, and hope most other canoeists do the same.

Rubber rafts and inner tubes are another story. Because rafts and tubes are almost uncontrollable, I have difficulty on rivers where I must compete with them. In recent years, I have shunned both the Wolf and Bois Brule, because of rafters and "tubers." Somehow, my old wooden canoe just doesn't mix. So, I seek out lesser-used, smaller rivers like the upper Flambeau, the Chippewa, and the St. Croix. There's less competition and I can still breathe in the feel of wilderness, the sights of wildlife and the exhilaration of swift, running water.

Once, a bald eagle swooped over me and my sons as we ate our lunch on an island in Lake Escanaba. Shortly after, we watched a whole eagle family soar and glide around the entire lake. We couldn't take our eyes off them. On the Flambeau, close-ups of bald eagles and ospreys, perched in trees above the river are a recurring thrill. Several times I've watched in silent awe the classic confrontation between osprey and eagle — osprey catches fish, eagle plummets screeching from above, startled osprey releases fish, eagle flies away with its stolen catch.

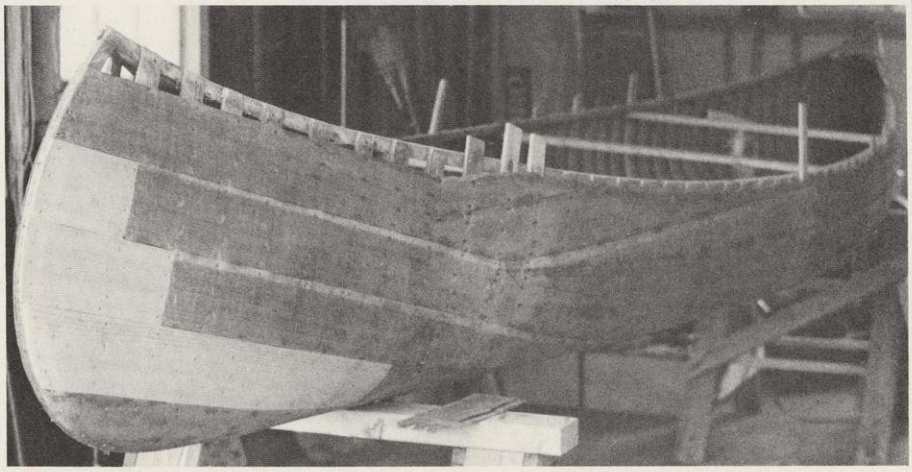
Once from a canoe on a quiet northern lake I watched a pair of bald eagles tend their young and I've seen another fly close along the water, swinging its talons like a pendulum, seeking breakfast through the morning mist. I've quietly "stalked" a red fox on the shore, as it stalked a great blue heron — which knew all the time, and

I LIKE WOOD

Why a wooden canoe? My friends admire the grace and beauty, but lament the "endless hours" I spend maintaining the canvas sheath and repairing the cracked ribs or split planking. Wood and canvas require more maintenance than aluminum or plastics but it's worth it, and it needn't be tedious. On a trip you temporarily repair any tears in the canvas shell with duct tape . . . and later do a permanent job with small pieces of canvas, patching compound and paint. And the wooden gunwales — those sturdy strips along the upper edges of the hull — usually require sanding and a new coat of varnish to remove each year's scratches and scrapes.

After a few years the hull needs a new paint job. It requires thorough sanding to remove most of the old layer, lest it build up and cause "checkerboard" cracking. Recaning the seats is an infrequent task, and not an unpleasant one, providing several evenings' quiet relaxation at the basement workbench during winter. In fact, owning and caring for such a beautiful craft can in all ways be a delightful, enjoyable task.

I find such great pleasure in tending my 17-year veteran Old Town, that I recently acquired and rebuilt two more. Two years ago, I picked up an 18-foot Old Town guide model and



It took me a year to refurbish my 18-foot wood and canvas guide canoe. Photo by author

spent a year replacing broken ribs, gunwales and planking, and stretching, filling and painting new canvas. Now, not only has this canoe floated the placid lakes of Northern Highlands, but it has traveled the isolated lakes, rivers and rapids of rugged central Ontario. It's truly a wonder the way this beautiful craft glides along so easily, even loaded with camping gear and supplies for a two-week trip!

If you can't afford a wood canoe or find one to repair — or if you lack the desire to undertake such a task and aren't interested in the thousand-dollars-plus a new wood canoe may represent — there are other alternatives. Technology of the 70's brought two other canoe materials into use that both offer definite advantages. Canoes made from a laminated plastic called "ABS" are slightly more expensive than aluminum, but virtually indestructible. Their lines are every bit as appealing as aluminum canoes — in many cases more so — and several manufacturers provide extra finishing touches via wood gunwales and seats. A second, fiberglass-like material called Kevlar provides great strength and allows sophisticated hull designs — but its high cost may limit its appeal.

flew when the fox approached too near. Silent and swift, canoes are matchless for observing wildlife.

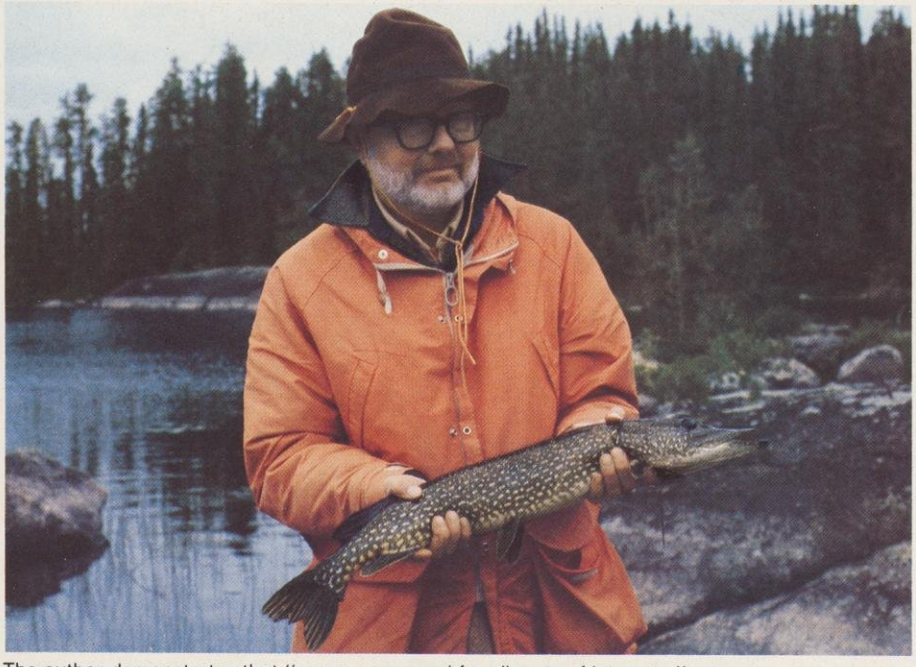
And they help you develop other interests. I now carry binoculars and a bird guide. A sketch pad helps pass time after the sun climbs and fishing goes slack. I once tried to paint in the canoe but it was a disaster. Juggling all the paraphernalia left little time to enjoy the trip. Now I make a quick sketch or take a photograph. Later, in front of a warm fire on a cold winter's evening, I can transform the scenes and events of summer onto paper with pigment. It's a chance to relive the strokes of the paddle, the glory of sunset or the brilliance of fall and the subtle change in foliage.

Wisconsin's wilderness, its lakes, rivers and forests, have enabled me to enjoy and appreciate the great authors of the outdoors. None has given me greater pleasure than Sigurd Olson, the native of Ely, Minnesota who wrote "Singing Wilderness" and has an institute named after him at Northland College. In a way that few could, Olson has magnificently captured the "feel" of canoe country. He can do this because he has devoted his life to preserving the wilderness values canoes evoke. I feel I share his "reflections" and am indebted to him for keeping alive in me a fire for conservation. The canoe has been an important part of it. Once Sigurd Olson wrote a short inscription for me in the fly leaf of one of his books: "As an artist you have the perception to understand what Blake meant when he said:

' "To see the world
in a grain of sand and
Heaven in a wild flower." '

A canoe can do this for you. It has for me.

The chance to see an osprey nesting in a tree above the river is a recurring thrill.
Photo by Dale Lang



The author demonstrates that "canoes are good for all sorts of interests."

SAFETY

In any endeavor there are hazards along the way and canoeing is no exception. The wise and proper use of a life jacket is a must. Not only is it the law but it could eliminate tragedy. Being able to recognize hypothermia, that stalker of all outdoor activity, is a good idea, too, — particularly when days are cool and wet. Knowing the symptoms can keep you aware of any changes in your own body and help you watchdog your friends.

Here's a safety checklist from the American Canoe Association:

1. **Be a competent swimmer.**
2. **Wear a lifejacket.**
3. **Keep your craft under control.**
4. **Be aware of river hazards and avoid them.**
5. **Don't boat alone.**
6. **Have a frank knowledge of your boating ability. Don't attempt waters beyond it.**
7. **Be in good physical condition.**
8. **Be practiced in escape from an overturned craft.**
9. **Know first aid.**
10. **Master the eskimo roll if you plan to run large rivers or those with continuous rapids.**
11. **Wear a crash helmet where an upset is likely.**
12. **Be suitably equipped.**

DNR'S BOATING SAFETY PROGRAM

Teaches safe operation and handling of all types of boats. Course includes at least eight lessons of instruction and covers such things as types of boats, trailering, life saving equipment, safety in water, aids to navigation, Wisconsin boating laws and related information. It is open to persons age 10 and older at a fee of $2. Courses are taught locally by volunteer instructors. For more information contact the DNR office in your area or write Boating Safety, Department of Natural Resources, Box 7201, Madison, WI 53707.

Continued next page...

CANOE ORGANIZATIONS

These groups welcome newcomers, sponsor trips and give instruction:

American Youth Hostels
Wisconsin Council
7218 W. North Avenue
Milwaukee, WI 53213
Phone: 414-257-2323

Madison Canoe and Kayak Club
c/o Kathy Walsh, president
665 Knickerbocker St.
Madison, WI 53711
Phone: 608-238-6156

Rock River Canoe Club
P.O. Box 263
Janesville, WI 53545
Pam Truog, president
Fort Atkinson, WI
Phone: 414-563-5092

Wisconsin Hoofer Clubs
Memorial Union
University of Wisconsin-Madison
800 Langdon Street
Madison, WI 53706
Phone: 608-262-0156

Sierra Club
John Muir Chapter
c/o Larry Ziebell, river touring chairman
6561 Hill Ridge Dr.
Greendale, WI 53219
Phone: 414-425-2959

SAFETY INSTRUCTION:

American Red Cross
Dane County Chapter
Department of Safety Services
1202 Ann Street
Madison, WI 53713
Phone: 608-255-0021
(Some other locations also participate. Contact your local chapter.)

CANOE RACING:

United States Canoe Association
c/o Mike Reynolds
617 S. 94th St.
Milwaukee, WI 53214
Phone: 414-354-7794

A "leisurely" trip down the Flambeau winds up with some increasingly tricky whitewater at Beaver Dam Rapids.

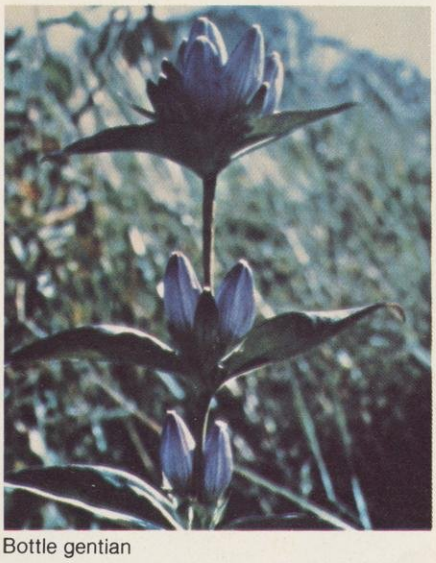
The prairie garden

Butterfly weed

You can grow Wisconsin's native plants. This introduces a primer that tells you how.

J. ROBERT SMITH
BEATRICE SMITH

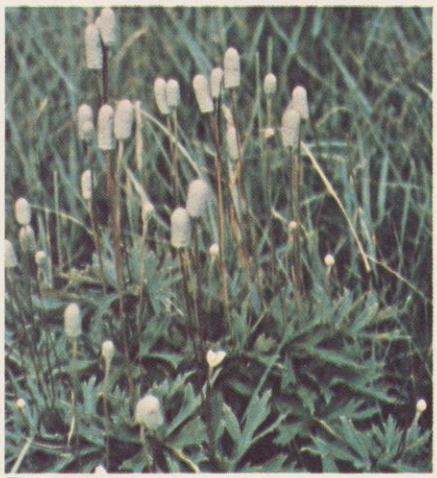
Bob Smith is the retired Administrator of DNR's Division of Resource Management. His wife, Bea, is a well known Wisconsin author.



Bottle gentian

This article is excerpted from the recently published book *The Prairie Garden: 70 Native Plants You Can Grow in Town or Country* by Robert Smith with Beatrice Smith; University of Wisconsin Press; Cloth $22.50, soft cover $9.95.

My interest in prairies goes back to the 1930s when as a boy I hunted sharptail grouse on the Douglas County barrens of northern Wisconsin. Barrens are similar to prairies in many ways and contain many of the same plants, often dwarfed by desertlike conditions in summer. In fall, vast open spaces of grass speckled with asters and goldenrod reach to the horizon, broken only by scattered clumps of oak, jack pine, and aspen. I remember the great sense of freedom the space gave me, just me, with my setter by my side, my single-barreled 16-gauge shotgun over my shoulder, and an apple in my pocket. The next time I hunted there the area had changed considerably. So had I. The barrens had been planted to jack pine. I nearly wore myself out walking across the furrows. The last time I was there rows of pine trees stood 20 feet tall. The barrens were gone. I still feel the loss.



Thimbleweed

Birdsfoot violet

My interest in prairies was further stimulated when as a Department of Natural Resources employee I was involved administratively in the state-wide acquisition and management of fish and game areas. Some of the first prescribed burning on a large scale was in the Crex Meadow Conservation Area in Burnett County in northwestern Wisconsin to improve waterfowl and prairie grouse range. Under the direction of Norman Stone, District Game Manager, and Burton Dahlburg, Area Supervisor, a dense forest of 20- to 30-year-old oak and jack pine was burned in the spring of 1957. To everyone's surprise, including that of Professor John T. Curtis of the University of

Photos by Richard Williamson Illustrations by Patricia Mueller

Wisconsin Botany Department, examination of the Area in July 1957 revealed more than 70 species of prairie plants, some in bloom.

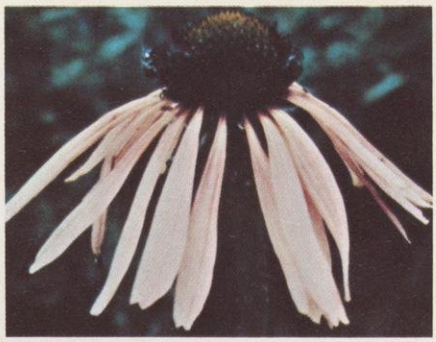
Stone reported that on further study of the Area and of unburned adjacent sites, botanists concluded that the prairie plants were present in dwarfed or semidormant form and responded immediately to sunlight when fire

Pasque flower

removed the shade. It was an exciting time for botanists and for the rest of us.

