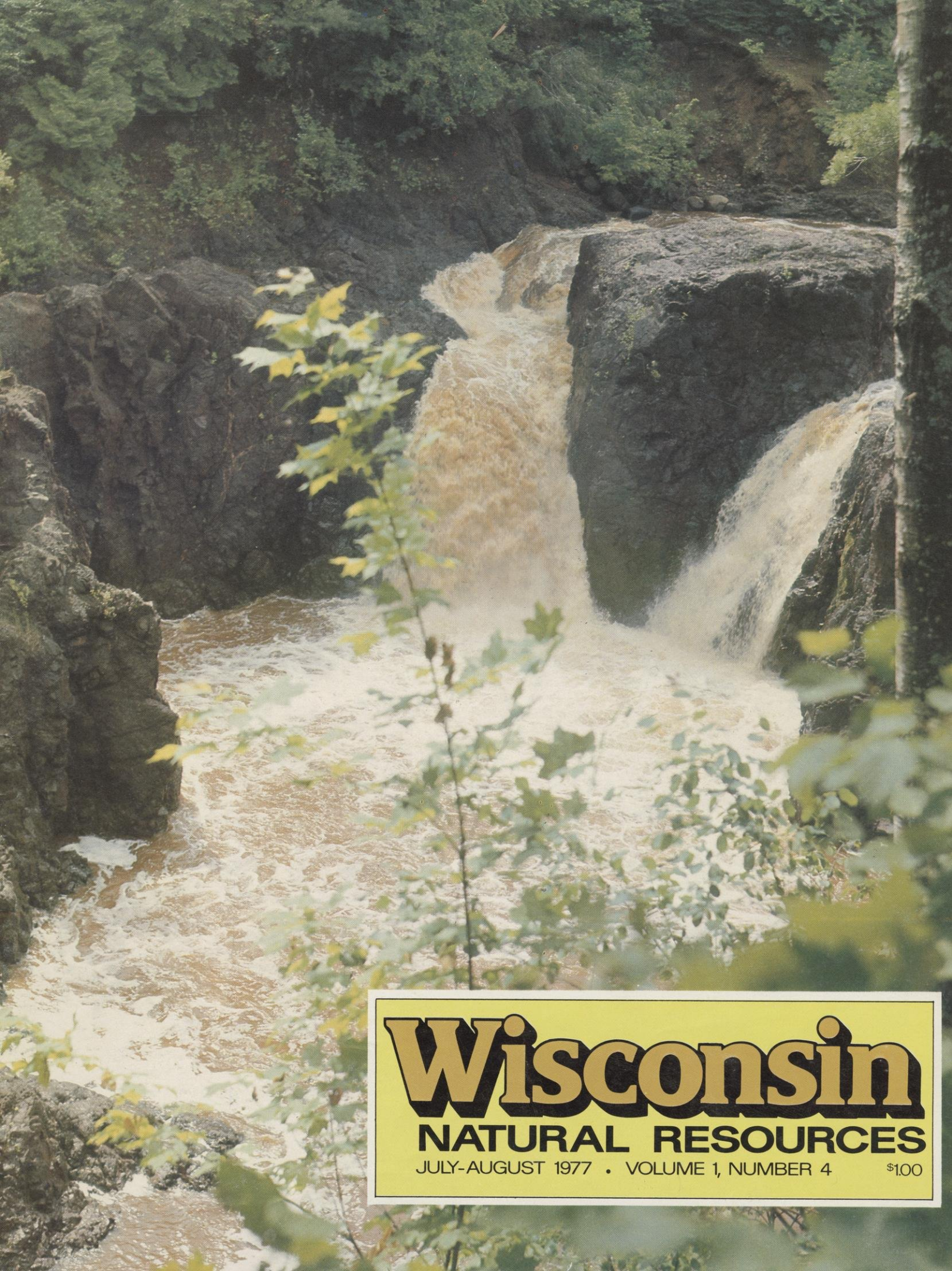
Wisconsin natural resources. Vol. 1, No. 4 July-August 1977

Madison, Wisconsin: Wisconsin Department of Natural Resources, July-August 1977



Wisconsin NATURAL RESOURCES

JULY-AUGUST 1977 • VOLUME 1, NUMBER 4 $1.00

Cecropia moth larva

JOHN BAKER, UW-Entomologist

This thumb-sized larva will become next summer's Cecropia, the large rust and white silkmoth that flaps its wings nights against your porch light and window screen. During its 20 to 26 day flight period the female may deposit up to 300 eggs in small clusters on the underside of leaves. When they hatch the larva feeds from late June to late September on leaves of woody plants such as willow, lilac and dogwood. Harmless orange knobs located behind the head, protect it by frightening predators.

The larva changes color through five stages of development, and finally spins a gold, spindle-shaped cocoon in fall. If all goes well, it emerges about nine months later as a Cecropia, Wisconsin's largest silkmoth.

Contents

Features

Wisconsin Natural Resources
July-August 1977 Volume 1 Number 4

Wisconsin Natural Resources is an official bi-monthly publication of the Wisconsin Department of Natural Resources, 4610 University Avenue, Madison, Wisconsin 53705

Subscription rates are: $4.50 per year, $8.00 for two years and $11.50 for three years. Single copies $1.00. Notification of address changes must include mailing label and new address. Allow six weeks. Send subscription information and requests to: Wisconsin Natural Resources, P.O. Box 7191, Madison, Wisconsin 53707.

Second-class postage paid at Madison, Wisconsin.

Editor/J. Wolfred Taylor • Design & production/Paul Tofte/Design

Front Cover:

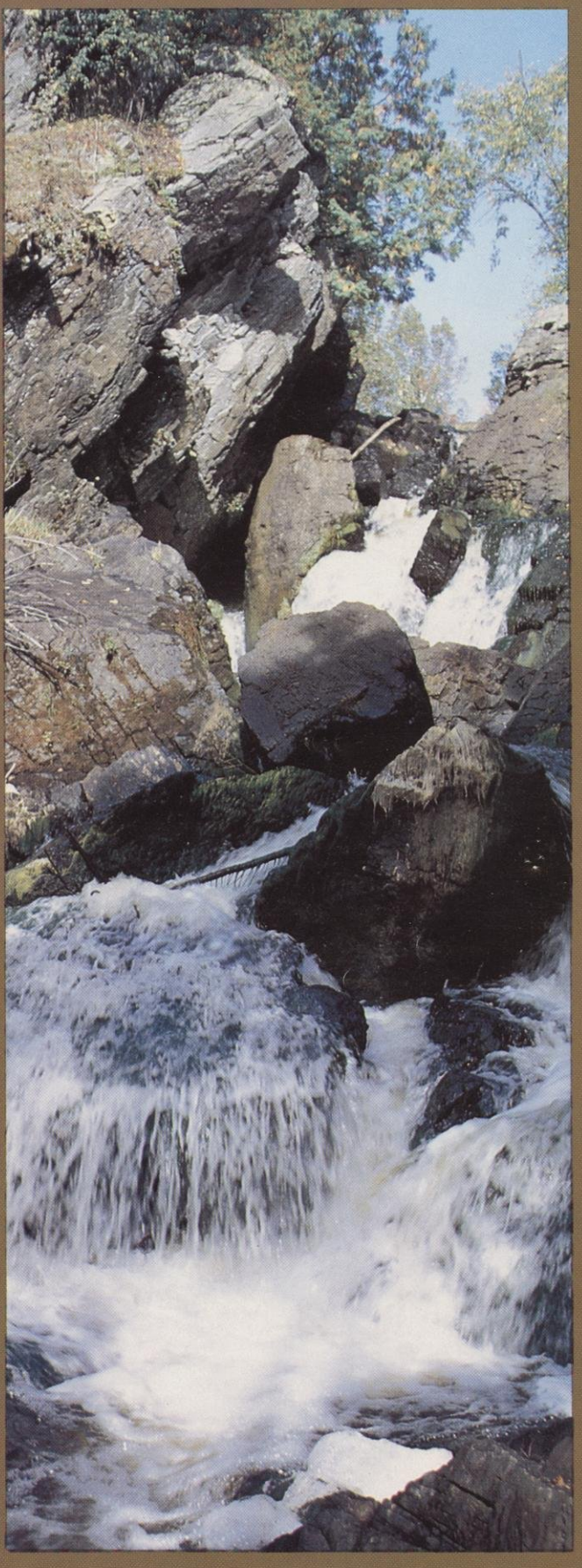
DNR photo

Forty feet high, Copper Falls is located on the Bad River at Copper Falls State Park in Ashland County. For more on state waterfalls see page 4.

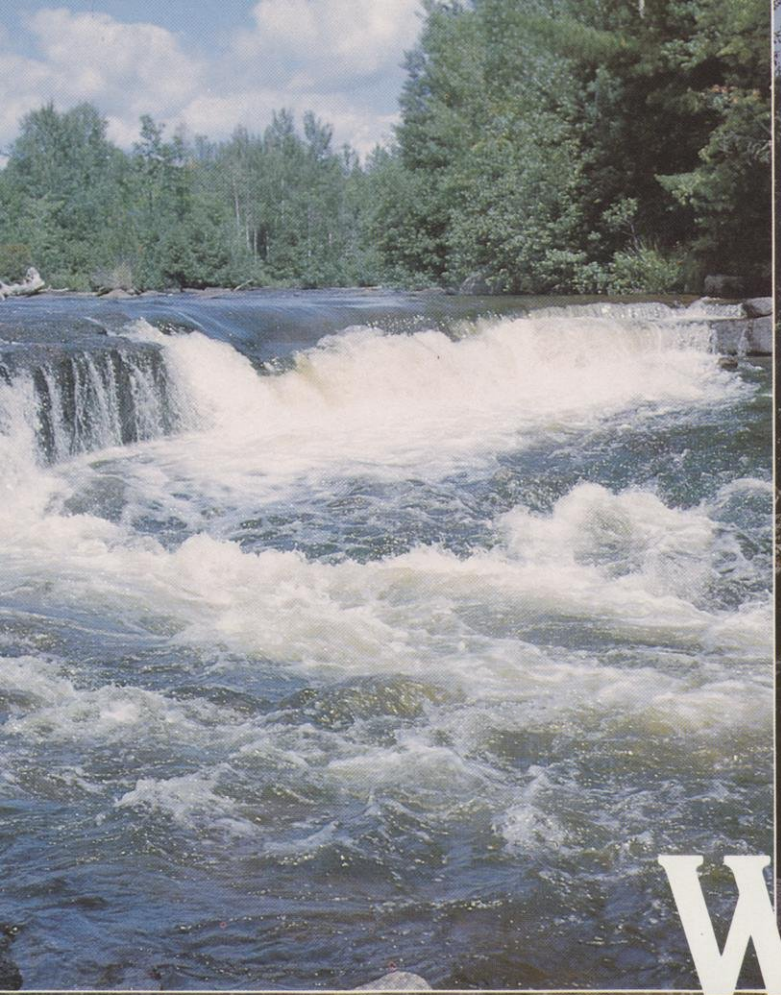
Back Cover:

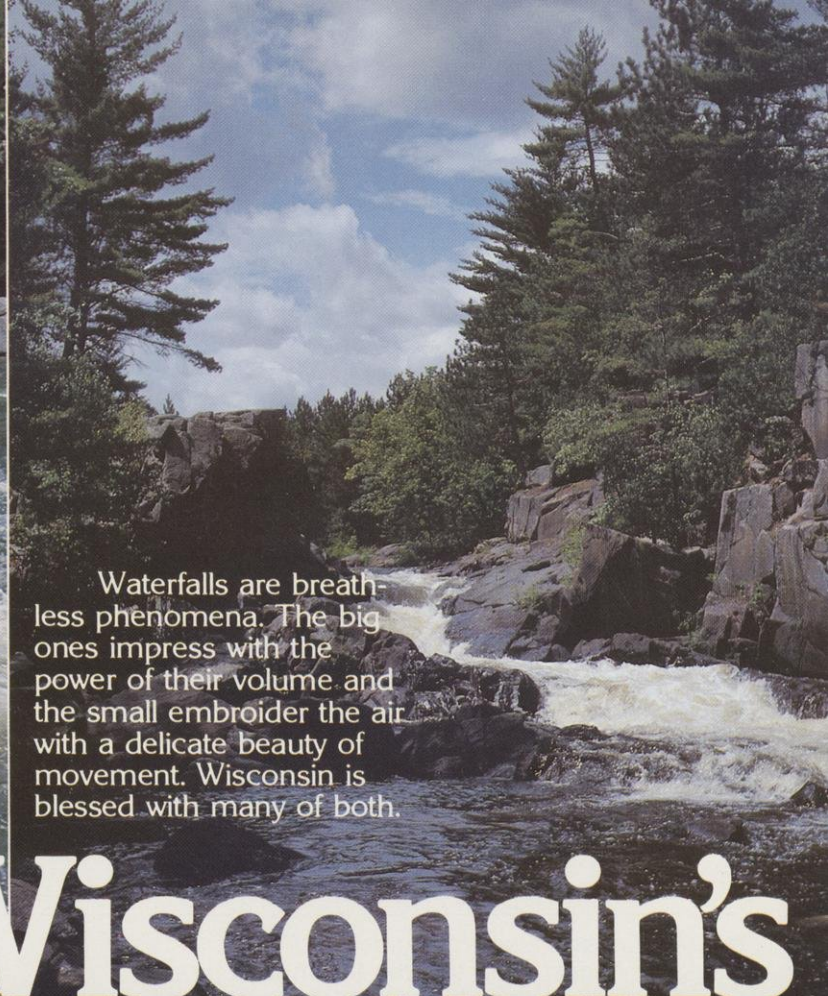
by George J. Knudsen, Chief Naturalist, DNR

This Regal Fritillary butterfly is the rarest and most beautiful of Wisconsin's five species of "silverspots." It is found locally in sandy fields in the southern half of the state. Named for the large silver spots on the underside of their wings, the upper wing surfaces have black crescents, spots and bars on an orange-brown to yellowish-tan background. Several kinds are common in open fields, meadows and marshes and can be easily observed when they alight on flowers.



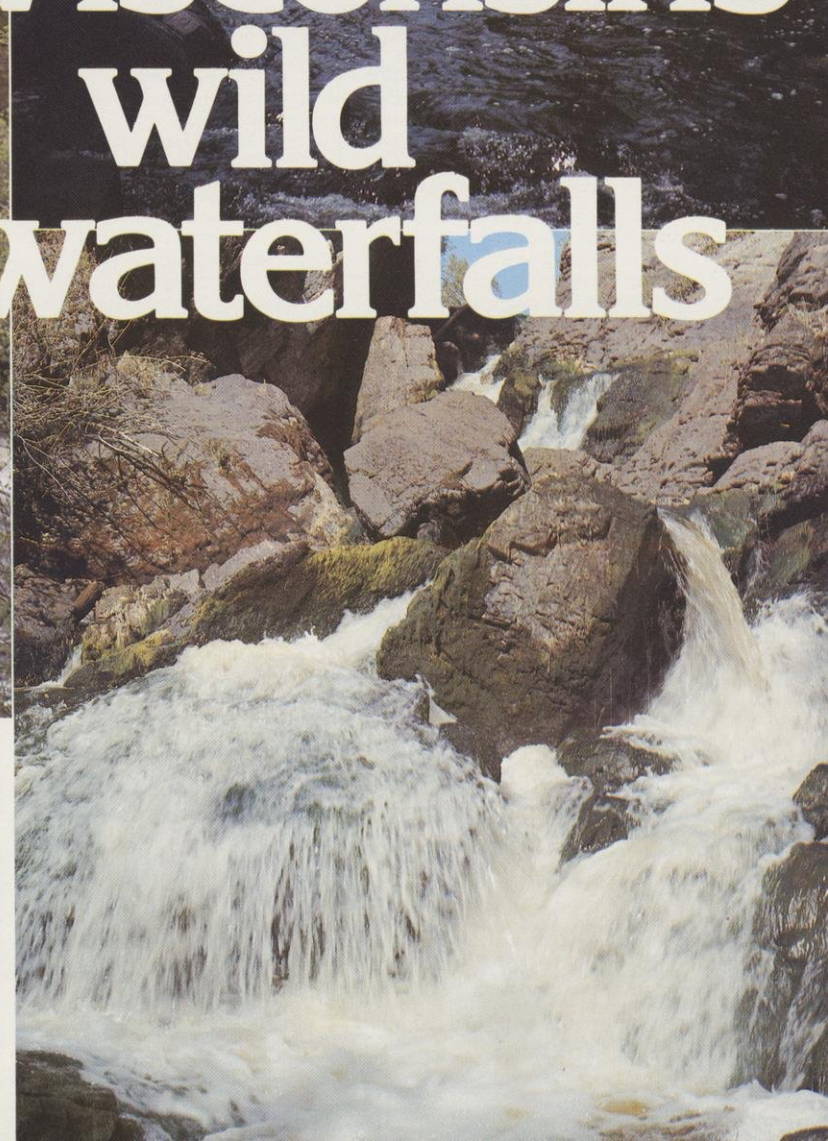
WISCONSIN DEPT. OF NATURAL RESOURCES





Waterfalls are breathless phenomena. The big ones impress with the power of their volume and the small embroider the air with a delicate beauty of movement. Wisconsin is blessed with many of both.

Wisconsin's wild waterfalls



Top left: *SULLIVAN FALLS* on the Wolf River in the Menominee reservation.

Top right: *DAVE'S FALLS* on the Pike River near Amberg.

Bottom left: *LITTLE MANITOU FALLS.* This and its larger namesake are in Douglas County at Pattison State Park on the Black River.

Right: *LONG SLIDE FALLS* on the Pemebonwon River in Marinette County at Morgan Park.