My relationship with prairies intensified in 1959, the year my family bought a 154-acre farm in Marquette County in central Wisconsin. At that time the property was in a state of disrepair. The house was a broken-down fishing shanty. The soil had not been tilled for many years. Cattle meandered at will through the neglected pastures and in and out of the jack pine and oak, drinking water from the trout stream, and ruining the bank cover. The spring-fed pond was used as a dump. Wind swept across the sand. The terrain, molded by ancient, earth-grinding glaciers, was flat; there were no pretty ridges, no green valleys. But not far from the house was a long-abandoned family garden on a gentle north slope. A few thousand years ago it probably had been a shallow sedge marsh. It contained a plentiful amount of organic matter, augmented over the years by frequent applications of manure. Southward, the organic matter gradually diminished to dry sand. Thus, at least in sand country terms, I had at my fingertips moist, mesic, and dry

Milk-vetch



Pale purple coneflower
Prairie blazingstar

prairie soil. In addition, scattered throughout the acreage were many native plants that included a variety of prairie species.

Orange-red butterfly weed was the first prairie plant to catch my eye that year of 1959. I noticed it during the long walks I took with my wife Bea and our two then-young sons. One sturdy butterfly weed plant was growing in the corner of a neglected field made up mostly of cool-season grasses. The brilliance of that butterfly weed could be seen a quarter-mile away. I was impressed, but there were other jobs demanding attention. The house had to be made habitable. A hundred years of junk had to be removed from the pond. A moving sandblow had to be tied down. Fences had to be built. A vegetable garden had to be prepared. Not until 1966 was I able to return to my butterfly weed.

In 1966, I also happened upon Kenfield's *The Wild Gardener in the Wild Landscape*. Kenfield took long walks as I did, and to make them more interesting established wild and domestic flowering plants at intervals throughout his property. I questioned his methods; still, it was an intriguing idea. Why couldn't I have clumps of butterfly weed growing where I wanted them?

In September and October of 1966 I collected seed from my butterfly weed just as the pods were beginning to burst. I put the seed into a pail and stored it in the barn loft, a safe, dry place. The following spring I sowed the seed. In 10 days it was up. By fall, there were carrotlike roots 4-to-5-inches long, ideal for transplanting wherever I chose. The procedure seemed simple.

Lupine was the next prairie plant to capture my attention. The lupine plants

Queen-of-the-prairie

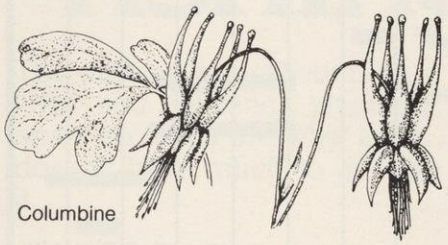
on the farm property were blue-blossomed, beautiful, hardy, and plentiful. But most of them were along the roadside where they were mowed down by the county weed-cutter. They deserved better. There was another stand in an area overrun by jack pine and oak. The plants were only 4-to-10 inches high with no bloom. I longed to bring them sunlight, but burning was out of the question. Why couldn't I transplant the doomed and the dwarfed?

I tried. To my amazement, transplanting wild lupine was impossible. The long white brittle root was too big to move successfully. Seed seemed to

New England aster

be the answer. Scrounging on my hands and knees, I found a few seeds scattered on the ground. I planted them, watered them, protected them; but no seeds germinated. Why not?

The seed had to be fresh, I decided. The next summer I watched an old stand of lupine carefully, saw the pods turn yellow, then black. Finally on a hot



Columbine

July morning the dried pods began twisting and bursting, throwing seeds up to 15 feet. Quickly, I scrambled on all fours and picked up the fresh seed that had fallen, then took it back and sowed it on a site I had prepared.

The seeds sprouted nicely, including a few I accidentally dropped on top of the soil. But it was July, a very dry July, and disaster struck. All my young lupine seedlings shriveled and died. Obviously, lupine seed must be sown in April or May in Wisconsin to take advantage of the cool, rainy season. My loss of seedlings was a hard lesson, but it set me thinking.

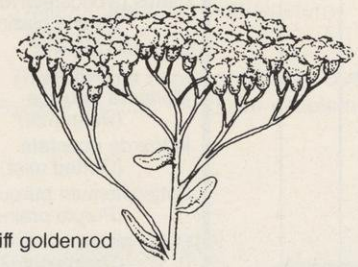
Fresh, still-soft lupine seeds taken directly from the pod germinated immediately. In fact, with exceptionally favorable moisture conditions they germinate on top of the soil. Those first lupine seeds I'd tried had already developed a tough seedcoat impervious to water. That's why they had not germinated. But there was hope for them. Lupine, I knew, belongs to the

Prairie rose

legume family. I was enough of a farmer to know that all domestic legumes require scarification, a scratching of the seedcoat to admit moisture. This was something I could try with the lupine seeds the following spring. But it was fall. What could I do?

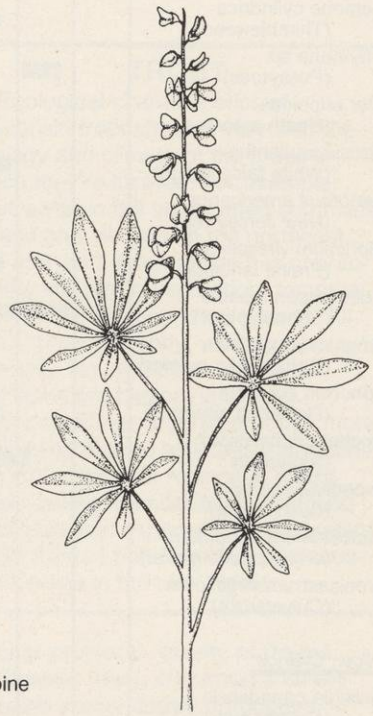
Looking over the old lupine stand again, I found a few hard, dried seeds lying about just as I had before. And as before, their coats were too hard to permit moisture to enter. Germination would take place naturally the next spring after the seeds had softened and dampened. Could I imitate nature?

I took the dried, hard lupine seeds, sowed half of them 3/4 inch deep in the vegetable garden near the house. In early March of the following year, I scarified the remainder of the seed, dampened it, and put it in the refrigerator.



Stiff goldenrod

Unfortunately, that was a busy spring. Four weeks passed. By the time I returned to the farm, the lupine seed in the refrigerator had sprouted and become moldy, and was no longer fit to plant. The seed in the garden was up and doing well, but it was too big to transplant. All in all, there was little to show for 2 years of effort. But at least I



Lupine

knew that dry lupine seed, scarified, dampened, and stored in a refrigerator, would germinate. And so would fall-planted lupine seed.

The next year I tried again, and was rewarded with a fine stand. It wasn't easy to establish. I always had drought to fight. But once established, my

Typical prairie plant detail from *The Prairie Garden*.

BUTTERFLY WEED
Asclepias tuberosa

COMMON NAMES: Butterfly Weed; Pleurisy Root; Canada Root; Indian Posy; Orange Root; Orange Milkweed; Tuber Root; Orange Swallowwort

KIND OF PRAIRIE: Dry; Mesic

HEIGHT: 1 to 2 feet

COLOR OF FLOWER: Brilliant orange-red, sometimes yellow, sometimes white

FLOWERING TIME: Mid-June to mid-August; from seed, the second year; from transplants, the first year; flowers increase in number and size as plants grow older.

SEED COLLECTION DATE: September to October

PROPAGATION: Best propagated from seed. To produce transplants, sow seed 1/2 inch deep in spring (early June in Wisconsin) . There is some tendency for year-old plants to frost-heave in spring, thus exposing buds and resulting in injury; this can be controlled by use of light mulch. Transplants can also be produced from 2-inch root cuttings, treated with Rootone, planted 2 inches deep. Permanent plantings can easily be established from seed or from transplants in fall or spring.

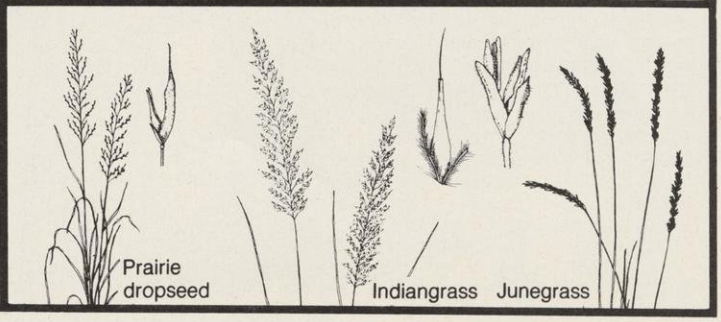
COMPANION PLANTS: Leadplant; Little Bluestem; Junegrass; Silky Aster; Showy Goldenrod

COMMENT: This is one of the most strikingly colored prairie plants, with a rare ability for attracting butterflies. Monarchs like to lay their eggs on butterfly weed, which contains a substance poisonous to birds. They will not eat the larvae. Butterfly weed is a handsome cut flower that lasts well, especially if plunged into cold water immediately after cutting. Widespread and long-lived, it is found in grasslands from New England to Arizona. Its branching taproot, an inch in diameter, is subject to a fungus that destroys the root tip and other portions of the plant. However, the damaged parts regenerate and grow as well as any, although they look rather grotesque. Boiled roots, regardless of shape, were once used to treat pleurisy and other lung troubles.

PRAIRIE PLANTS BY COLOR AND FLOWERING TIME

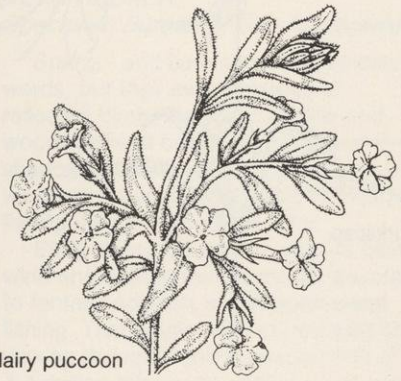
Species	April	May	June	July	Aug.	Sept.	Oct.
White, Off-White							
Allium cernuum (Nodding pink onion)							
Anemone cylindrica (Thimbleweed)							
Antennaria sp. (Pussytoes)							
Aster ericoides (Heath aster)							
Baptisia leucantha (White false indigo)							
Ceanothus americanus (New Jersey tea)							
Delphinium virescens (Prairie larkspur)							
Dodecatheon meadia (Shooting star)							
Eryngium yuccifolium (Rattlesnake master)							
Euphorbia corollata (Flowering spurge)							
Heuchera richardsonii (Alumroot)							
Lespedeza capitata (Bush clover)							
Petalostemum candidum (White prairie clover)							
Veronicastrum virginicum (Culversroot)							
Yellow, Orange							
Aquilegia canadensis (Columbine)							
Asclepias tuberosa (Butterfly weed)							
Astragalus canadensis (Milk-vetch)							
Baptisia leucophaea (Cream false indigo)							
Coreopsis palmata (Stiff coreopsis)							
Helianthus occidentalis (Western sunflower)							
Hudsonia tomentosa (False heather)							
Lilium superbum (Turk's cap)							
Lithospermum croceum (Hairy puccoon)							
Oenothera biennis (Evening primrose)							
Ranunculus rhomboideus (Prairie buttercup)							
Ratibida pinnata (Yellow coneflower)							
Rudbeckia hirta (Black-eyed susan)							
Silphium laciniatum (Compass plant)							
Silphium perfoliatum (Cup plant)							
Silphium terebinthinaceum (Prairiedock)							
Solidago nemoralis (Gray goldenrod)							
Solidago rigida (Stiff goldenrod)							
Solidago speciosa (Showy goldenrod)							

Species	April	May	June	July	Aug.	Sept.	Oct.
Blue, Purple, Rose, Red							
Amorpha canescens (Leadplant)							
Anemone patens (Pasque flower)							
Asclepias amplexicaulis (Blunt-leaved milkweed)							
Asclepias incarnata (Red milkweed)							
Aster novae-angliae (New England aster)							
Aster sericeus (Silky aster)							
Callirhoe triangulata (Poppy mallow)							
Echinacea pallida (Pale purple coneflower)							
Echinacea purpurea (Purple coneflower)							
Filipendula rubra (Queen-of-the-prairie)							
Gentiana andrewsii (Bottle gentian)							
Geum triflorum (Prairie smoke)							
Iris shrevei (Wild iris)							
Liatris aspera (Rough blazingstar)							
Liatris cylindracea (Dwarf blazingstar)							
Liatris pycnostachya (Prairie blazingstar)							
Lupinus perennis (Lupine)							
Monarda fistulosa (Bergamot)							
Monarda punctata (Dotted mint)							
Petalostemum purpureum (Purple prairie clover)							
Phlox pilosa (Prairie phlox)							
Psoralea esculenta (Prairie turnip)							
Rosa sp. (Prairie rose)							
Sisyrinchium campestre (Blue-eyed grass)							
Tephrosia virginiana (Goatsrue)							
Tradescantia ohiensis (Spiderwort)							
Vernonia fasciculata (Ironweed)							
Viola pedata (Birdsfoot violet)							



lupine plants increased in density and number and eventually their blue blossoms were as delightful to behold as I had imagined they would be.

With the lupine case solved, I took on spiderwort. Not being a member of the legume family, it could not be treated like one. I first sowed dry spiderwort seed in the spring of 1969, hoping it might be this easy. It wasn't, nothing came up.



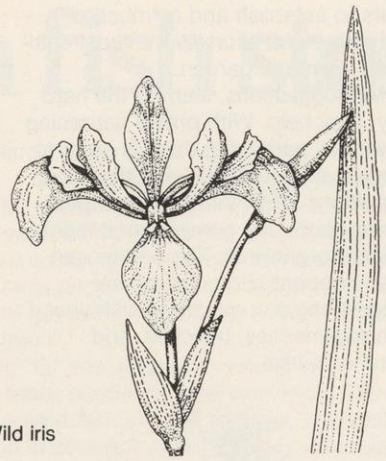
Hairy puccoon

The next April I planted early potatoes in the same general area. In June, while hoeing the potatoes, I noticed a thin wavy line of seedlings. Spiderwort seedlings? I knew the seeds of some conifers were subjected to damp cold to break their dormancy. Had overwintering in the soil "turned on" the spiderwort seed? And what about that first butterfly weed seed, my first success? By storing it in the cold dry barn loft, had I accidentally subjected it to the treatment it required to germinate?

At that point I did what I should have done in the beginning. I went to the University of Wisconsin Arboretum and talked with Jim Zimmerman and

White prairie clover

other natural scientists. Additional information came from further reading and conversations. The more I learned, the more enthusiastic I became, and the more I experimented.