Far right: *LASALLE FALLS* on the Pike River in Florence County. Shoreline along this falls was recently purchased as part of the Wild Rivers Program.

Photos by: Dean Tvedt, Staber Reese, Bob Durst, Jerry Kiesow

STANLEY L. JOHANNES, Fish Manager, Spooner and
MILTON E. BURDICK, Area Fish Manager, Marinette

Wisconsin's most renowned waterfalls are along the south shore of Lake Superior and in parts of Florence and Marinette Counties. The Wolf River also has famous falls and the rapids, chutes, dalles cascades and gorges of numerous other Wisconsin streams form a spectacular kind of water sculpture that attracts and fascinates.

Falls usually occur where streams flow steeply downward over hard rock ledges that have resisted erosion.

In the region south of Superior known as the Douglas Copper range, the escarpment above the lake slopes northward at a rate of about 300 feet per mile. Geologically, this precipitous drop was probably made even steeper by the ancient "graben" that formed the Lake Superior basin. A kind of natural trough, a graben is created when a block of the earth's crust slips downward between two parallel faults. The word means "ditch" in German. Big Manitou, Wisconsin's highest waterfall (165 feet) in Pattison State Park is located in the Douglas Copper range.

Further east, many falls are found in conjunction with water gaps in the Penokee Range (118-million year old mountains that in Wisconsin stretch from Hurley to a little west of Mellen) . Formed by stream erosion, these gaps also created such waterfalls as Morgan in Ashland County, Marengo in Bayfield, and Wren, Potato River, Foster and Upson Falls in Iron County. The water gaps are also natural passes through the mountains which are still used as transportation routes.

In Marinette and Florence Counties, numerous beautiful falls have developed where hard Pre-Cambrian rock abutted softer Paleozoic sandstone. The sandstone eroded away but the harder rock remained as ledges and a waterfall was the result.

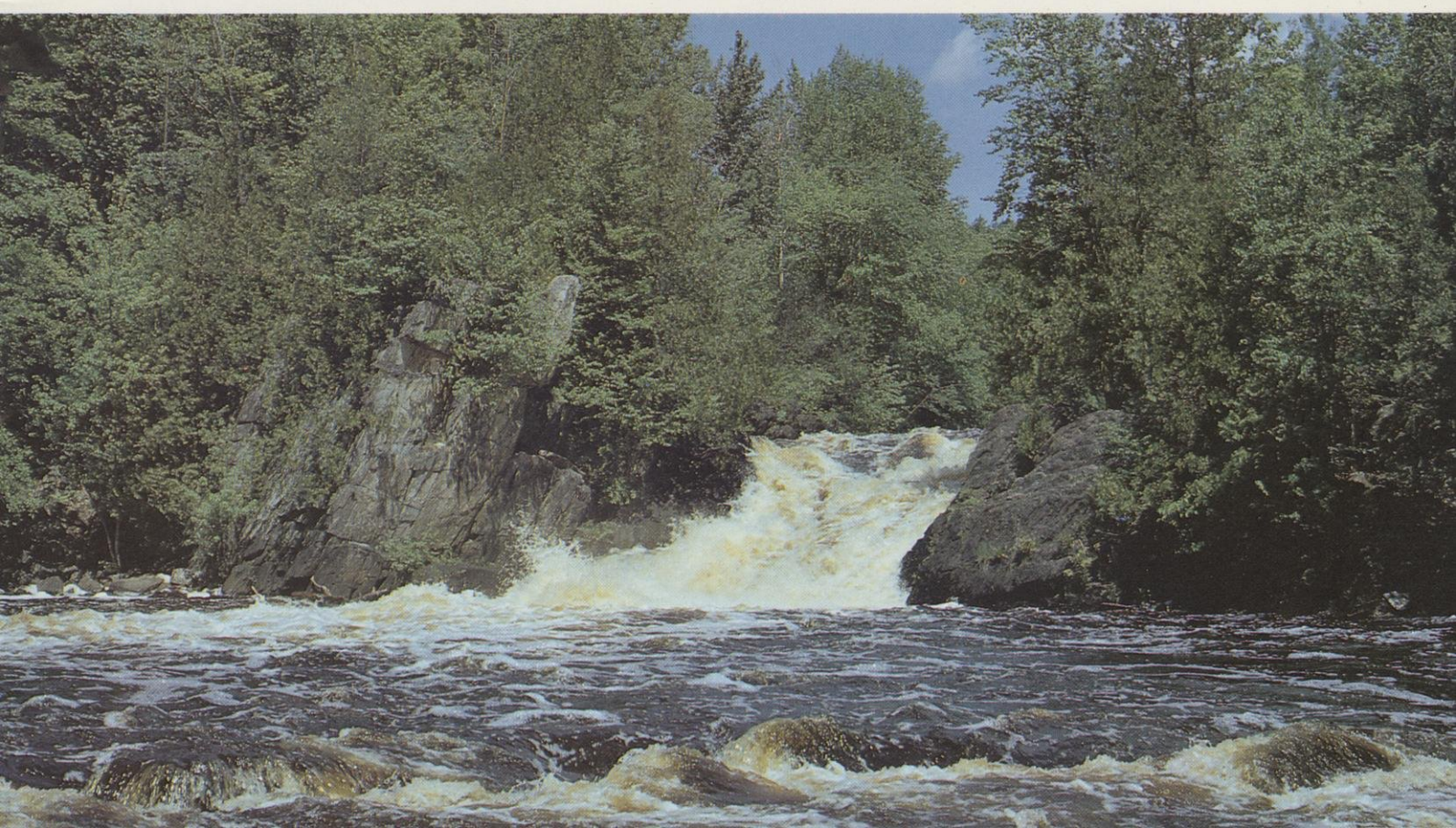
Many of Wisconsin's most spectacular falls have been put to work producing electric power and today — the community name, a few rock formations and a river may be all that remains of some wild cataract. On the Wisconsin River at Wausau, even the old name has disappeared (Big Bull Falls) . Some inkling of what a thrilling sight parts of "the nation's hardest working river" must once have been, can be had by looking at the wild waters of the Wolf River on the Menominee Reservation where the Dalles and such falls as Sullivan, Smokey, Big Eddy and Keshena thankfully, are still preserved.

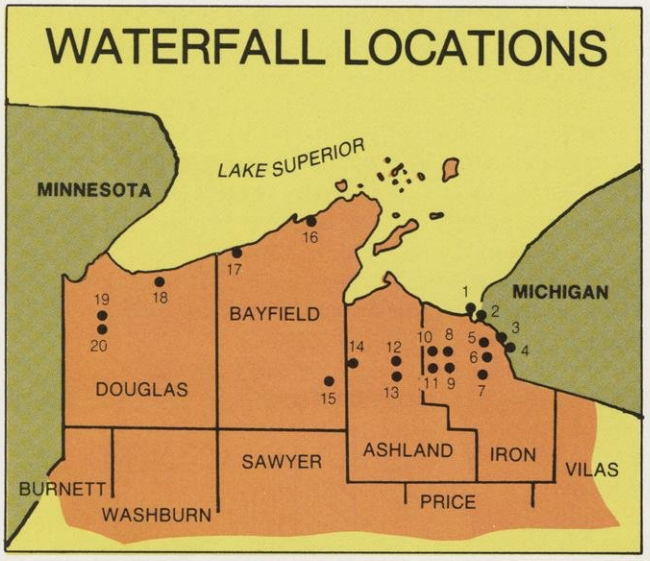
The list of waterfalls with this article is by no means complete, but tries to show the most spectacular and charming.

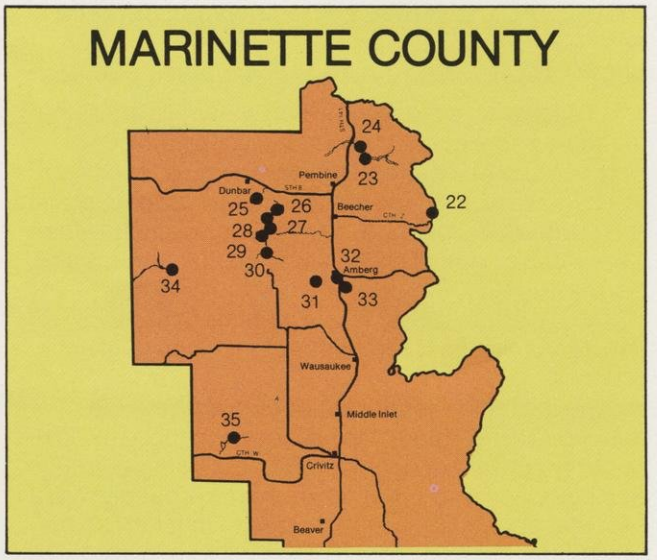
County and State Parks usually provide public access, although private property borders a few. Whether public or private, access may sometimes be difficult across rough terrain so take care. It'll be more than worth the effort.

Wisconsin's Largest Falls

Name	Height	Location
Big Manitou	165′	Black River—Douglas County
Power Dam	100′	Montreal River—Iron County
Morgan	80-100′	Morgan Creek—Ashland County
Saxon	78′	Montreal River—Iron County
Unnamed	60′	Marengo River—Bayfield County
Superior	50′	Montreal River—Iron County
Gile	40′	Montreal River—Iron County
Copper	40′	Bad River—Ashland County
Brownstone	30′	Tyler Forks River—Ashland County







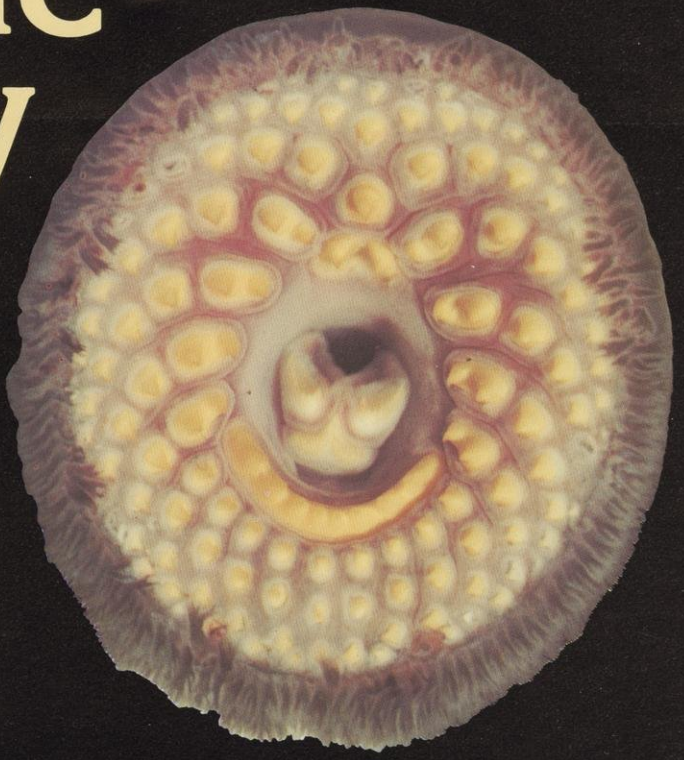
The State's Northern Waterfalls

Falls	River or Stream	Access
IRON COUNTY		
1. Superior	Montreal	STH 122—Michigan side
2. Power Dam	Montreal	Town road below Saxon Falls
3. Peterson	Montreal	Town road, 1 mile north of Hurley
4. Saxon	Montreal	Near head of Montreal River
5. Rock Cut	Montreal-west fork	Town park access, 2-1/2 miles west of Hurley
6. Gile	Montreal-west fork	Gile Village access
7. Spring Camp	Montreal-west fork	Unimproved road off Island Lake Road
8. Foster	Potato	County forest access road
9. Upson	Potato	Upson Village park access
10. Potato River (Gurney)	Potato	County forest access road
11. Wren	Tyler Forks	Walk in over county forest land
ASHLAND COUNTY		
12. Brownstone	Tyler Forks	Copper Falls State Park
13. Copper	Bad	Copper Falls State Park
14. Morgan	Unnamed tributary to Morgan Creek	Chequamegon National Forest access road
BAYFIELD COUNTY		
15. Unnamed	Marengo	Private—walk in
16. Siskiwit	Siskiwit	Town road 1/2 mile east of Cornucopia
17. Orienta	Iron	Orienta Dam
DOUGLAS COUNTY		
18. Amnicon	Amnicon	Amnicon State Park
19. Big Manitou	Black	Pattison State Park
20. Little Manitou	Black	Pattison State Park
FLORENCE COUNTY		
21. LaSalle	Pine	Walk in on marked trail from end of left fork of Hall's Creek Road, 2 miles west of intersection of CTH "C" and "U".
MARINETTE COUNTY		
22. Pemene	Pemebonwon	CTH "Z" over bridge on Michigan side - near boat landing
23. Long Slide	Pemebonwon	County scenic lookout drive on Timm's Lake Road east of STH 141
24. Smalley	Pemebonwon	Unmarked trail, 1/2 mile from Long Slide
25. Three Foot	Pike	STH 8 east of Dunbar to CTH "A"
26. Bull	Pike	Walk along stream path, 3/4 mile upstream from Eighteen Foot Falls
27. Eighteen Foot	Pike	Logging road along creek north of Twelve Foot Falls
28. Twelve Foot	Pike	Twelve Foot Falls County Park
29. Eight Foot	Pike	Path from Twelve Foot Falls
30. Horseshoe	Pike-south branch	Gravel fire lane 1/2 mile off Twelve Foot Falls road
31. Big South	Pike-south branch	Shoreline recently purchased by DNR - 2 miles west of Amberg on Dow-Dam Road, turn south to end of town road, falls is 1/4 mile east
32. Dave's	Pike	Dave's Falls County Park near Amberg
33. Bull	Pike	Walk in on powerline right-of-way off CTH "K", downstream from Dave's Falls
34. Strong	Peshtigo	Goodman Park
35. Veteran's	Thunder	Veteran's Memorial Park south off CTH "W" on Parkway Road
BARRON COUNTY		
36. Signe	Tributary to Rock Creek	Gundy's Canyon near Horsman - private
EAU CLAIRE COUNTY		
37. Hamilton	Eau Claire-north fork	Northeast Eau Claire County CTH "H", outside of town of Wilson
38. Big Falls	Eau Claire	CTH "K", north of Fall Creek
MENOMINEE INDIAN RESERVATION		
39. Sullivan	Wolf	Town road off STH 55
40. Keshena	Wolf	Town road off STH 55
41. The Dalles	Wolf	Town road off STH 55
42. Big Smokey	Wolf	Town road off STH 55
43. Peavy	Wolf	Near STH 47
44. Rainbow	Wolf	Near STH 47
45. Bear Trap	Wolf	Follow sign near Keshena Falls

BIG MANITOU FALLS at Pattison State Park on the Black River. Located on the Superior Escarpment in Douglas County, its 165 foot drop makes it the highest falls in Wisconsin.

Exotic aquatics: better safe than sorry

Exotic means "foreign" or "strange." When an outsider comes into the aquatic system, it can be good or bad. When bad, it is costly and troublesome and will continue to be so until time finally incorporates the newcomer into the ecosystem. It won't happen overnight.



Lamprey mouth parts attach to prey and suck blood.

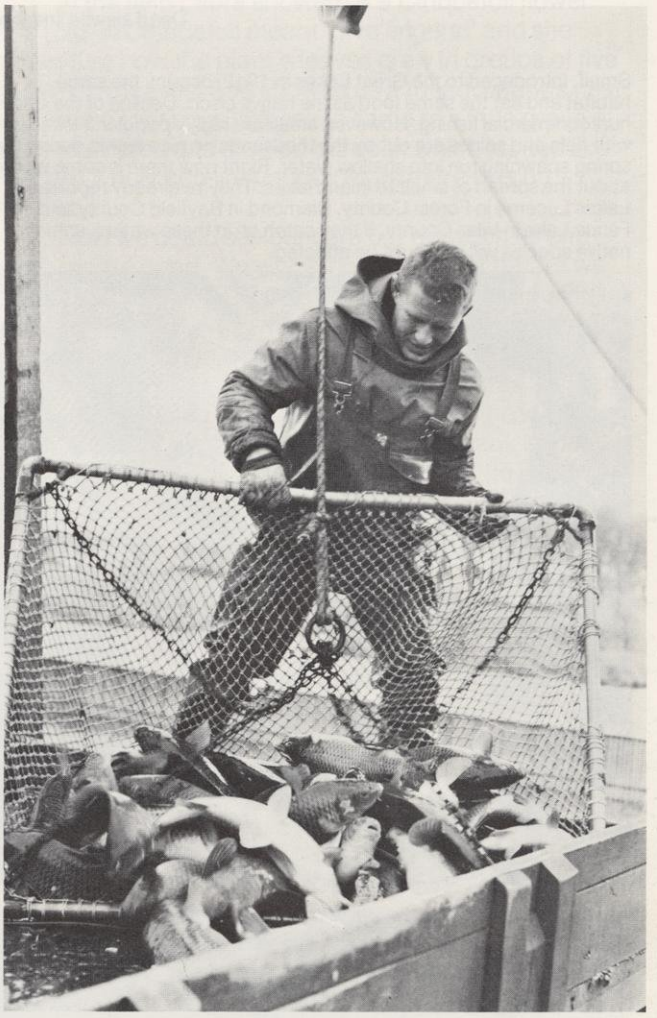
C. W. Threinen, Deputy Director, Fish Management Bureau

Bedrock of any healthy aquatic ecosystem is the balance between communities of food producers and consumers. But when man attempts to "improve" an ecosystem by introducing an alien species — an "exotic" — this delicate balance is jeopardized. Some exotics have been beneficial, some not. Introduction of the brown trout in 1883 gave us a new game fish. But for each beneficial exotic, several less successful examples can be cited. Wisconsin exotics such as carp, alewife, lamprey and smelt thrive only at the expense of the natives.