Wild iris

One of the great thrills was the day I discovered how to induce New Jersey tea to germinate. So far as I knew, no one had been entirely successful. One evening while paging through Clyde Robin's catalog I happened on this statement regarding a western species of *Ceanothus:* "To germinate *Ceanothus,* pour boiling water over seeds and allow to cool." *Ceanothus* was the same genus as New Jersey tea. Would it work? It would, and the water didn't have to be boiling, I discovered. Water at 135°F worked fine for me and still does.

Throughout the years what has impressed me most about prairie plants, in addition to their beauty and

Shooting star

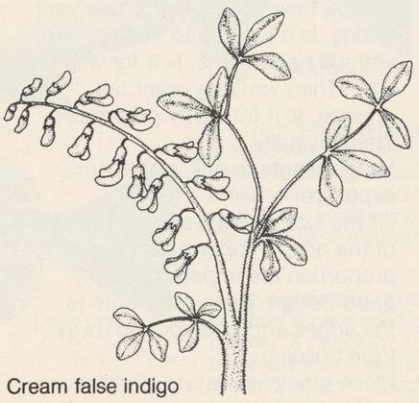
complexity, is their persistence. I have seen showy goldenrod sow itself in the mowed section of our lawn, and survive season after season of clipping. I have seen black-eyed susan bloom in the graveled ramp that leads to our barn loft, and manage to keep its head up despite being run over by tractor wheels some 50 to 100 times. The first butterfly weed plant I spotted in 1959 has been blooming every year, except one. For some reasons it disappeared in 1969, but returned in 1970, flourished in the following years, and now looks as if it might live forever.

Then there's incredible leadplant. In April 1974 I pruned a bundle of 2-year-old leadplant, leaving roots 6 to 8 inches long, and placed the roots in a heeling bed. Most of the plants were sold that spring, but a few remained with their tips 5 or 6 inches underground. The area was cultivated regularly that summer and the following spring. Prairie smoke was transplanted into the area, and the area irrigated. Up came the leadplant. In fact, the leadplant appeared each year thereafter despite cultivation. In July 1979 I dug up what I thought to be a group of four or five plants. It turned out to be one plant with six 6-inch green shoots with leaves. The old pruning cuts were still visible where the root tip had been cut off. From this cut came a 10-inch broken root at a right angle from the stem. There were four other short lateral roots. And from the old bud came a new 5-inch leader to the soil surface.

Prairie plants have many ways of fighting destruction. They resist fire and drought the same way they resist the

Cupplant

shovel, by an extensive root system. They resist winter weather through hardening. They resist water loss through specialization of their aboveground parts. They resist competition by cooperating with companion plants and closing out intruders. They take advantage of wind, birds, and insects. They must have long hours of sunshine to survive, but, relatively speaking, little else. Once established, prairie plants



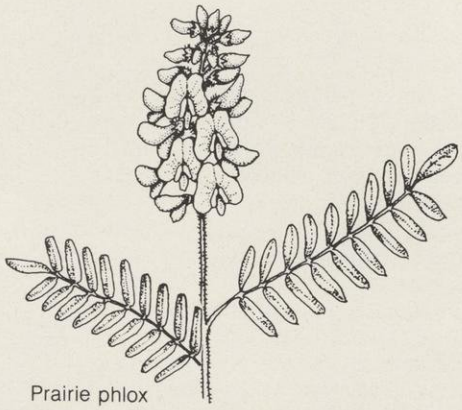
Cream false indigo

Goatsrue

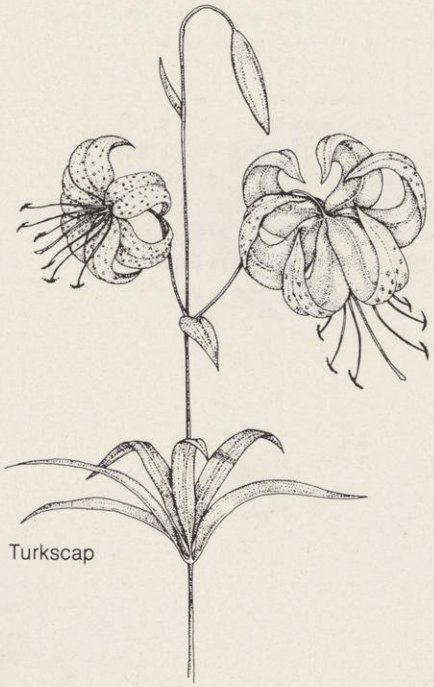
require no covering, no pruning, no spraying, and most important, no irrigating, thus saving prairie gardeners hundreds of dollars in maintenance costs. In fact, with ever-decreasing energy sources, the only ornamental plant of the future may well be the hardy native that requires no artificial watering.

However, simply sitting back and letting nature take its course is not the same as establishing a sod of prairie grasses and forbs. A prairie landscape will take a minimum of three or four years to establish and as much or more time and effort as the most cultivated lawn and garden.

My suggestions, learned the hard way, may help. With prairie gardening as with all gardening there is more to success than just following the rules. Conditions differ. Weather changes. Prairie plants are complex and highly variable organisms. The unforeseen often happens. So consider my suggestions and mix them with your own experiences, hunches, and common sense.



Prairie phlox



Turkscap

PLANNING AND PREPARATION

After deciding that you are willing to work at establishing a prairie area, take a walk around your property and see if there is a spot suited to growing prairie plants. The site must have from 70 to 100 percent sunlight.

Before planting anything, you should have an overall plan. Even if you toss it aside later, a plan will serve as a guide.

Get a sheet of graph paper and mark the boundaries of the site, scaling it as accurately as possible. Mark the location of existing buildings, walks, driveways; and indicate soil types, exposure, slopes. Now you have a bird's-eye-view of the problems to be solved. At this point you may throw up your hands and decide to call a landscape architect or your local nursery. However, if you decide to go ahead on your own, here are some suggestions:

1. Decide how you intend to use your prairie. Is it a place to stroll? Then you will need paths. Is it for wildlife? Then you may want tall grasses. Is it for many purposes? Then diversify.
2. Match plants to soil, slope, and exposure.
3. Fit the size of the plants to the size of the area. Proper balance and proportion are important in any good design. Keep tall plants to the edges and back of and away from buildings.
4. Place plants as nature might; no regular rows, no sharp corners, and no little square patches here and there. Free-flowing curves, turns, twists, and swoops; that's nature's way.
5. Try for continuous color throughout the growing season.
6. Allow one species to dominate, then blend to another. A species should be thick enough to be felt, even though it might mean planting fewer varieties. Give the more aggressive species competition.
7. Remember that a prairie is a grassland, with perhaps 50 to 85 percent of the area taken up by grasses.
8. Introduce species into natural habitats. Keep exceptions to a minimum.
9. Make use of existing features, such as house, shed, rocks, fences, walls, ponds, slopes, and swales.
10. On large areas, leave space for a firebreak.
11. Whatever the size of your site, when you begin a prairie landscape it is wise to "think small." This is especially true if you lack time, energy, experience, help, and/or proper equipment. Starting on a modest scale gives you time to learn about the plants and how they adapt to your site. It also leaves room to expand, using your own seed and transplants.

New England aster

Catch-all

The special supplement that starts after *Catch-all* was prepared by the Department of Development's Division of Tourism in cooperation with *Wisconsin Natural Resources*.

Called a tourism "lure book" in the public relations trade, it will be distributed nationally as well as in Wisconsin. Here, magazine readers get first look at the valuable information it contains.

Feds cut $35.5 million

$142 million more looms

Madison—Effective this fiscal year, the Reagan administration has cut water pollution control and Land and Water Conservation Fund grants to Wisconsin by $35.5-million. Still undecided are proposals for the next biennium which need Congressional approval. These would chop an additional $142¼-million from a variety of programs administered by DNR. If the cuts get Congressional approval, serious effects are not expected in Wisconsin until late in 1982.

Of the $35.5 million already eliminated, $32-million was slated to help build municipal sewage treatment plants in various Wisconsin communities. The remaining $3.5-million is Land and Water Conservation Fund (LAWCON) money, about half of which was for local park aids. DNR recreational land purchase and development would have received the rest.

Cuts proposed for the 1981-83 biennium would reduce federal aids for construction of municipal sewage treatment plants in Wisconsin by $130-million. No aids dollars are recommended for '82 at this time under the Reagan budget. Thereafter they may amount to $40-million annually.

While such reduced funding could affect pollution plant construction schedules, DNR is exploring alternative methods of financing. **Alternatives include substitution of state for federal dollars and increased local contributions.**

Other local aid reductions in the proposed federal budget for next biennium amount to $6.8-million. They would eliminate local LAWCON payments of $3.3-million, and reduce funds for water quality planning by $849,000, rural fire protection by $150,000 and inland lake cleanup by $2.3-million.

The impact of the LAWCON cuts on local government would be lessened if proposed ORAP 2000 legislation passes. ORAP 2000 local aids are included in DNR's version of the state budget, but excluded from the Governor's.

The remaining $15.3-million in proposed federal reductions would include state land purchased under LAWCON, planning, sport and commercial fishing, endangered species, youth camps and other items.

Can't catch me

Dave Weltz
Public Information, La Crosse

La Crosse—The mild winter of 1980-81 was good for Wisconsin's new turkey population but tough on DNR wildlife managers trying to trap them. Ron Nicklaus of the Mississippi River Work Unit says abundant and readily available wild food like seeds and acorns caused turkeys to turn up their noses at grain in baited traps. The birds are trapped for transplant to other areas.

Nicklaus says he watched three and four flocks walk right past baited trap stations which in a normal winter would be sure fire. **This year 10 birds were trapped near Romance in Vernon County and transferred to an area near Ontario. A scheduled release in Buffalo County was not possible.**

Populations in the southwest now include birds in Vernon, Crawford, Iowa, Buffalo, Richland and Grant counties.

One adult gobbler was killed by a car in January. It weighed more than 20 pounds and was in prime condition, Nicklaus says.

Warm temperatures have advanced the breeding season slightly and, barring bad weather, this should be a further bonus. Polts will have a longer growing season before facing stresses of the 1981-82 winter and be better able to handle its rigors.

"I'm just real certain we're going to have a lot of surplus gobblers," says Nicklaus.

Lake vigilantes

Madison—The Friends of the Eau Claire Lakes in southern Bayfield County were concerned. They'd been paying attention to the national uproar about acid rain. They knew that burning fossil fuels creates sulfur and nitrogen oxides that mix with precipitation to form dilute acids — acid rain. They knew acid rain could pose a severe threat to the lakes they knew and loved. They knew that although the country is burning more and more fossil fuels, government funds for acid rain research are depleted — and unlikely to be replenished soon. What they didn't know was whether acid rain damage was already occurring in their lakes or how serious it might be.

So the Friends of the Eau Claire Lakes decided to take matters into their own hands. They bought some equipment, borrowed more, even manufactured their own. They relied on the technological know-how of some members — and willing dedication of others — to collect samples and make measurements. In all, they checked 14 Bayfield County lakes for pH, total alkalinity, electrical conductivity, chloride ion concentration and water clarity.

The group first checked pH levels — the amount of acid now in the water. They found that the lakes basically were in good shape, ranging from 6.7 to 8.0 on the 14-point pH scale. Anything above seven is alkaline, below seven is acid. Damage to fish occurs below six.

But when the group measured alkalinity, they found cause for concern. The level of alkalinity (or buffering capacity) measures a lake's ability to neutralize incoming acid rain, the way alkaline baking soda neutralizes the acid in vinegar.

The test for alkalinity showed one third of the lakes "potentially susceptible" to effects because of limited ability to neutralize acid.

They measured chloride ion concentration — to check for road salt or sewage contamination — and also tested overall water transparency.

With their bought, begged and borrowed equipment, the group conducted several thousand dollar's worth of sophisticated scientific testing for less than $100. They plan to continue their experimentation two or three times each month, May through September, 1981.

$67-million for pollution cleanup

Diane Brinson
Public Information-Madison

Madison—The Wisconsin fund, administered by DNR has started releasing $67-million to 59 communities for various water pollution control projects.

The money is paid out piecemeal after work is completed on different phases of construction. Amount is based on bids received by local communities and represents 60% of eligible costs. **Total cost of the 59 projects is in excess of $120-million with the additional money coming from the community and federal aid.**

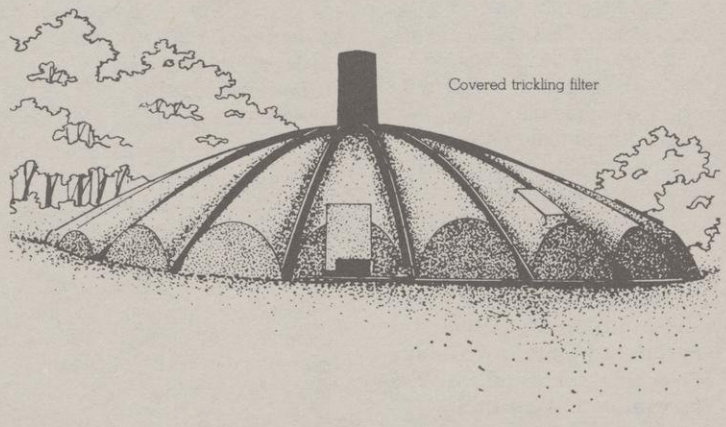
The Wisconsin fund runs through 1987 and is slated to pay out $800-million by that time for eligible pollution control projects.

Here is a list of the latest grants:

Ashland — $70,254
Baraboo — $1,855,095
Belmont (Lafayette) — $352,322
Beloit — $1,311,099
Benton (Lafayette) — $495,160
Brooklyn (Dane) — $433,924
Caddy Vista (Racine) — $170,844
Cambridge (Dane) — $717,133
Clinton (Rock) — $514,268
Cloverleaf Lakes Sanitary District (Waupaca) — $695,197
Cochrane (Buffalo) — $221,953
Columbus (Columbia) — $387,545
Cottage Grove (Dane) — $728,357
Cross Plains (Dane) — $349,696
Cuba City (Grant & Lafayette) — $710,467
Cumberland (Barron) — $1,510,102
Dousman (Waukesha) — $1,284,849
Durand (Pepin) — $1,224,508
Eden (Fond du Lac) — $461,309
Edgerton (Rock) — $1,820,160
Eleva (Trempealeau) — $343,274
Elroy (Juneau) — $174,070
Embarrass (Waupaca) — $914,071
Footville (Rock) — $224,779
Forestville (Door) — $435,135
Fredonia (Ozaukee) — $134,233
Gillett (Oconto) — $771,021
Greenwood (Clark) — $749,260
Gresham (Shawano) — $345,827
Hortonville (Outagamie) — $2,455,655
Hubbard-Hustisford (Dodge) — $147,519
Hustisford (Dodge) — $224,981
Hustler (Juneau) — $141,576
Independence (Trempealeau) — $393,378
Kenosha — $1,206,578
Kingston (Green Lake) — $435,113
Lake Mills (Jefferson) — $961,200
Lodi (Columbia) — $58,486
Markesan (Green Lake) — $234,589
Middle River Health Care Facility (Douglas) — $209,224
Milwaukee — $26,561,749 (5 projects)
Mondovi (Buffalo) — $340,905
Oakland (Jefferson) — $1,620,837
Oconto Falls (Oconto) — $657,284
Oconto (Oconto) — $1,146,192
Palmyra (Jefferson) — $802,677
Parkland Health Care Facility (Douglas) — $154,101
Princeton (Green Lake) — $1,021,635
Randolph (Columbia & Dodge) — $1,002,463
Rib Lake (Taylor) — $134,740
Sauk-Prairie (Sauk) — $770,205
Seymour (Outagamie) — $2,278,205
St. Nazianz (Manitowoc) — $645,874
Sturgeon Bay (Door) — $909,314
Taylor (Jackson) — $255,724
Viola (Richland & Vernon) — $287,739
Wilton (Monroe) — $347,510
Wisconsin Dells-Lake Delton — $56,793
Wisconsin Rapids — $783,491 (2 projects)

Take a kid fishing

Washington, D.C.—May 11 to 17 is National Fishing Week. This year's theme is "Take a Kid Fishing." The event will include clinics, seminars, demonstrations and other activities highlighted by a "Waterfront Festival" here that's expected to draw 250,000 visitors.