State law, therefore, is designed to prevent introduction of any more bad ones. Adherence to it can make or break an aquatic ecosystem. This is especially true when such species as grass carp and Israeli carp are being talked about for aquatic plant control. If we have learned anything from past experience it is that new species are dangerous and super-caution is the line to take. We'll keep saying "no" until all of the facts are in, then evaluate. Better safe than sorry!

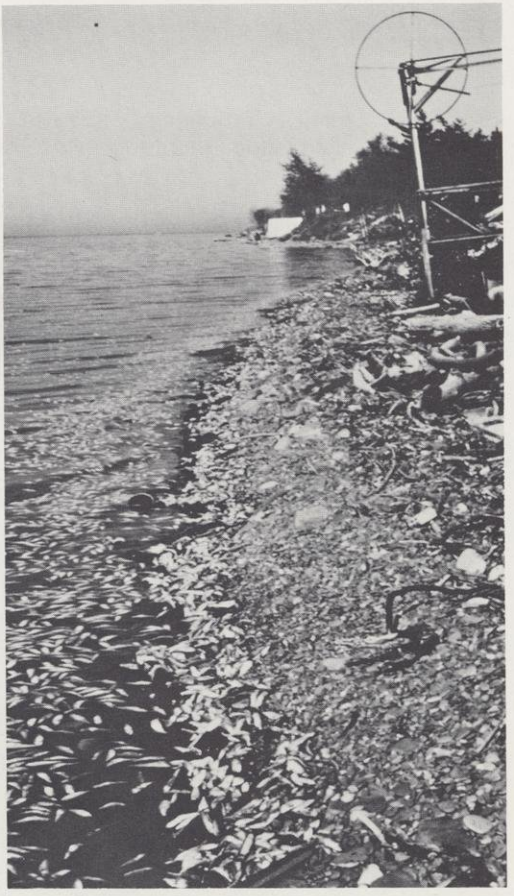
The lamprey, probably the most detrimental exotic, is responsible for decimating lake trout populations. First noticed in Lake Michigan in 1936 and in Lake Superior in 1946, the lamprey got into the Great Lakes through the manmade canal system from the Atlantic Ocean. More than $3 million is spent nationally each year to combat this exotic. Without such a control program, no trout or salmon could survive in the Great Lakes.

A species of crayfish *(Orconectes rusticus)* is a recent invader, probably introduced by fishermen who used it as bait. Large populations could deplete aquatic vegetation that serves as a nursery for young fish and a browsing ground for others. Effect of this change in habitat would be to favor an open water species like the walleye over those associated with vegetation such as bluegill and bass. One method of combating these invaders is to encourage increased harvests. Despite their threat to the ecosystem, they make a tasty dish.

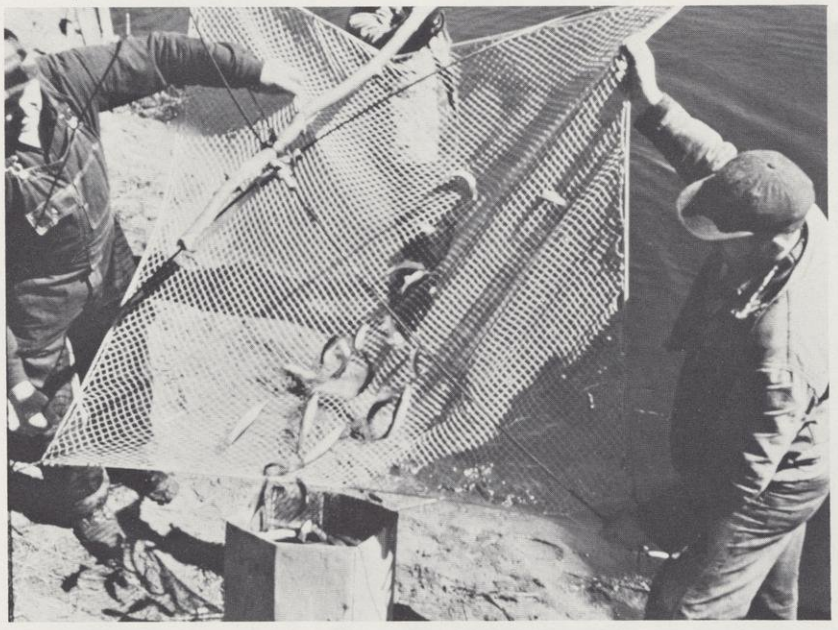


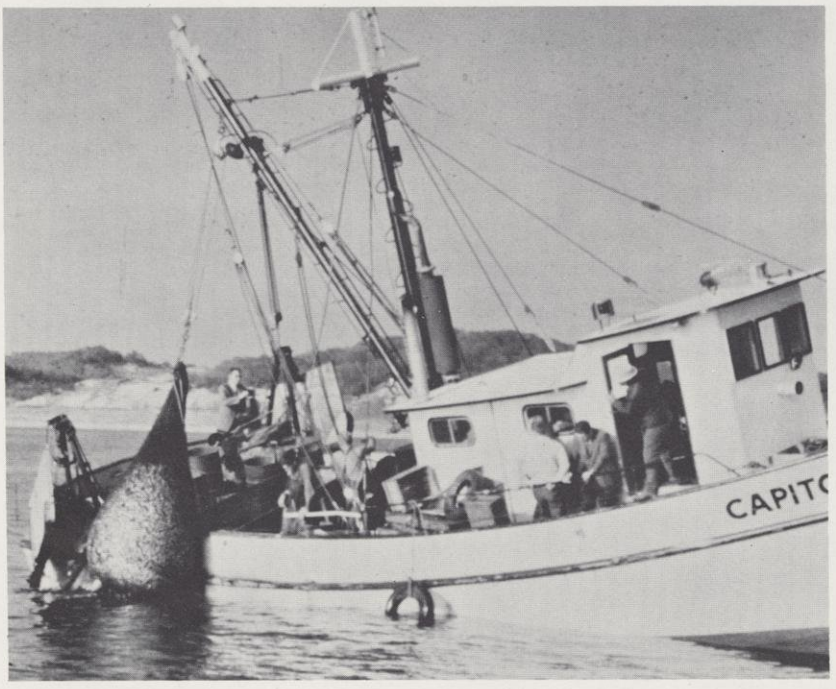
Carp were first introduced in 1879 as an additional food resource. Voracious eaters, carp overbrowse the bottom fauna and plankton in shallow waters. Turbidity and limited game fish populations result. They are controlled by commercial fishermen, state crews, and fish toxicants. (For some good recipes see page *26*) . Whether to get rid of carp is a dilemma for today's recreation minded public. Without them fertile waters grow weeds that support good fish populations, but weeds inhibit boating. Some localities that got rid of the carp wished they hadn't.

Dead alewife line the lake Michigan shore.



Smelt, introduced to the Great Lakes in 1912, occupy the same habitat and eat the same food as the native cisco. Decline of the cisco hurt commercial fishing. However, smelt are highly popular. Fishermen with nets and seines are out by the thousands on nice nights during the spring spawning run into shallow water. Right now there is some worry about the spread of smelt to inland lakes. They're already reported in Lakes Lucerne in Forest County, Diamond in Bayfield County and Fence Lake in Vilas County. If they catch on in these waters, some native species will no doubt be affected.





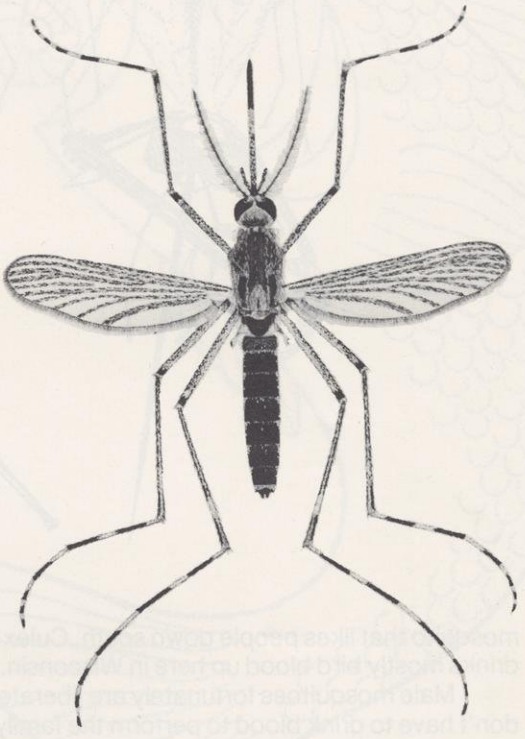
A Lake Michigan trawler takes on a load of alewife. Like lamprey, these fish entered the Great Lakes through the canal system. First noticed in 1949, today the alewife is the most abundant fish in Lake Michigan. Unfortunately, its commercial value is far below that of the species it replaced—chubs, cisco and perch. However, alewife are excellent food for predator species. Success of the salmon and trout stocking program rests heavily on this food base.