Covered trickling filter

Endangered $$$ endangered

Madison—The Interior Department has announced a federal cutback in matching funds for endangered species of $1-million this year. **For Wisconsin, the reduction amounts to $32,150, from $123,250 to $91,100. Next year no state funding is provided in the Interior Department budget.**

A proposal is before the Wisconsin legislature to fund programs for endangered and nongame species by a voluntary income tax checkoff that would bring in an estimated $500,000 per year. Checkoffs are already in effect in Colorado, Oregon, Minnesota, Utah, Kansas and Kentucky.

Catchall continued after supplement...

Catch-all

Continued

Free emissions test

Courtesy of the Milwaukee Journal

Barb Fein
Bureau of Air Management

Milwaukee—With the "ozone season" here, DNR is again offering motorists in southeast Wisconsin free auto emission tests. Conducted at shopping centers in a seven county area, the tests measure tailpipe emissions of hydrocarbons and carbon monoxide. Hydrocarbons are a component of ozone.

The voluntary tests are designed to acquaint motorists with the upcoming inspection/maintenance (I/M) program scheduled to begin in 1983. At that time, cars, vans and light-duty trucks in southeastern Wisconsin will be required to pass an annual emissions test before being licensed.

Last year approximately 3,000 vehicles were tested in the voluntary program. Some 38% failed.

Close to one million cars are registered in southeast Wisconsin where the annual I/M program is expected to reduce tailpipe hydrocarbon emissions by 42% and carbon monoxide by 50%

Testing will be on Friday and Saturday starting at 10 a.m. on the following dates:

April 24-25 — Mayfair
May 8-9 — Southgate
May 16 — Southridge
May 30 — Sentry Store, Elkhorn
June 6 — Westbrook, Waukesha
June 13 — Kohl's, West Bend
June 20 — Packard Plaza, Cudahy
June 27 — Menomonee Falls K-Mart
July 10-11 — Capitol Court
July 18 — Richfield Plaza
July 24-25 — Brookfield Square
August 1 — Bay Shore
August 15 — Tri City Natl. Bank, Brown Deer
August 21-22 — Pershing Plaza, Kenosha
August 29 — County Fair Mall, Grafton
Sept. 11-12 — Regency Mall, Racine

Bubble trouble

Jeanne Sollen
Air Management, Southeast District

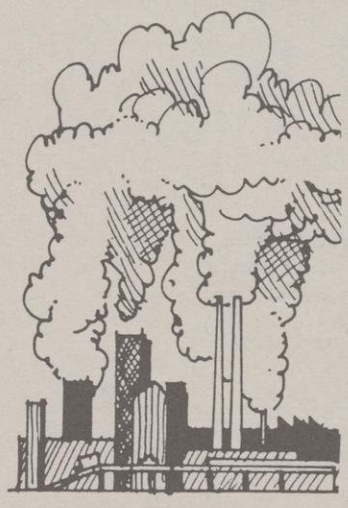
Madison—DNR may take over approval of industry's so called "bubble" air emissions in the state. The change could make it easier for Wisconsin manufacturers to meet clean air requirements. At present, the Environmental Protection Agency (EPA) must give approval.

The federal "bubble" policy allows an industrial plant flexibility in controlling emission sources in the same plant or the same general area.

Instead of controlling the emissions of each stack separately, for example, a plant might find it economically advantageous to consider two smokestacks under the "bubble" concept. One stack might be undercontrolled, the other overcontrolled so long as their total pollution did not exceed the allowable limit.

DNR Air Management Chief Donald Theiler says the problem is to determine equivalency of the various emission sources that are "bubbled." For example, paving a parking lot to reduce dust would not be an adequate offset for higher sulfur discharge. There is also some question about long term total volume reductions under the bubble policy as compared to single stack rules. Theiler says DNR is evaluating effects of the change on Wisconsin air.

The revised federal rule would allow a state rather than EPA to approve use of the "bubble" concept by an industry. Under the present system, EPA approval can take as long as 10 months. It's expected that in about 10% of the cases, those that are most complex, EPA approval would still be needed.



April showers bring dirt

John Nelson
Public Information-Milwaukee

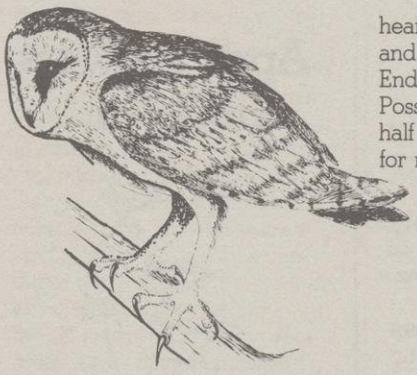
Milwaukee—April showers not only bring May flowers but also dirt, debris and other pollutants that affect Wisconsin water quality through runoff from urban streets and parking lots. Right now, no one really knows exactly what effect this runoff has but a new study here should help provide answers.

The study is part of a $1-million nationwide investigation that will try to determine whether street sweeping and other action can control runoff pollution from cities. Four test and control sites have been established here in commercial, industrial and residential areas. Some spots will be swept at normal intervals while others will get more frequent sweeping. Runoff will be monitored where storm sewers discharge into a river or stream. Street samples will also be taken to determine what type of dry particulates run off. Investigators expect to find high levels of oil, grease, metals, phosphorous and other contaminants.

Related studies are being conducted in 30 other communities across the nation. Results will go to Congress for use in forming a legislative package to control pollution from urban runoff.

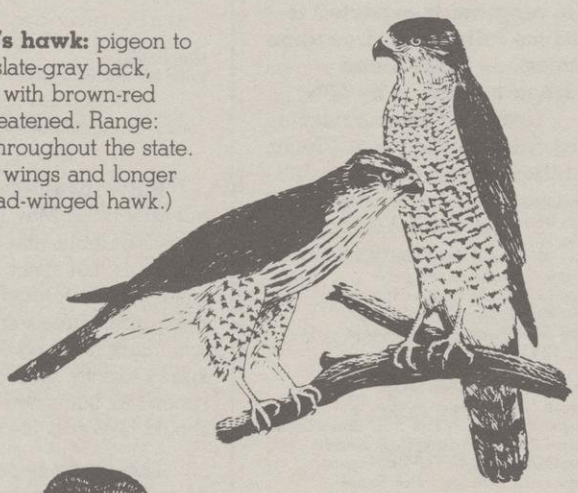
Raptor rollcall

Madison—DNR is looking for observation reports on these three rare Wisconsin birds of prey:



Barn owl: gold back, white heart-shaped face, white breast and long legs, dark eyes. Endangered. Feeds on rodents. Possible range: rural southern half of Wisconsin. DNR pays $25 for reports of an active nest.

Cooper's hawk: pigeon to crow-sized, slate-gray back, whitish front with brown-red barring. Threatened. Range: woodlands throughout the state. (Has shorter wings and longer tail than broad-winged hawk.)



Great gray owl: largest in North America. Two feet tall. Gray-brown back, whitish front with brownish barring, **yellow** eyes. Northern woods. (Common barred owl has dark eyes.)

Report observations to: Office of Endangered and Nongame Species, DNR, Box 7921, Madison, WI 53707. Or phone (608) 267-7507. Be sure to include your name, address and phone number, exact location, date of observation, species and number of birds observed.

Rare bird

Dave Weitz
Public Information, Eau Claire

Menomonie—When John and Lou Russell first sighted a strange bird among the grosbeaks at their feeder on March 16th they didn't realize it would cause topsy-turvy mornings for weeks.

The bird turned out to be a grey crowned rosy finch, and the sighting was the first ever in Wisconsin and only the second east of the Mississippi River. It was verified by Sam Robbins of Medford for the Wisconsin Society of Ornithologists.

Ever since, a stream of birders has stopped at the Russell house eight miles north of here along Lake Tainter. The little grey crowned rosy finch usually shows up at about 7:30 a.m., according to Lou.

She says her list of visitors now totals 18 people from as far away as Elgin, Ill., Shawano and New London, Wis. And the bird, though not always at the feeder, appears often.

Normally the species lives in the Rocky Mountain states and is seldom sighted eastward.

High fire danger

Madison—Because snow cover was only 50% of normal, this spring's fire season in Wisconsin threatens to be the most explosive in years. DNR rangers are bracing for the high danger period which normally runs through May 15 and starts about April 20.

This year DNR started fighting fires at the end of February. **By March 15, there were 241 that had scorched 1,244 acres as compared to only 44 last year which burned 73 acres. Effectiveness of equipment used to plow fire lines was seriously hampered by frost. By April 1, the tally was up to 664 fires and 2,730 acres. Fires were reported every month of the winter.**

According to Duane Dupor, DNR fire control planning analyst, lack of snow has had multiple effects in boosting fire danger. Dried grass, leaves and other vegetation are normally pressed close to the ground, protected from drying wind and kept moist by damp earth. The opposite happens without snow. Coupled with deep frost which prevents whatever moisture there is from soaking in, fires start easier, spread faster and burn longer.

Normally, the fire season starts about March 15 in southern Wisconsin and two weeks later in the north.

Fallen giant

Madison—A downburst accompanied by winds approaching 100 miles per hour recently brought down Wisconsin's largest white ash *(Fraximus americana)* in the village of Maple Bluff near Madison. The tree was nearly 13 feet in circumference and 80 feet tall.

"Trees that old and big are always vulnerable to heavy storms," says R. Bruce Allison, author of Wisconsin's Champion Trees.

Two smaller white ashes now vie for the state title — each 12 feet 1 inch in circumference. One stands on the UW-Madison campus, the other in Grant Park in Milwaukee County.

Libraries show form

Milwaukee—Residents here can now obtain a variety of DNR application forms at their neighborhood public library.

Forms available include state campsite reservations, resident fishing licenses, senior citizen recreation cards, free over-65 fishing licenses, and boat and snowmobile registration forms.

Forms are also available at many suburban libraries as well as the state patrol headquarters in Waukesha.

Readers are invited to send items to Catch-all. Address: DNR Magazine, Box 7921, Madison, WI 53707.

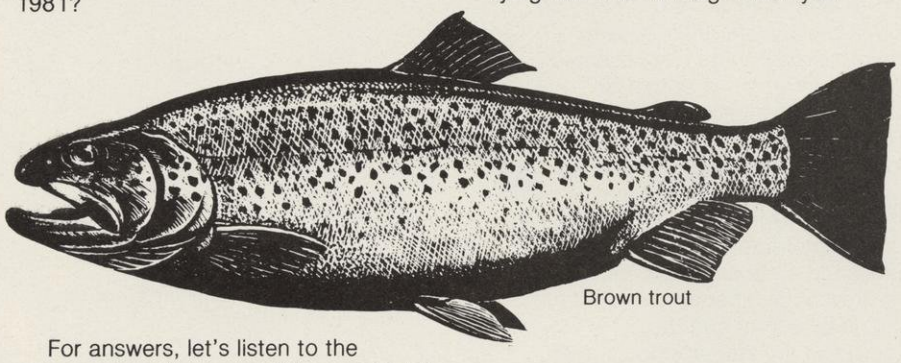
Wisconsin fish story–'81

Bass, musky, walleye, trout, salmon and panfish — *that long!* You'd better believe it! These are the special places.

VERN HACKER
Specialist, Bureau of Fish Management

Spring - and summer! They're only words, but they evoke images of reflected birch, the scent of pine and woodsmoke, a canoe ghosting a shadowed shore, waves crashing on a windswept beach, and last, but most, a fish fighting at the end of a line.

Early spring, of course, with its biting wind and chilling rain, is mostly devoted to fantasy and talk about open-water fishing. That single subject occupies the waking thoughts and conversations of 1.4 million Wisconsin anglers of all ages and categories — at coffee breaks, school lunches, neighborhood taverns, and any other social gathering where more than two fishermen congregate. And all have a question — what are the prospects for this summer — fishing, 1981?



Brown trout

For answers, let's listen to the conversation of some of Wisconsin's fish specialists! What do they predict for the musky fan, the "Hawg" bass hunter, dry-fly trout purist, Great Lakes salmon stalker and panfish popper-tosser?

They're not only talking about common, run-of-the-mill good fishing in Wisconsin's 14,000 lakes, 22,000 miles of streams, and 6.4 million acres of Great Lakes' waters, but also of the unusual — the opportunities and experiences you may have overlooked.

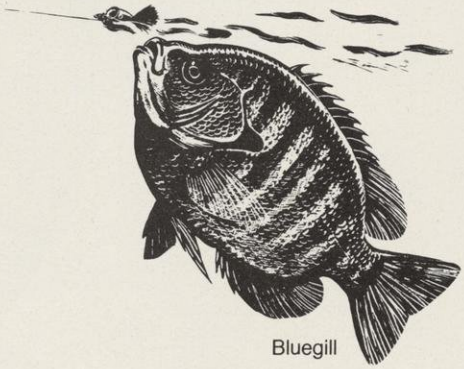
John Klingbiel, warmwater fish specialist, predicts "excellent angling prospects ranging from muskellunge and walleye in northern lakes to catfish in rivers of the south."

"Northern Wisconsin, with its strikingly beautiful outdoors is a major vacationland. It offers literally thousands of lakes where fishermen can try for musky, walleye and panfish. There are deep, cold lakes with rocky shorelines that favor smallmouth and fertile waters for largemouth bass.

Outstanding for bass this year should be Halfmoon Lake in Eau Claire, which was chemically treated several years ago to eradicate rough fish. The restocked bass and other species show every sign of furnishing a standout season. Look into it.

Or how about something *really* unusual? Like catching a 170-pound fish on hook and line. Impossible in Wisconsin! Well, last year a number of lake sturgeon that big were caught by lucky anglers. Some of the waters for the six-week hook and line season are in northwestern Wisconsin: the St. Croix, the Chippewa, Clam and Flambeau Rivers and Yellow Lake on the Yellow River in Burnett County. In the southern part of the state there's Lake Wisconsin on the Wisconsin River.