Water milfoil (Myriophyllum *exalbescens* var, *spicatum*) . This is the most notorious exotic aquatic plant in Wisconsin. Characterized by intensive root systems and dense stands, this milfoil can weather considerable disturbance. Sometimes it takes over a whole lake. Vegetative control programs then spring up and arguments ensue about such things as chemical control vs. mowing.

Unlike milfoil, another exotic aquatic plant called curly-leaved pond weed has been present in Wisconsin waters for the past 50 years. So far it has caused no serious problems.

Photos by UW-Madison Limnology Laboratory, Dean Tvedt

Bzzz, slap, ouch, #$%#$%*



The mosquitoes they bite.
They're awful tonight.
But you smell just like citronella.

(From a popular song of the 1920's.)

J. WOLFRED TAYLOR, Editor, Wisconsin Natural Resources

It is dark. You want to sleep, but above the bed a faint high pitched tone irritates, Bzzz. . . Kojak's police siren is silence compared to this. It stops. You know a teensy female dracula is somewhere on you, sipping. You don't know where because she weighs only 1/25,000th of an ounce.

Your corpuscles are passing through a Lilliputian tube that is part of an intricate piece of evolutionary equipment known as a labium. The labium is a kind of sheath. It covers two pairs of miniscule knives that pierce about 1/10th of an inch into your skin. It also covers two tubes, one for squirting in a little saliva that may contain an anticoagulant and the other for sipping out the blood. You hope the mosquito gets some of your cholesterol with it.

About 90 seconds later you begin to itch. Now you know where. The swelling is caused by your allergic reaction to the saliva.

Outdoors in the backyard or in the northwoods, the ritual is the same: BZZZ, OUCH, SLAP, #$%#$% Diabolical!

Of the 2,500 species of mosquitoes in the world, Wisconsin is fortunate to have only about 50. You might be a target of opportunity at any time for all except about 10 of the 50. But chances are pretty good that when you're bitten in Wisconsin, it will be by any one of an elite and vicious group of about eight super-people-eaters. None of the eight is a primary vector of any disease. Most are from the genus "Aedes", a Greek word which means "nauseous" or "distasteful."

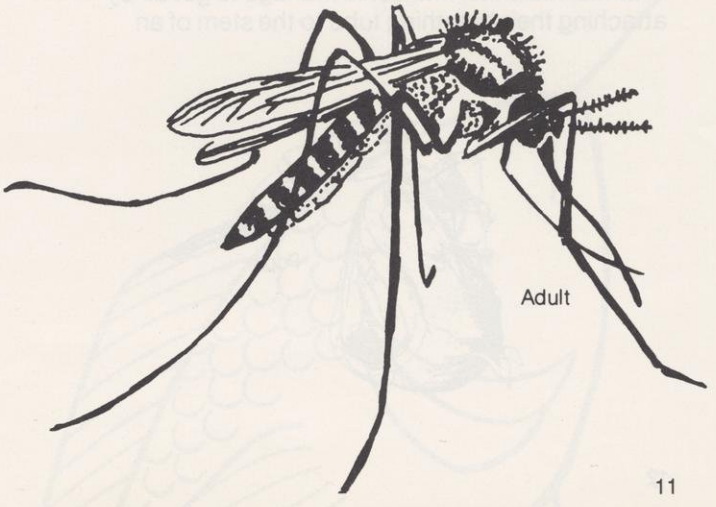
Among the species names are *vexans, excrucians, stimulans, intrudens,* and *punctor.* to mention a few. Putting down the mosquito appears to be universal, even in the name. No doubt they deserve it.

BZZZ, OUCH, SLAP, #$%#$%

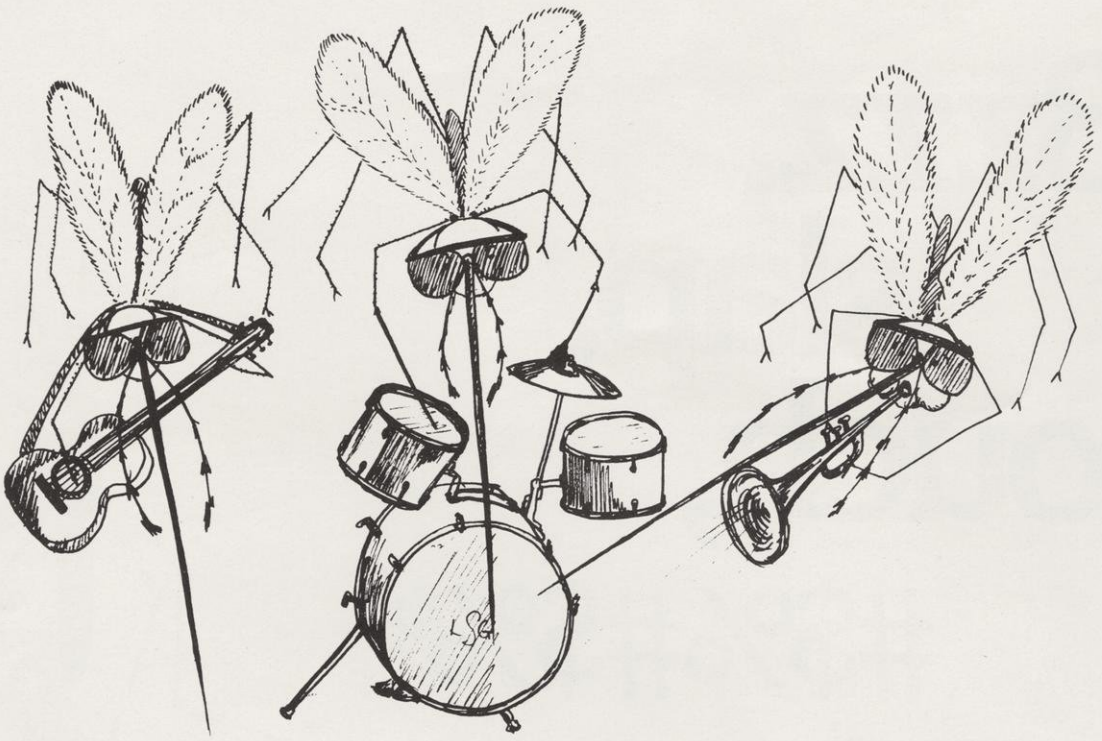
As you know, with mosquitoes the female of the species is more deadly than the male. She needs a blood meal to ripen her eggs and yours or some other critter's have to be there for the biological fulfillment.

When she lifts off from behind your ear, as much as five milligrams of your blood may go with her. This suffices for anywhere from 75 to 500 eggs. She may go through as many as 10 egg laying cycles before giving up the ghost and each cycle needs a shot of blood. By then you need a donor card.

Don't get a swelled head (or feel persecuted) about being everylady's target, though. One Wisconsin species prefers turtles and terrapins to people and many are specific to cold-blooded animals. A common



Adult

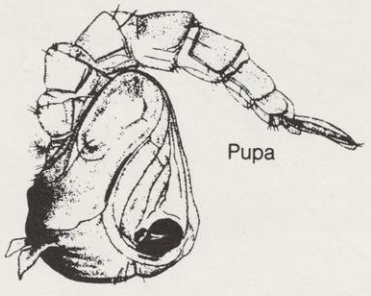


mosquito that likes people down south, Culex *pipiens,* drinks mostly bird blood up here in Wisconsin.

Male mosquitoes fortunately are liberated. They don't have to drink blood to perform the family function and content themselves feeding only on nectar and other plant juices—the principal food of the female too when she's not trying to make babies.

Some male mosquitoes find their mate by homing in on the tone of that buzz you heard in bed. Her wings beat anywhere from 250 to 500 times per second and emit a note so constant that even an appropriate tuning fork can be a siren song. In fact, mosquitoes have been known to fall in love with the hum of an electric motor. Though much mating behavior is ingenious, some is pretty basic. In many Wisconsin species, males simply swarm in large numbers over a specific visual marker on the landscape such as a light colored spot over a pool. A kind of skeeter orgy ensues as the females fly through.

The primary pest species in the southern two-thirds of Wisconsin is Aedes *vexans.* Up north, you're most likely to be nailed by another genus, Mansonia *perturbans.* Aedes larvae grow up in temporary pools of water while the larval Mansonia live in cattail marshes. Mansonia manage to get air by attaching their breathing tube to the stem of an underwater plant. Aedes and most other kinds have to hang from the surface to breathe.



Pupa

Main food of the mosquito larva is algae, bacteria and minute animals called infusoria. These are swept into the mouth by two hairy brushes that sift out and release unsuitable material in the form of little balls that drop to the bottom. A single larva can filter two quarts of water or more in one day.

Some mosquitoes can develop only in a specific habitat: slowly flowing streams or fast ones, streams with vegetation or those without, polluted water, clean water, temporary pools, in sunlight or in shade. Many larva will live only in water held in the rotholes of trees. In Wisconsin a tree hole breeder called Aedes *triseriatus* is known to be a vector of the La Crosse strain of California encephalitis in humans. Other Wisconsin mosquitoes transmit other encephalitis and dog heartworm.