How do you fish for big sturgeon? With gobs of nightcrawlers or commercial "stink" baits fished on the bottom. Surprisingly, a number of sturgeon fishermen return the fish after catching it so someone else can experience the thrill of tying into one that big. When you consider that a 170 pounder requires 55 to 60 years to reach that size, "tossing it back" is a good idea and helps the sport.

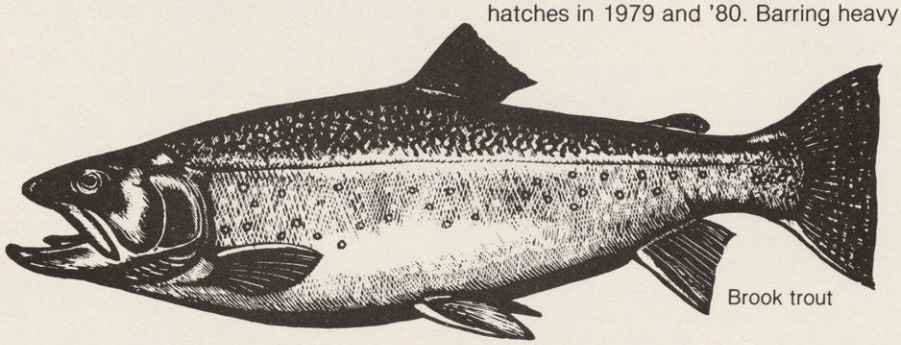


Bluegill

Green Bay and the rocky shores of Lake Michigan are best known for cold-water salmon and trout, but don't overlook the oncoming warm-water fishery for walleye and perch. The two species are growing rapidly and on the increase. Don't be surprised when you hear of excellent catches of *big* fish being taken in the vicinity of Sturgeon Bay in late spring and early summer.

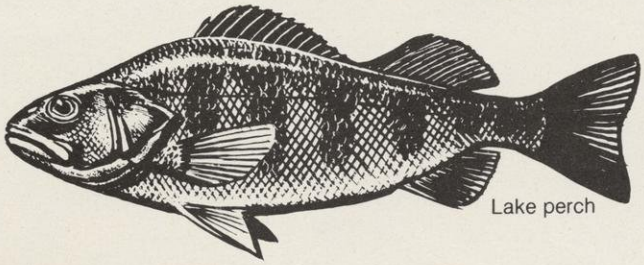
Musky hunters will continue to stalk "The Big Chip," the Minocqua Chain, Black River, Little Green Lake in Green Lake County, and Pewaukee Lake in Waukesha County, but the real sleeper may well be Lake Wisconsin. It's been stocked for a number of years and is starting to produce.

Stan Kmiotek, a cold-water fish specialist, predicts a banner trout season in 1981. Abundant rainfall the past few years has replenished groundwater which in turn enhances spring flow. Stream surveys show excellent hatches in 1979 and '80. Barring heavy



Brook trout

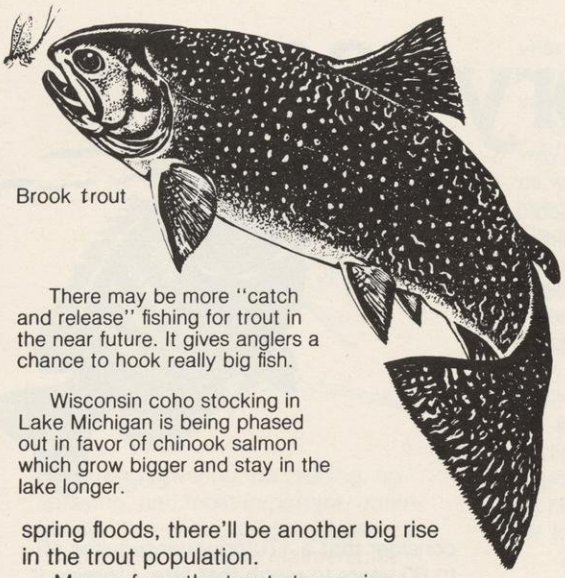
Trout fishing regulations in Wisconsin may someday be set regionally, based on similar soil types, geology, vegetation, acidity and hardness of streamwater.



Lake perch

Overcrowding causes stunting in perch and other panfish. A "big fish" management program for predator species could help with the problem.

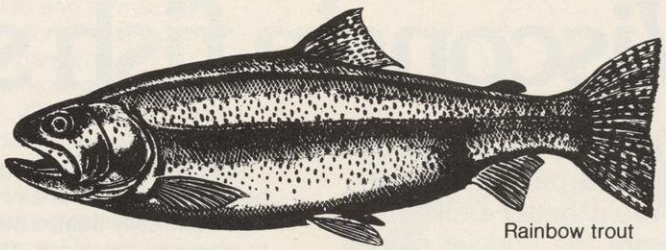
Illustrations by Bob Frankowiak, 4972 S. 20th St., Milwaukee, WI 53221



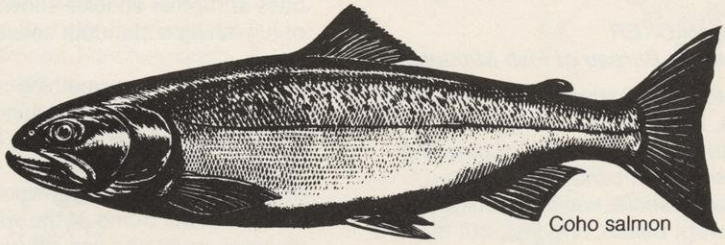
Brook trout

There may be more "catch and release" fishing for trout in the near future. It gives anglers a chance to hook really big fish.

Wisconsin coho stocking in Lake Michigan is being phased out in favor of chinook salmon which grow bigger and stay in the lake longer.



Rainbow trout



Coho salmon

spring floods, there'll be another big rise in the trout population.

Money from the trout stamp since 1978 has helped pay for improved habitat. Spawning conditions, food supply and protective cover have been upgraded on 63 miles of stream in the past three years. And trout are responding.

They move into improved areas so rapidly, at times they're literally under the feet of the stream improvement crew. So when you're out with a fly rod, look for newly improved portions of trout streams. They'll be fun.

Northern Wisconsin also abounds in spring ponds, famous for brook trout. In recent years, some 51 ponds with excessive silt deposits have been dredged back down to spawning gravel. DNR is rehabilitating them at the rate of two to three per year. With increased depth, and renewed spawning capability, each dredged pond is a potentially new fishing hole with exciting possibilities.

Lee Kernen, fisheries chief of the Great Lakes section, makes a number of predictions:

Anglers who fish Lake Superior regularly know that species and distribution have been changing. Lake trout are still the main sport fish and trolling for them is good. Around 10,000 will be creeled this year. But "hot spots" may begin to shift.

Trolling should remain good around Saxon Harbor but fish will continue to be small to medium in size. Lake trout numbers among the Apostle Islands are down slightly although it's possible to catch a large native fish now because the population from Gull Island Refuge continues to grow and spread out.

Fishermen in western Lake Superior should see improvement. Large numbers of lake trout were released near Superior/Duluth beginning in 1977, and should now start to appear in the creel as five year olds. Another bright spot in this same region is the walleye spawning run up the St. Louis River. They should be hitting by late May and into June.

Rainbow trout or steelhead will continue to have good runs on south shore streams. Coho, salmon and brown trout will be biting all along the Lake Superior coast.

As always, wind and weather will have a significant effect in Lake Michigan. The fish are there—more than five million of them have been stocked each of the past three years. Given the west winds to keep cold water upwelling on the Wisconsin shore, there is every reason to expect that Lake Michigan fishing will be very similar to 1980! That's best described as fantastic!

Rainbow, brown and brook trout are all available in numbers similar to the last few years. Lake trout fishing, too, should be good. Improvement is anticipated at the south end of the lake. It's not because there are more fish, but there are a growing number of trollers who target on lake trout and they seem to get better all the time at unlocking the secret to catching these fish on the bottom.

Chinook salmon have dominated the catch for the last few years and if stocking has anything to do with it — 1981 should be a boomer. Releases were doubled to two million beginning in 1978 so these should be more abundant than ever before. Most will range in the five to 12 pound size.

Well, that's a rundown of unusual fishing the average angler can explore. And then, there are three more that you may have considered and discarded: bullheads, carp and suckers. When the fast, soft nights of spring spell fishing fever, trot out your old rods and reels, some long-shanked hooks, nightcrawlers and a gas lantern. Go catch yourself a mess of bullheads! They bite fast and furious, and thousands swear they're "the best eating there is."

Or tie into a big carp one time, and don't be surprised if it snaps your rod with its bulldog way of battling. Suckers too, give good sport. And pickled, both taste like store bought — better because you made it yourself.

So Wisconsin waters in 1981 will be loaded with unique fishing experiences. And who knows—some of them may even be as exciting as the first four-inch bluegill you caught off the dock as a kid!

Smallmouth and largemouth bass may require separate management. The two occupy different habitat types. In some waters, both may be good candidates for so-called "slot-size" management.

Will Wisconsin's fishing trip?

The answer is a resounding "No" and efficiency, planning and new ideas are why. Luck doesn't have much to do with it.

JIM ADDIS, Director,
Bureau of Fish Management

In addition to causing other calamities, the ubiquitous runoff from inflation and high priced energy threatens to water down Wisconsin's fish management program. Faced also with inexorable habitat destruction and a persistent increase in the number of anglers, managers are casting about for places to apply the current universal cure-all: increased productivity. And, they've found quite a few. Things are optimistic.

Survival of the kind of fishing Wisconsin brags about will depend upon this new sense of efficiency. The program is being trimmed for it and the outlook is bright. But some of the distressing cost accounts and other strictures that led to this threshold need reciting. First the bad news, then the response:

1. In 1980, the price of truck mileage for moving fish from hatchery to stocking site rose from 35¢ to 70¢ per mile. This year it will hit $1.
2. Electricity is up 70%.
3. Federal aid is down by $157,000. More cuts are expected.
4. Fish rearing is expensive — Approximate costs are: muskies $13 a pound ($8 for hybrids), largemouth bass $8, splake $7, Chinook salmon $5.50, coho $5, lake trout $4 and brook, brown and rainbow trout all about $2. Merely collecting the minnows required to feed muskies is a $19 per pound operation.

Skyhigh prices define just about all of fish management's dollar problems! Efficiency can help. But the other problems resist. Things like:

1. Loss of habitat — as high as 5% a year for some species. Fish managers estimate that by 1990 the number of muskies will be down 8% and walleyes 7% from this cause. Other fish will also be affected.
2. A steady rise in fishing license sales of 1.3% per year. This means increased pressure — and it's aggravated by all the close-to-home fishing engendered by expensive gas.
3. Overharvest. Muskies are already in this category. So are the bigger sizes of several other species. And by 1990, under present regulations, anglers will be taking too many northerns.
4. PCBs in Lake Michigan and Mississippi river fish.
5. No lake trout reproduction in Lake Michigan.
6. Conflicts between sport and commercial fishing.
7. Acid rain that threatens to sterilize some northern lakes.
8. Beaver damage to trout streams. There is a devastating one dam per mile of stream in northeastern Wisconsin.

The two lists aren't complete, but they give the drift — dollar problems, habitat problems, quality problems.

Despite them, Wisconsin's fishery remains tremendously productive, popular, and healthy. There are 1¼-million sport anglers. This year in inland waters alone, they'll catch 55-million

TROUT

Ecological characteristics of Wisconsin trout streams vary with the geology and climate of the areas in which they're located. For example, trout water in the unglaciated southwest is hard and alkaline, in the northeast, soft and acid. Each region has characteristic soil types, vegetation, temperature and other common elements. All affect trout differently, yet regulations are generally set on a statewide basis. Managers are beginning to think Wisconsin streams could produce more trout if regulations reflected characteristics of the different regions. It would mean setting boundaries and forming rules designed especially for the waters within them. Look for plenty of discussion on this in the near future.

Two of Wisconsin's most popular fish: a walleye (left) and a northern. DNR stocks 95-million walleye fry per year, mostly in places where hatches fail. Effectiveness of this stocking needs evaluation. As for northerns, there's a suspicion that by 1985 anglers may be catching so many, populations will start to drop. Data are being gathered that will confirm or refute this notion. Photo by Lee Kernan

panfish, 2¼-million northerns, and close to 2 million each of bass, walleye and trout. The muskie harvest will be an estimated 67,000. Trips to the Great Lakes will total 1 ¼-million and the catch from them come to more than 500,000 trout and salmon, plus other species. So fish managers have some leeway to test solutions — to try new techniques and regulations. They'll junk the old ones that haven't worked and also junk the new ones that won't.

Here's a rundown on changes made so far that should pay out:

1. A new hatchery is in operation at Kettle Moraine Springs, close to Lake Michigan stocking sites. Inefficient distant hatcheries have been closed. This will mean shorter hauls, and reduced energy costs. Bigger tank trucks will handle more fish.

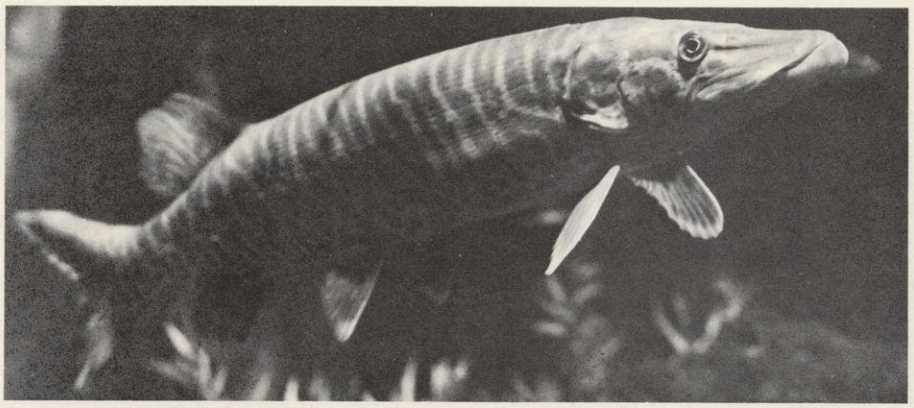
BASS

A new idea called "slot size limits" has improved bass fishing down South and might be tried in Wisconsin. It boosts the number of big fish for trophies, but lets anglers catch little ones for eating. The in-between sizes are available for catch and release, however, they're protected, and that way a lot more grow to trophy size. In the South, high size limits give better predation and result in bigger panfish by reducing stunting.

A typical slot size limit for bass would harvest fish under 12-inches and bigger than 15-inches. The objective is to protect the 12 to 15-inch fish so that more of them grow into the 15-inch plus class. The slot is usually adjusted both to the growth characteristics of the fish and to the characteristics of the water they live in, so that the slot protection encompasses a period of maximum rapid growth.

It's possible that slot size limits may be applicable to a wide range of species. They have already been applied to trout in the western states and may even work on muskies as well as bass and other northern species. But Wisconsin can't afford to jump into such a program without careful thought.

For example, size limits are greatly affected by hooking mortality. If fish hooked and released do not survive, the regulation will have no value. Also, northern waters may not respond as substantially to increased protection of intermediate sizes as those in the South. In some cases, catch and release regulations have actually resulted in a decline in the number of larger fish because the carrying capacity of the lake or stream had already been reached. Wisconsin should try the slot size limit, but do it with caution.