Eggs of most Aedes are deposited on dry or moist ground. When it floods they hatch. Other mosquitoes lay eggs directly on the water. A single female may lay anywhere from 40 to 300 eggs, and depending on the species, eggs may be deposited singly or stuck together like little rafts. Some are boat shaped and have floats.

Production is prodigious. So is predation. One pool of water near Rhinelander that measured about 45 by 20 feet hatched 4½-million Aedes *vexans* in a single generation. Various species can produce a generation every two or three weeks if rains come at the right time. In some localities, a pool of water can be black with larva.

Despite such fecundity, Mrs. Mosquito is lucky if even two of her female offspring survive to reproduce. Besides your slap, they succumb to such natural enemies as fungi, worms, birds, dragonflies, wasps, fish, amphibians, water beetles and other mosquito larva.

If it's any consolation (and it should be) mosquito longevity reflects these hazards. They live 100 days or

more in a laboratory, but in the wild it's less than a month and could be as little as two weeks, depending on species. The warmer the weather, the faster the pace and the quicker they die.

Some species get through the winter as eggs, others as hibernating adults, still others as larvae. Eggs deposited on dry ground may last more than one year until the right water conditions occur for hatching. One mosquito found in Wisconsin has a symbiotic relationship with the pitcher plant. It lives inside the tubular leaves, feeding on mutual victims, then overwinters there, frozen solid in a block of ice.

As to how she finds you for the bite, it's a matter of life and breath, random but adequate. First, special sensors detect your respiratory carbon dioxide. Then heat and moisture from your body help her zero in. Mosquitoes bite most at dusk on hot days because they're fragile and dry out easily in the full sun.

Repellants either block the sensors so the mosquito doesn't know you're there or else emit some concoction that's downright unpleasant to a bug. Repellants work best in an enclosed place.

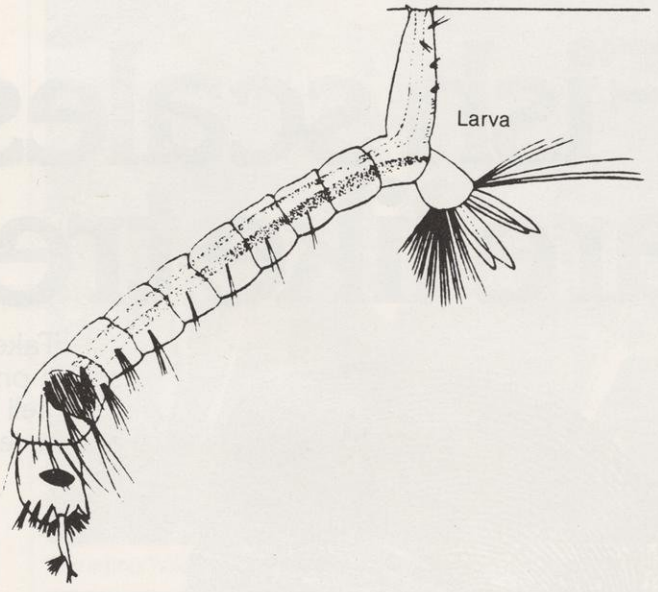
In the olden days, a celebrated favorite repellant was citronella, made from a fragrant grass that grows in southern Asia. As a matter of fact, a Conservation Bulletin article published in September, 1941, entitled "Bug Bites" recommended this mixture:

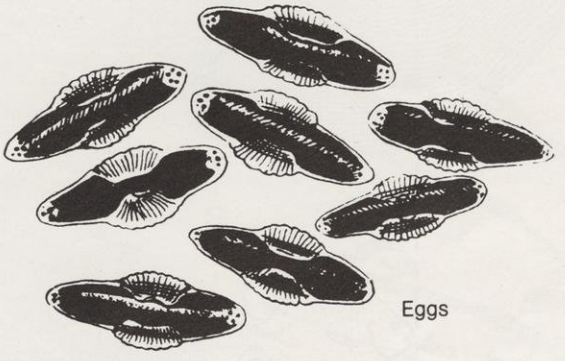
One ounce oil of citronella
One ounce spirts of camphor
One-half ounce oil of cedar.

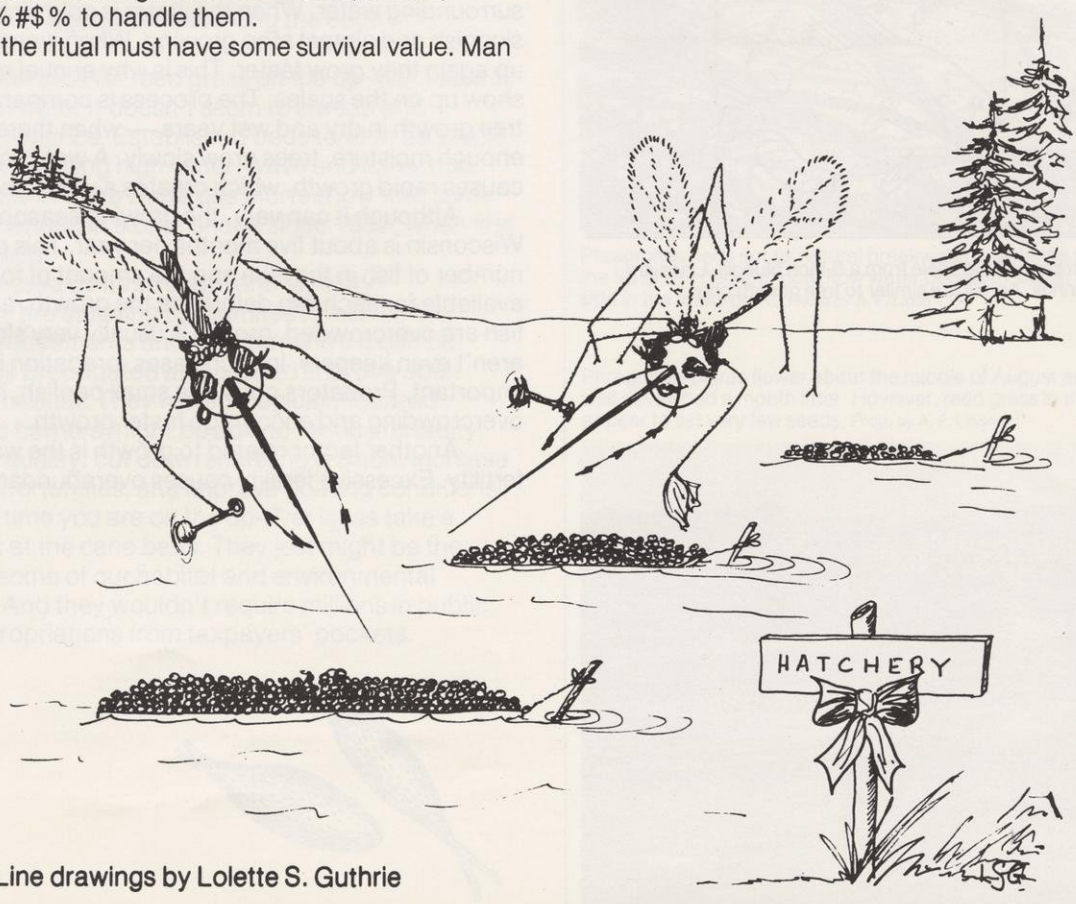
Today such chemicals as DEET (N-N Diethyl Toulamide) are used in sprays or liquids.

Come citronella or DEET though, mosquitoes will probably be showing up at your picnic forever. After all, they've been around about 50-million years so far—long enough so that by now you'd think man would have evolved something better than BZZZ, OUCH, SLAP, #$%#$% to handle them.

Well, the ritual must have some survival value. Man is still here.



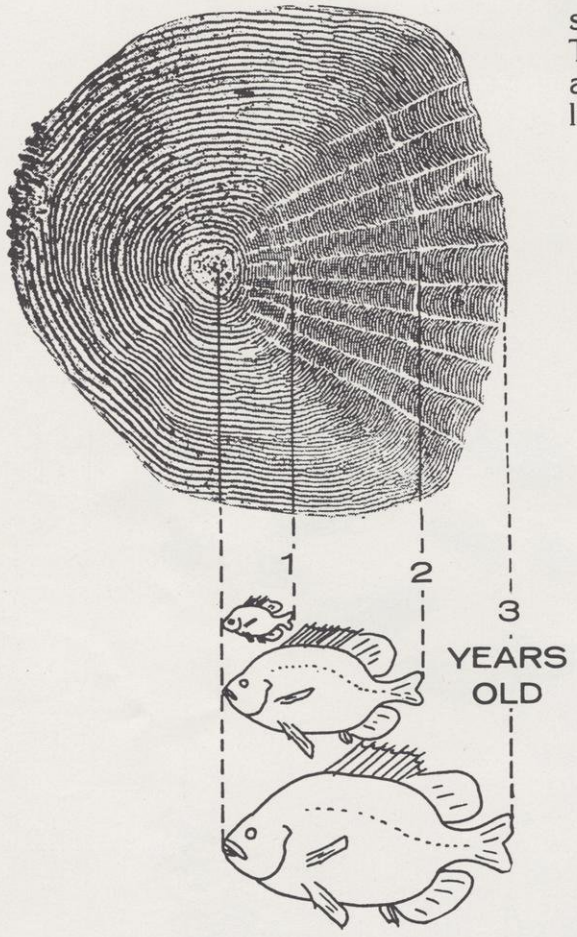




Line drawings by Lolette S. Guthrie

Fish scales are like tree rings

Take a close look at the scales on those fish you catch. They tell how fast the fish grew and its length for each year of life.