Muskie. Wisconsin's most important and expensive game fish. Demand is so heavy, anglers are catching too many to sustain a healthy population. Remedies proposed include an increased size limit, a season quota and registration. Photo by Dean Tvedt

2. Fish are being stocked earlier, anywhere from one to six months. This reduces costs, empties hatcheries sooner, and speeds up production cycles. Muskies, for example, are now being stocked in August rather than September. This saves three ways: rearing facilities shut down, minnow seining for feed (the $19 per pound kind) is eliminated at a time when muskie appetites are most voracious, and, since fish are smaller, more can be hauled per load on stocking runs. Many rainbow and brown trout are being moved out of the hatcheries six months sooner than before. The old practice was to stock in February or March. Now they're cleared from the hatchery in fall as six-inch fingerlings, big enough to assure survival. In addition to saving on feed and trucking, this clears the way for a new production cycle. Theoretically the number of fish turned out could double. Both changes will need monitoring to make sure return to the creel on muskie and trout remains as good or better than under previous practice.
3. A mixed bag of other innovations is being tried with muskies. Most spectacular are the 'dry feed' experiments. Unlike trout, which will eat pellets, muskie usually won't touch anything except a live minnow or bug. But last year, using their own patient techniques, DNR's hatchery workers led by Don Czeskleba raised 4,000 muskie on dry feed. If the technique is ever perfected, costs will drop dramatically. It's already being used successfully with hybrids. In other productivity boosters, muskie-food minnows are raised at low cost in fertile sewage treatment ponds, and, to cut down transportation, minnow ponds close to hatcheries are used whenever possible.
4. PCB levels in Lake Michigan fish are dropping faster than anyone expected. Last year, for the first time, tests showed less than five parts per million (ppm) in most species of trout and salmon, including chinook. Five is the limit set by the US Food and Drug Administrtion on fish sold in interstate commerce. At Strawberry Bay this year contractors will be allowed to harvest spawned-out coho for human consumption because PCB levels are below the limits.
5. Lake trout reproduction is expected to happen in Lake Michigan this fall, ending decades of failure. In 1976, using techinques that worked in Lake Superior, DNR planted 170,000 of this lamprey-decimated species on Sheboygan reef. Survival is good and spawning is expected in September. If successful, the long sought rebirth of this fabled native fishery may be just a matter of time. Implications are enormous because

MUSKIE

Muskies are trophy fish but Wisconsin anglers are catching too many. Without change it's inevitable numbers of big fish will decline. Although, like deer, muskies require precise management, unlike them, the exact nature and size of Wisconsin's harvest is unknown.

Three proposals have been made to correct these shortcomings and all need public support if the fishery is to be sustained: (1) A size-limit increase on selected waters from 30 to 34 inches. (2) A limit of four muskies per season; and (3) Mail-in registration. These ideas will be presented to the Conservation Congress and other interested fishing groups this spring. Without their endorsement, muskies are in danger, especially since energy costs and other inflation preclude making up population losses through increased artificial propagation.

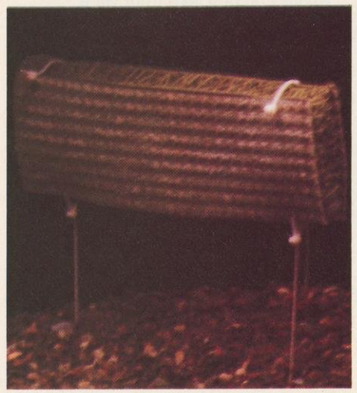
Eyed trout eggs in the hatchery. This year Wisconsin will stock about 1 1/2-million trout in inland waters. To boost productivity most will leave the hatchery in fall six months earlier than before. Photo by author

right now, the entire Lake Michigan trout-salmon fishery is hatchery produced. Along the same lines, managers are watching a chemical imprinting experiment at Algoma where 250,000 lake trout were planted last year. Minute quantities of the chemical with which they were imprinted will be dripped into the water, and, if all goes well, will impel the fish to return at spawning time. In another experiment aimed at restoring natural reproduction, researchers have wrapped trout eggs in Astroturf to protect against predators. These so-called 'sandwiches' are in 45 feet of water on Devil's Island Shoal in Lake Superior and await evaluation.

6. Wisconsin's Commercial Fishing Act of 1978 should help resolve sport-commercial conflicts on the Great Lakes. It clarifies DNR's regulatory authority, gives the department power to limit the number of commercial licenses, and to specify kinds of nets, amount of fish to be harvested and locations open to fishing. The Act requires DNR to establish a viable commercial fishery on the Great Lakes. It also creates two Commercial Fishing boards, one for Lake Superior and another for Lake Michigan to allocate catch quotas and deal with other industry problems. And finally, it provides for a 'catch fee' so that if stocked fish are ever again allowed to be taken commercially, sportsmen will not pay propagation costs. The industry will.
7. Habitat loss is being attacked in a variety of ways, but more needs to

Catching an eight pound coho is exciting. About half the coho caught on the Wisconsin shore are stocked by other states.
Photo by Dean Tvedt

be done. Using money from the trout stamp, DNR is rehabilitating trout streams, in effect, creating new habitat. So far, 63 miles have been improved. Wisconsin's successful municipal and industrial pollution control efforts have changed long-barren water into productive fisheries. The difference is especially notable on the Lower Fox, and portions of Green Bay and the Wisconsin River. Hope for many other streams has now been renewed as emphasis shifts to control of non-point pollution.



A lake trout "egg sandwich" made of Astroturf is suspended in 45 feet of water at Devil's Island Shoal in Lake Superior. The experiment is designed to protect eggs from predators. Another experiment with chemical imprinting is underway in Lake Michigan at Clay Banks near Algoma. A third will evaluate reproduction of trout stocked at Sheboygan reef.

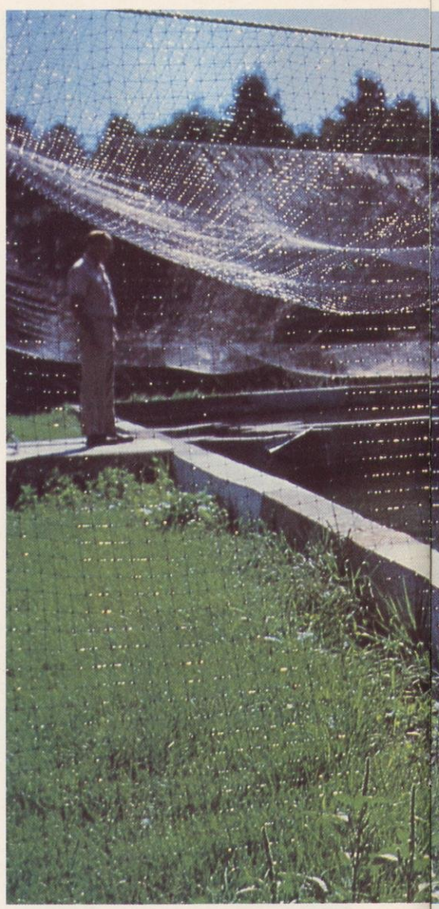
Northern and walleye spawning habitat has been preserved through purchase and easement. Shoreland zoning laws have helped prevent wetland loss, but enforcement often comes after the fact when damage has already been done. New proposals for wetland protection have good support. When a law finally passes that puts a stop to drainage, fill and development of the precious 2-million acres of wetlands that remain in Wisconsin, both fish and wildlife programs will breathe easier.

8. A $500,000 study on acid rain, financed by utilities in cooperation with DNR, is in the planning stage. It should define the extent of the threat to Wisconsin lakes and help locate the smokestacks causing it.
9. Cooperation from fishing clubs is at an all time high. Last year Salmon Unlimited purchased 100,000 chinook for stocking in Lake Michigan. The Sheboygan Great Lakes Fishing Club provided $5,000 to redevelop Kettle Moraine Hatchery raceways. Trout Unlimited helped pass trout stamp legislation and cooperatively improved many miles of stream. Muskie clubs have provided money for creel census work and equipment. These and other groups, including the Conservation Congress, vigorously back environmental measures needed to preserve the fishery.
10. The large number of stream-damaging beaver dams should start to decline as various control measures take hold. They include liberal trapping seasons, landowner control permits, dam removal, contract trapping, and habitat management.

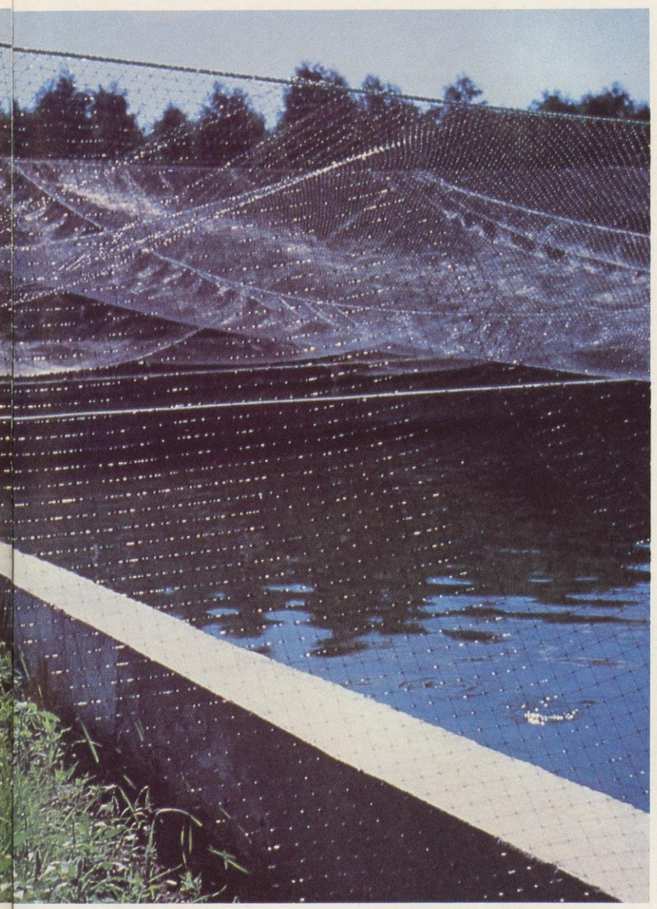
So the problems are big, but solutions are at hand. Fish management will become more specific, cost effective and productive. Dynamic techniques and regulations that are continually reexamined will help Wisconsin maintain its top place as a fishing state. Before everything, however, habitat must be agressively defended against degradation. DNR's fish management program is dedicated to that principle and needs all the help it can get. We hope it has yours. As long as it has, rest assured, fishermen's luck will be okay.

BIG FISH

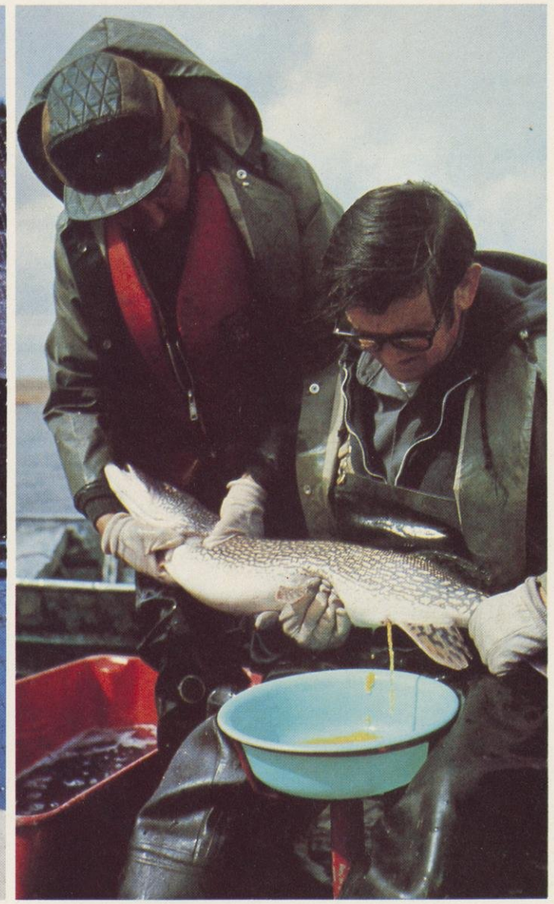
Most anglers would rather catch big fish than little ones. But Wisconsin has heavy fishing pressure and a long-time tradition of "maximum sustained yield" management. The aim has been to create the largest possible fish population, regardless of the size structure — lots of fish, relatively easy to catch, but not many big ones. This isn't real top quality sport fishing. But managers may find ways to provide it. One way is "catch and release" or "no-harvest" fishing. Tried at Castle Rock Creek in Grant county, catch and release attracted so many anglers it's now been expanded to Trout Creek near Barneveld. (A chemical spill there that decimated population made the change especially desirable at this time.) Most anglers will travel a long way for the chance to catch a 20 inch brown trout and usually they're more than willing to put it back. One fisherman reports that 1½ hours at Castle Rock Creek netted him four fish that measured between 15 and 18 inches, plus two more that got away. Anglers who like this kind of fishing will have to speak up. Sometimes there is local opposition to not being allowed to take the fish home.



Nylon nets protect hatchery fish from predation by birds.



Grackles, kingfishers and great blue herons are the worst offenders.



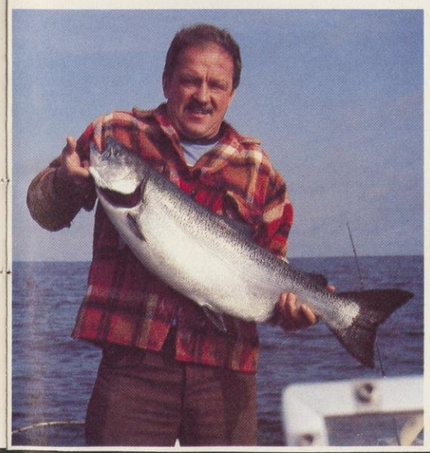
Stripping eggs from a female northern. Shortly after eggs hatch, DNR stocks the tiny northern fry wherever freezeout losses occur. This year freezeout problems were minimal.

COHO AREN'T KING

Chinook are also called King salmon. Wisconsin fish managers want them sovereign in the state's Lake Michigan stocking program, replacing coho. There are a dozen reasons why, but some anglers are reluctant to support the king because coho have brought plenty of big, happy returns. Fish managers say a lake laced with kings will be even happier. Here's why:

Chinook grow to 30 pounds or more. The state record is about 40. Maximum coho weight is 20 pounds but most are only five to eight when spawning takes place at age three. King salmon of the same age usually tip the scales at 12 to 18 pounds. Four year olds average 25 to 30.

Chinook spend four years in the lake before they spawn and die whereas coho reach the end of the line after only 1½ years in the lake.



This four year old Chinook salmon taken at Gills Rock weighed 24 pounds. Photo by Lee Kernan

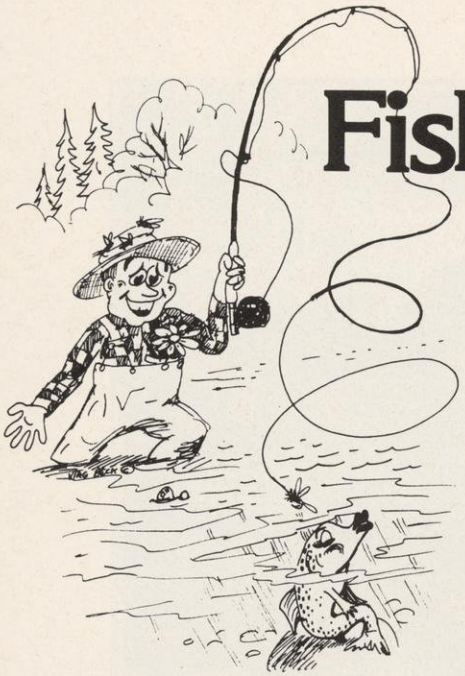
Chinook migrate to deep water off shore in winter, then return making them almost continually available to Wisconsin anglers. On the other hand, coho stocked by Wisconsin migrate to southern Lake Michigan where many are caught by people in Illinois, Indiana and Michigan.

Wisconsin anglers catch only 5% of the coho Wisconsin stocks. About half the coho Badger anglers catch were stocked by the state of Michigan, 9% by Illinois.

Stocking chinook will result in a vast increase in productivity — more and bigger fish cheaper. Coho must spend 1½ years in the hatchery before stocking. The king can be moved to the big lake in six months. Transportation and hatchery expenses nose dive. Coho cost 20¢ each. Chinook salmon 2½-cents. Only 300,000 coho per year can be stocked. Shifting to chinook instead will boost stocking to 750,000 or more.

Comparative figures favor the king three to one: 300,000 stocked coho will return 21,000 fish to the creel that weigh 126,000 pounds; 750,000 chinook will return 30,000 that weigh in at 390,000 pounds.

Despite all these advantages, many anglers who have learned how to catch coho hate to see the king take charge. To accommodate them, DNR plans to keep stocking coho at a reduced rate while encouraging the switch to chinook. Wisconsin anglers should end up with the best of both — their own chinook, plus the coho from other states.



Cartoon by Virgil Beck

Fisherman versus hunter

Which delirium is better, fishing or hunting? Here's a prejudicial ruling in favor of the angler. The reasons are elemental.

ROBERT TRAVER,
Former Michigan Supreme Court Justice

Some of my best friends are hunters. Why they should want to hunt so much baffles me — probably as much as why I want to fish so much baffles them. It is my belief that fishermen and hunters are two different breeds, comparative strangers who share only this in common: both happen to pursue their passions in the same environment, the woods. This no more unites them than sharing the same arena united the lions and early Christians. When hunters and fishermen do take a liking to each other, it is a clear case of the attraction of opposites. They are friends despite, not because of, their respective passions. As between friends everywhere, their trespasses are forgiven, their crotchets charitably overlooked.

In their monthly dilations the pundits of the outdoor magazines recognize that a difference exists. At five cents a word, they picture the fisherman as a reflective and fumbling fellow eternally wandering about the woods snagging his waders, misquoting Izaak Walton, pausing to pluck a wild flower, more often engaged in retrieving his flies from the tree tops—occasionally even catching a fish. On the other hand these same pundits picture the mighty hunter as a bronzed and steely-eyed chap, atavistic and elemental, one who lusts to kill simply because he must.

In their view, the effete fisherman cowers before violence and bloodshed and the loud noises of firearms; he is a kind of failed poet or strayed bird-watcher; the hunter is a swaggering caveman inadequately disguised by Abercrombie. The pundits and I agree only that there is a vast difference between the two; we come to a parting of ways over what that difference is and

*Reprinted with permission from *Anatomy of a Fisherman* by Robert Traver, published by Peregrine Smith Inc., Box 667, Layton, Utah, 84041; 120 pages, 100 color illustrations; $12.95 paper, $16.95 hard cover.

Photo by Louis E. Ulrich Jr.

what it signifies. After much pondering I'll plunge in over my waders and suggest that the true picture is quite the reverse: that it is the fisherman who is more nearly akin to man's earliest ancestors, the quiet one who in almost every sense of the word is more primitive.

Consider the hunter. Since the dawn of man he has sallied forth with his slings and arrows, stalked and spied his quarry and then, muttering a prayer to his tribal gods, hurled at it a projectile—rock, boomerang, poisoned dart, lance, arrow, or steel-nosed bullet. All hunters, ancient and modern, share one thing in common: once he has released his projectile the hunter has little or no control over it. He either makes a hit or he misses; if the former he's a hero, otherwise a bum.

Consider the fisherman. The quarry he stalks remains almost always hidden and unseen. Except where there are rising trout he can only wistfully hope; forever he pursues an elusive will-o-the-wisp. When he is lucky and gets a strike he becomes directly and personally engaged with his quarry by a pulsing extension of his arm—hand to rod to line to leader to fly. Unlike the hunter he is successful not when he smites a discernible victim who is usually fleeing both hunter and projectile in terror, but, infinitely more subtle and deceitful, when his unsuspecting quarry eagerly seeks out and impales itself upon his worthless lure. His art is enticement; the hunter's annihilation.

One may pause and ask at this point, "Haven't you plunged into a semantic bog? If the hunter 'annihilates' as you say, doesn't this mark him as more brutal and primitive?" My answer is no; more brutal perhaps, but not more primitive. By primitive I mean "pertaining to the beginning or origin, or to early times; original; primordial; primeval," to quote the very first entry in my doubtless primitive dictionary.

Early primitive man could annihilate nothing; puny in body and scarce in number he lived almost solely by his wits; simply to survive he had daily to elude and outwit the great swarm of fearsome beasts and reptiles and weird flying things that roamed and slithered and flapped about his ancient world. His boldness came later, much later, when through his cunning he had survived and multiplied, had contrived and perfected his aggressive weapons.

Indeed a good case can be made that only as man has evolved and come more and more to dominate his environment has he become more violently aggressive and brutal. Behold that finest flower of civilization, modern man, with his bristling arsenals of guided missiles and split atoms and—having failed to perpetrate enough mischief on this one—his dreams of invading other planets. Is he not the crudest of all, that is, less his old original pristine self, once subtle and infinitely patient, cunning and curiously innocent? But that is another and sadder story . . .

With the hunter the issue is rarely in doubt; either he hits and crumples his quarry or he misses and, shrugging and swearing, hopefully resumes the stalk. Once the fisherman becomes engaged to his fish the contest has only begun; throughout the struggle the adversaries are physically linked to each other; at any stage of the combat his quarry may escape; to the end the issue remains in doubt. Moreover, he stalks his quarry in that most ancient of elements, water, from which his remote ancestors originally crept; in a sense he is a wanderer searching for his past.

For those who associate "primitive" with elemental behavior and direct bodily collision, the fisherman is so utterly primitive he insists upon taking his quarry alive, virtually with his bare hands. Short of wrestling a bear, what could be more primitive than that? Speak to me not of gentle fishermen.

"But what about those occasional characters who appear to love both to hunt and fish?" Ignoring those neurotic folk to whom all hunting and fishing is but a massage of their egos, and who might be far better off chasing golf balls or compliant Bunny Girls, I challenge the premise and suggest that there simply *aren't* any men who love *equally* to fish and hunt. Those fishermen who occasionally hunt are merely lost souls whiling away the vast Sahara of time between fishing seasons—and vice versa.

Testament of a Fisherman

I fish because I love to; because I love the environs where trout are found, which are invariably beautiful, and hate the environs where crowds of people are found, which are invariably ugly; because of all the television commercials, cocktail parties, and assorted social posturing I thus escape; because, in a world where most men seem to spend their lives doing things they hate, my fishing is at once an endless source of delight and an act of small rebellion; because trout do not lie or cheat and cannot be bought or bribed or impressed by power, but respond only to quietude and humility and endless patience; because I suspect that men are going along this way for the last time, and I for one don't want to waste the trip; because mercifully there are no telephones on trout waters; because only in the woods can I find solitude without loneliness; because bourbon out of an old tin cup always tastes better out there; because maybe one day I will catch a mermaid; and, finally, not because I regard fishing as being so terribly important but because I suspect that so many of the other concerns of men are equally unimportant—and not nearly so much fun.

. . . One thing seems clear: most of the dedicated hunters and fishermen I know are far more faithful in their fashion than ever her lover was to Cynara. Each in his secret heart scorns the other's sport.

Granted that hunters and fishermen are basically different; the *why* of their difference is another and subtler question the victims are probably as ill equipped to answer as the recumbent patient in the psychoanalyst's confessional is to analyze himself. Indeed Freud and Jung together might have had difficulty differentiating the fisherman from the hunter, though they might draw some fine analogy involving the difference between seduction and rape.

I have my own dark suspicions about what troubles the fisherman, but I hesitate to unveil them in a medium that might fall into the hands of women and innocent children. For one thing, my fellow fishermen might get powerfully irked over such treason; for another, their neglected wives might grow even more forlorn to learn that such a subtle form of infidelity has been going on behind their backs all these years. For wooing a trout with a fly is almost precisely akin to the slow and patient seduction of a proud and reluctant woman.

There, I've up and said it. Henceforth I shall have to fish in the Antipodes.

The readers write

I'd like to add a sequel to the great gray owl story. In 1978 people said they weren't supposed to be breeding here in Wisconsin, but I never for a moment believed we somehow luckily stumbled onto the **only** Great Gray Owl family in the state. In 1979 I received more than 20 reliable reports of owl sightings in eight different northern Wisconsin counties during almost every month of the year. I'm quite confident that in time we will find breeding birds in Douglas, Washburn, Bayfield, Sawyer, Burnett and possibly Polk counties in the northwest. We may also find families in Forest, Oneida, Lincoln and Langlade counties in the northeast. Historical records show great grays as far south as Racine and Jefferson counties, as recently as 1948.

I hope Wisconsin residents and non-residents alike will become aware of these beauties and take the time to report any observations of large, unusual owls to me or to DNR offices. And one last request: If anyone knows of any mounted great gray owls, along with the date, time and place in Wisconsin where found or taken, please let me know so I can compile a record.

DON G. FOLLEN, SR., Arpin

Please cancel my subscription. I am disappointed in the quality of your magazine and I do not like the emphasis you place on deer hunting!

ROBERT E. DALTON, Oshkosh

My compliments on your November-December issue of Wisconsin Natural Resources — especially "The Last Hunt." I agree wholeheartedly with the phrase "satisfaction is based on expectation." DNR could help cool expectations by not constantly yelling about how many deer are here or there throughout the state. Such propaganda encourages very poor sportsmanship in some areas of Wisconsin. We who live in rural areas are not overjoyed with the population predictions, as it creates overcrowding here. The true sportsman knows the deer population on his own. Sell quality of experience, not just licenses.

JOHN McGREGOR, Poy Sippi

I enjoy every issue of *Wisconsin Natural Resources,* and January-February was no exception. The article, "Science Explains the Snowflake," was very interesting, but I wondered why no mention or credit was given to W. A. ("Snowflake") Bentley, of Vermont, for the work he did in studying and photographing the snowflake. Just curious.

EDNA WOLTER, Manawa

Wilson Alwyn Bentley was a somewhat eccentric Jericho, Vermont farmer and self-trained meteorologist who spent more than 50 years studying and photographing snowflakes. At the age of 15, Bentley received a microscope as a gift and was fascinated by the myriad of snowflake shapes and patterns it revealed to him. A lifelong bachelor, when "Snowflake" Bentley died in 1931 he left behind a collection of thousands of photographic plates and a body of work and technique that has fed the interested and curious ever since.

I'm writing in response to "Public, Where Are You?" in the November-December issue. I agree that public participation in resource management is very important, but I disagree with the proposed solution to the problem.

Technical information may indeed be difficult to understand, but questions like "Does the water smell or taste good?" are entirely too subjective to be helpful and are so simplistic that many people would consider them insulting.

Technical readings and data can be significantly understood and discussed by the public if compared with related information. Rather than asking for comments out of the blue on pH levels in some lake or stream, first give the public a short explanation on what pH means. Then explain how the present reading compares with other water around the state or country, what government guidelines require and what the same water was like ten or twenty years ago. This sort of approach could be used straight across the board, regardless of the issue, and I believe the public would then participate more in government decisions.

As an issue becomes more important, it becomes more of a technical problem for experts. In the process, people are often robbed of a chance to participate in decisions that affect them greatly and that they support through tax dollars. If the problem is a round peg in a square hole, it must be made to fit. Government for and by the people must be maintained. Resource management needs public participation in decision-making, or else government won't have public acceptance of the decisions that need to be made.

EUGENE J. DUNK, Colonial Park Naturalist, Racine

I read with interest your article "Timber Wolves Return" in the January-February "Catch-all" section. While bow-hunting for deer in October, my son observed two timber wolves in Sawyer County east of Winter, Wisconsin. He was hunting from a tree and both wolves passed within 25 yards beneath him. Just to be sure, he made positive identification from a reference book after we returned home.

I just thought this might interest you, since your article mentioned only wolves in Lincoln and Douglas counties.

I enjoy your magazine!

GORDON HEYERDAHL, Janesville

I'd like to inform you of one lonesome timber wolf that's been spotted in Florence County, Township of Fence, between the Pine and Popple Rivers. It must be a big male, for he urinates on trees. His tracks in the snow measure 4 by 4 1/2 inches and his stride is about eighteen inches. A few woodsmen in the area have seen him, heard his howling and found his kills.

I've also seen a great gray owl on two different occasions in different parts of Florence County.

STANLEY MAJEWSKI, South Milwaukee

In the November-December issue someone suggested that you run a map to locate places in the state that an article refers to. May I second that? That's been my feeling from the very first issue I received. In fact I wrote a letter suggesting it once before, but never mailed it. I'm glad others feel the same as I do.

It's just plain misery to have to dig out a road map and look for some obscure place in order to see where the heck the story is taking place. After all, not everybody in Wisconsin lives in *that* particular place. So let's see some little maps — please?

By the way, "X" marks the area where *I* live, OK?

CLARA HABEDANK, Avoca

Alright, Alright, you win. We concede. Maps will be forthcoming in future issues. Write to let us know what you think of them.

An article you printed awhile back about hiking the Ice Age Trail briefly mentioned the "Blue Hills" area east of Rice Lake as once being the highest mountain range in North America. Can you tell me more about them?

BERNARD J. MITCHELL, Milwaukee

Mike Mudrey of the Wisconsin Geological and Natural History Survey replies:

"The Blue Hills of Rusk County are held up by Barron Quartzite, ageologic unit about 1,780 million years old, originally thick sandstone. Through geologic time, the sandstone became indurated, or hardened, was lifted above sea level and has been eroding slowly for the past 1,300 million years. The rock forms in the Blue Hills are similar to those in the Baraboo Bluffs.

The glacial geology of northwestern Wisconsin is poorly understood. Geologic evidence to date suggests that most, if not all, of the Blue Hills were covered by Wisconsinian ice, the most recent glacial advance. This probably occurred about 10,000 years ago."

I just want to take a few minutes to tell you how much I enjoy reading *Wisconsin Natural Resources* magazine. I especially enjoyed the article about "The Crow" by Justin Isherwood in the January-February issue.

During the winter months I feed three crows that wait for me in a nearby tree every morning. In October my son and I took a trip to Canada and saw literally hundreds of them migrating south to Wisconsin and beyond.

They're one of my favorite birds, thanks again for the nice article — I'm going to save it.

MRS. DEL FENNER, Plymouth

I was first introduced to *Wisconsin Natural Resources* about a year ago. During that time I have enjoyed many of the articles printed within it. I'd like to commend you on your efforts in three areas:

1) Informing your readers on the lives and habits of various animals, birds, and plants.

2) Explaining DNR's efforts to care for and improve Wisconsin's natural environment.

3) Giving your readers a chance to voice their thoughts and feelings in such ways as the fish and wildlife questionnaire last summer.

I'm convinced that criticism — often leveled by vociferous opponents of almost anything DNR attempts — shows a profound ignorance on the part of the critics. Perhaps that explains in part the fact that some of the loudest critics I know are men who wink at local poaching activity and decry wardens' attempts to do their job. Yet these same men blame DNR for their failure to bag a buck during deer season. It looks as though you'll never win, as long as you are so convenient a scapegoat for every uninformed boob who comes along.

Two more thoughts . . . First, I especially enjoyed Dean Volenec's article, "Epilogue of Ecology," and the new "Catch-all" section in the January-February issue. Second, I was pleased to see the report regarding timber wolves here in Lincoln County and I'd like to learn more.

SCOTT SANDERSON, Merrill

Reading Dean Volenec's article "Epilogue of Ecology" brought back a lot of memories from the early days of Wisconsin's environmental program. For those of us involved, it was a time of much frustration, where the biggest obstacle was not so much technology as apathy and indifference.

Your readers may be interested to know that Dean retired in January, after 30 years of outstanding service to Wisconsin.

JIM LISSACK, DNR West Central District Director, Eau Claire

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

Wisconsin's carnivorous plants

In places where otherwise there wouldn't be enough nutrients, insect-eating plants can thrive. And they're selective! The bugs that pollinate escape.

CORNELIA BURR,
Institute for Environmental Studies

The carnivorous plant often conjures up tropical images from a Saturday afternoon matinee where tendrils of medusa-like vines grab and entangle unsuspecting adventurers. Readers familiar with these hyperbolic fantasies may be pleasantly surprised to discover that real-life varieties are not only unimposing and benign, but are among Wisconsin's most attractive plants.

Found almost exclusively in wetlands, carnivorous plants inhabit special microhabitats, such as acid bogs or alkaline fens. There are good reasons for this. Acid sphagnum bogs form in wet pockets where there is hindered drainage. Sphagnum moss has a peculiar quality which enables it to modify its habitat and accelerate acidification. Interestingly, sphagnum moss is one of the few plants which actually causes significant chemical modification of its habitat. At the other extreme, wet fens, fed with mineral-rich water, receive an unusually high calcium load, and consequently fen peat is extremely alkaline. Heavy acid or alkaline conditions in the peat of these special habitats interfere with natural nutrient cycling. Many kinds of vegetation are therefore unable to subsist in fens and bogs. Carnivorous plants, however, are at a competitive advantage in these "physiological deserts" because they are able to supplement their diet with readily-available insect prey. It is a strange paradox that such plants must have adaptations that capitalize on efficient nutrient use, when the wetlands themselves are veritable storehouses of organic materials. Peculiar chemical conditions in fens and bogs "lock up" important nutrients in the organic peat substrate.

Because carnivorous plants are adapted to special habitats, they are relatively rare, and should be treated with care. The impressive assemblage indigenous to Wisconsin includes one species of pitcher plant, eight species of bladderworts, four sundews, and one butterwort.

Pitcher plants

The Northern pitcher plant (*Sarracenia purpurea* Linnaeus) is the most visible of Wisconsin's carnivorous plants. Though most commonly found in acid sphagnum bogs, pitcher plants are also able to subsist in alkaline fens. The pitchers, however, take on different forms in different chemical habitat types. In sphagnum bogs, they commonly have only a few pitcher leaves, whereas in fens, single plants may have many diminutive pitchers.

Termed "passive traps," the pitcher-shaped leaves capture insects by drowning them in the pitcher liquid. Although the plants have no active trapping mechanisms, a variety of physical and chemical features serve to lure prey and facilitate a successful capture. Thought to resemble flesh, the mottled, red-veined pattern on the pitcher leaves catches the attention of unsuspecting flesh-eating carrion flies. Glistening at a strategic point at the tip of the pitcher trap, a nectar "reward" coaxes passing insects. Once an insect lands on this spot and attempts to forage, it is confronted with a patch of downwardly pointing hairs on the pitcher's interior. Losing its footing, the prey falls into the pitcher liquid, and the plant eventually consumes it. The liquid contains a variety of chemicals, including necessary digestive enzymes. A special wetting agent actually reduces the surface tension of pitcher water, and exacerbates the plight of insect prey.

In late May and early June, unusual umbrella-shaped flowers rise on tall stalks, about a foot over the pitchers. Their red to maroon flowers compose an impressive exotic display. In a light breeze, one can detect their delicate rose-like fragrance—a pleasant contrast to the sulfur odor of sphagnum peat.

Most researchers become so fascinated by the bizarre elegance of the pitcher traps that they overlook equally intriguing features of the flowers. However, I have personally observed patterns of insect visitation to the flowers for two summers. Under natural conditions, the plant is dependent on these visits for pollination. However, in the laboratory, flowers are physiologically capable of self-pollination and I have actually germinated seeds produced in this manner. However mechanical barriers, inherent in the unique umbrella design prevent this from occurring naturally.

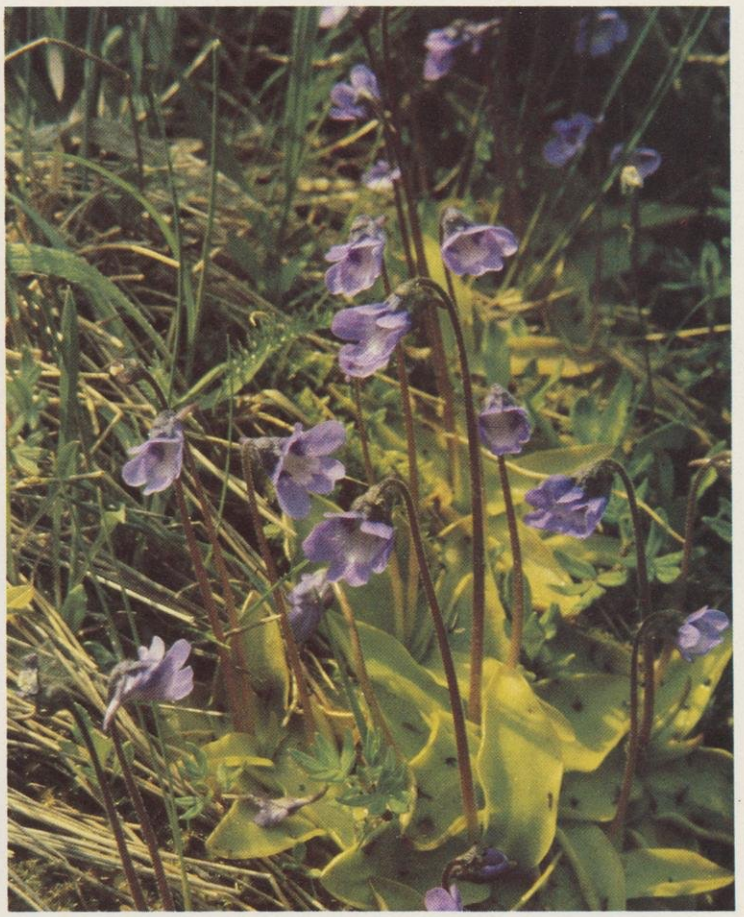
Since pitcher-shaped leaves are well engineered for insect capture, and flowers are dependent on regular insect cross-visitation, it appears that the plant has learned to orchestrate contradictory functions. The pitcher plant flower seems to reconcile the problem by attracting insects which are not likely to fall prey to the pitcher.

Bees were the most prevalent visitors to the flowers I studied. Several bumblebee species forage on nectar rewards inside the flower, and also collect pollen for later consumption. A variety of smaller bees also visit. Nectar provides bees and their offspring with a valuable energy source. The bees, in turn, serve the plant by fertilizing it. They accomplish this by bringing their pollen-laden bodies in touch with the flower's stigmatic surfaces, which project from the tips of the "umbrella" style. Smaller bees move about more freely within the flower. Often visits by small worker bumblebees are marked by a rasping, high-pitched buzzing sound. The bees actually vibrate pollen from the anthers, and store it in "pollen baskets." While some pollen is then transferred from flower to flower, pollen collected in baskets rarely contributes to the process of pollination.

Other insects, such as flies, apparently take nectar and give little in return, as they are not efficient pollinators.

Sometimes a bumblebee accidently stumbles into a trap, and in its distress, emits a loud buzz, being quite incapacitated. In general, most bees are able to evade capture. Flies and ants meet a more unfortunate fate, as they are most frequently reported in examinations of trap contents. Donald Schnell, an authority on carnivorous plants, says that an occasional frog skeleton shows

Bladderwort. Its trap door can capture an insect in 1/460th of a second. Photo by author



Butterwort. Found on only a couple Apostle Islands in Wisconsin, its leaves act like flypaper to capture insects. Photo by Kitty Kohout

up in a trap. Frogs find the abundance of readily available flies tempting fare. In turn, frogs are sometimes trapped by their own plundering. I even saw enterprising spiders spin webs over the pitchers, to take advantage of the plant's prefabricated arsenal of attractive features.

Although flies are common prey, some are also floral visitors. Flies seem to be poor pitcher plant pollinators. The flies I observed did not move rapidly from flower to flower, and their sparse bristles provided poor receptacles for pollen collection. In rain storms, flies take a utilitarian approach to the umbrella-shaped flower by piling into it for protection.

Sundews *(Genus Drosera)*

Wisconsin's four species of highly photogenic sundews include *Drosera rotundifolia, Drosera intermedia, Drosera anglica,* and *Drosera linearis.* The latter two species are included in Wisconsin's list of threatened and endangered species. Appropriately, sundews derive their name from the Greek word *droseros,* which means "glistening in the sun." Wisconsin's sundews are most prevalent in acid bogs, but some, such as *Drosera linearis,* thrive in alkaline conditions.

Tiny dewdrops, which glisten from the tips of finger-shaped projections on the leaves, are far from innocuous to small insect visitors. Sundews also conduct a sophisticated game of biochemical warfare. Sweet nectar secretions lure insects to the leaves. Again, a combination of visual cues, such as light patterns and coloration, plus sweet odors from nectar droplets may serve to lure prey. Too much of a good thing is fatal for an unsuspecting insect. The sweet secretion on the sundew leaves is also very sticky, and serves as a natural adhesive, gluing its victim to the leaf. Another set of special glands are responsible for setting into action a leaf-rolling motion. Slowly the leaf folds, and further prevents escape. Then the plant's digestive enzymes take over.

Different species may often be distinguished by their leaf shapes. *Drosera rotundifolia and Drosera intermedia* have circular leaves. *Drosera anglica* has more flattened, spatula-shaped leaves. *Drosera linearis* is appropriately named, with straight pencil-shaped leaf blades.

Sundews flower in mid-summer. Their tiny buds are lined up on a slender stalk, like beads on a chain. The buds open one at a time, releasing small, inconspicuous, bowl-shaped flowers. Although some small insects visit the flowers, they are not dependent on insect pollination. Most species may rely on a process of self-pollination, which occurs at night, when the flowers are tightly closed.

Bladderworts *(Genus Ultricularia)*

A casual observer in Wisconsin's wetlands may easily overlook the bladderworts. It is only through close observation that these tiny, threadlike plants may be appreciated. At first glance, their knobby appearance does not reveal anything out of the ordinary. The sophisticated adaptations of the tiny bulb-shaped trap mechanism are only evident in microscopic observation. Researchers who study the mechanism which causes lightning-quick captures, are fascinated by its intricacy. Donald Schnell describes the traps in detail in his book, *Carnivorous Plants.* The modified leaf trap is only millimeters in size, but is highly structured. At one end of the tiny bulb is a small "door" loosely sealed with a thin layer of mucilage. Inside the trap, special glands are thought to regulate water pressure. These glands absorb water inside the trap, so that the pressure outside is greater than that inside. When the trap is set to be sprung, a negative, or suction pressure exists inside. Sensitive "trigger" hairs

that surround the opening set off the trap. A "victim" such as a tiny water insect, protozoan, or crustacean, brushes against the hair. This triggers what is thought to be an electrical impulse, and flips the door flap into the trap. Once the door is open, suction action pulls the prey in. Finally, the door is hinged only one way to prevent escape. The entire process takes place in about 1/460 of a second.

DNR's William Tans, an expert on Wisconsin's *Utricularia,* says there are eight native species of bladderworts which inhabit Wisconsin bogs, lakes, wet meadows and marshes. Bladderworts require calm standing water. Sometimes aquatic species are anchored, but most are free-floating.

In contrast to the inconspicuous bladder traps, the aerial flowers of *Utricularia,* which flower in the summertime, are showy and attractive. They also rise on tall scapes, at a safe distance from the insect-trapping mechanism. Floral colors include white, yellow, and purple, all colors which are particularly attractive to bees. Also, the flowers are trumpet-shaped, a characteristic common among insect-pollinated flowers. Bladderwort flowers are often of two forms, "cleistogamous" (closed), and "chasmogamous" (open). The "cleistogamous" flowers are permanently closed, and may form viable seed by self-pollination. The "chasmogamous" flowers are open, and their trumpet shape encourages visitation by insects. Interestingly, although the "chasmogamous" flowers are structurally designed to encourage insect visitation, they may also produce viable seed in the absence of pollinators. It appears that the bladderwort has developed a multiplicity of survival strategies to give it a competitive edge. This may be one reason why bladderworts are the most ubiquitous of the carnivorous plants.

Butterworts *(Genus Pingulcula)*

One species of butterwort, *Pinguicula vulgaris,* L. is confined to Wisconsin's Apostle Islands. Deriving its name from the Latin word *pinguis,* for fat, the butterwort has greasy leaves. This plant also has a system of chemical attractants and enzymes which ensnare and digest small prey. Sticky glandular secretions fix prey to the leaf surface, and digestive enzymes complete the process. The butterwort's simple trapping mechanism may be compared to household flypaper.

Butterworts have complex trumpet-shaped flowers, which are designed to maximize the plant's chances of being cross-pollinated. The floral parts are located deep within the tube, and their intricate arrangement creates mechanical barriers to self-pollination. Butterworts flower in late summer.

Pitcher plant in a sphagnum bog. For cross pollination the flowers *(inset)* attract insects that won't fall prey to the pitcher. Photos by Richard King

Right: Sundew. The plant's tiny dewdrops are fatal to small bugs. Photo by author

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