An enlarged illustration of the scale from a 6-inch bluegill. Lines are drawn from the annuli. Annuli are similar to tree growth rings.

HOWARD E. SNOW, DNR Warmwater Fish Biologist, Spooner

Did you know that a fish scale grows in proportion to the length of the fish? The annual marks on the scales, called annuli, are similar to growth rings on trees. They'll tell you the fish's age when caught, its growth rate and what size it was in previous years.

Suppose you catch a 6-inch bluegill. A scale tells you it's three years old. The first annuli would be 25 % of the length from the center to the edge of the scale, or .25 x 6 = 1.5 inches long in the first year. The second annuli is 70 % of the length which means the fish was 4.2 inches long by the second year. Notice that the bluegills's growth during the second year is much greater than growth during the first and third years. This means growth conditions were more favorable then.

Variations in growth among fish populations is dependent upon several factors. Fish are cold-blooded — their body temperature is only slightly higher than the surrounding water. When the water is cold, fish are sluggish and almost stop growing. When water warms up again they grow faster. This is why annual marks show up on the scales. The process is comparable to tree growth in dry and wet years — when there isn't enough moisture, trees grow slowly. A wet year then causes rapid growth, which creates a wider annual ring.

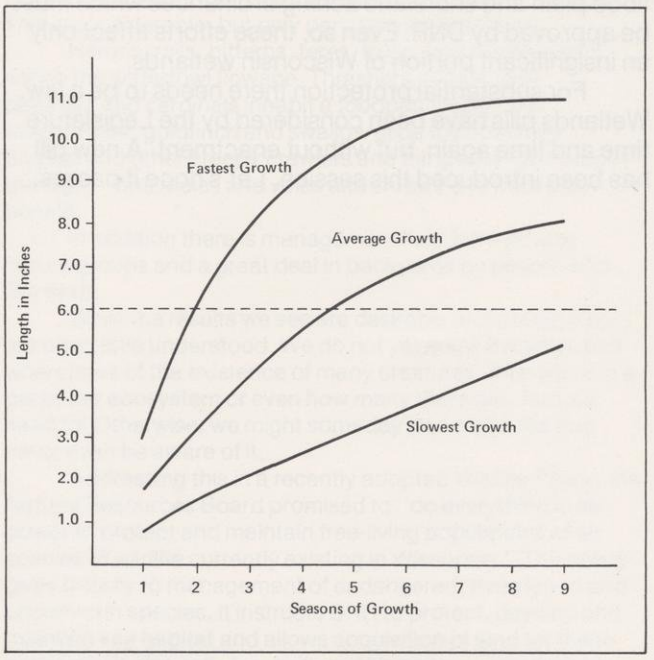
Although it can vary, the growing season for fish in Wisconsin is about five months per year. This plus the number of fish in the lake and the amount of food available for each fish determine the growth rate. When fish are overcrowded, growth is usually very slow. Most aren't even keepers. In such cases, predation is very important. Predators consume small panfish, help ease overcrowding and encourage faster growth.

Another factor related to growth is the water fertility. Excessive fertility causes overabundant

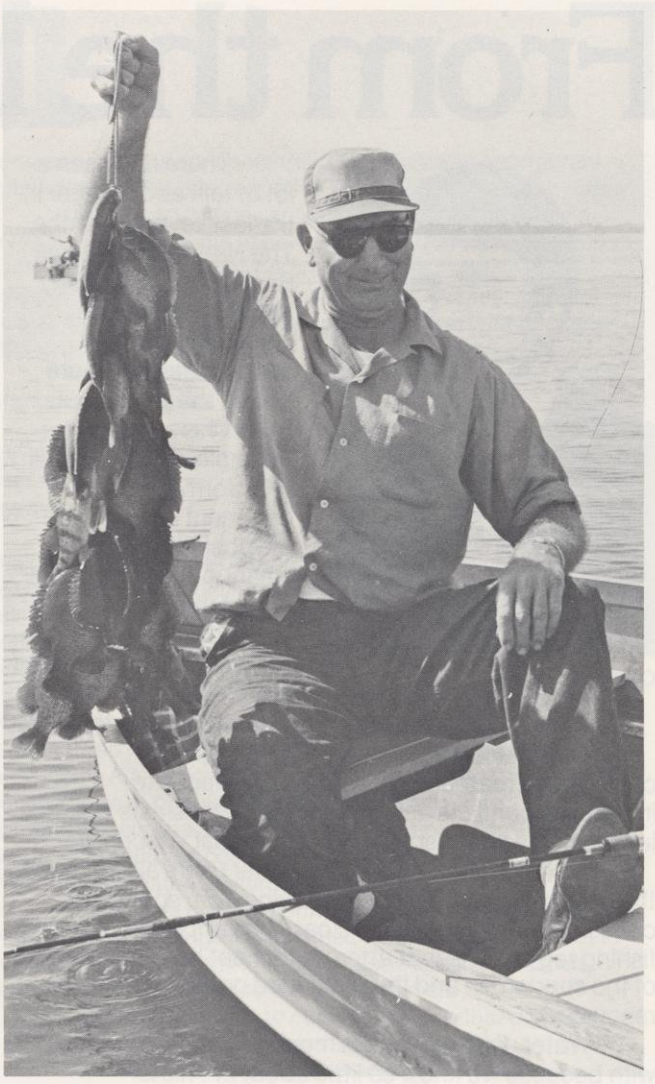
vegetation which limits predation on small forage fish and causes overcrowding.

On the average, a bluegill in northern Wisconsin reaches a length of six inches by its fifth year of life. However, a 6-inch bluegill could be as young as two years or older than nine, depending on growing conditions. Both the fastest and slowest growth rates shown are for northern Wisconsin. Analysis of data from southern Wisconsin, however, indicates that this is a close approximation of maximum and minimum growth for the entire state.

Age and growth information is not obtained just to satisfy curiosity. It is an important part of determining the status or well-being of a fish population and is necessary for wise management of our waters.



Fastest, slowest and average growth rates of bluegills from 44 northern Wisconsin lakes.



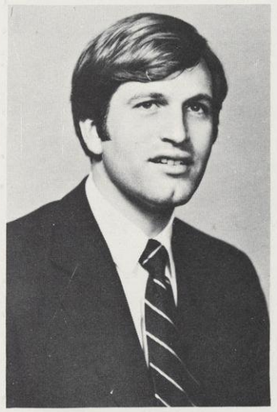
How Old is Your Fish?

SPECIES	AVERAGE LENGTH (INCHES)*									
If Bluegill is	1.7	3.3	4.4	5.5	6.3	6.9	7.6	7.8	8.1	9.3
If Perch is	2.8	4.3	5.7	7.2	7.9	9.0	9.6	10.3	—	—
If Pumpkinseed is	2.2	3.2	4.5	5.3	6.0	6.2	6.8	7.1	—	—
If Rockbass is	2.2	3.6	5.0	5.6	6.8	7.7	8.4	9.7	10.3	—
If Crappie is	2.8	4.8	6.7	8.0	9.1	9.6	10.1	10.7	10.7	—
If Northern Pike is **	9.6	14.2	16.5	18.9	21.7	23.8	26.2	25.2	30.0	—
If Largemouth Bass is **	3.8	7.2	9.6	12.1	13.3	15.3	16.5	17.6	18.2	19.7
If Walleye Pike is **	5.6	10.2	12.8	14.7	17.0	17.9	18.8	20.5	22.1	—
	THEN ITS AGE IS ABOUT (YEARS)									
	1	2	3	4	5	6	7	8	9	10

* Based on average lengths at the end of each growing season in northern Wisconsin.

** Check for legal size limits.

From the board



Chairman Thomas P. Fox

There has been a lot of talk about water in the last several months. The Natural Resources Board has spent many hours on water and water use and we'll spend hundreds more before the year is out.

This summer, for example, the Board will seek formal public comment on our proposals for further cleanup of the Fox River, one of the most heavily industrialized streams in the world. Comments on the Wisconsin River cleanup will come later.

This year and next, we'll watch a special committee created to recommend solutions to increasing conflicts among outdoor enthusiasts who use lakes and rivers—especially in southeast Wisconsin.

Traditional regulations for water users also occupy the board. With benefit of the advice from spring conservation hearings, the Board has approved annual fishing regulations that attempt to meet both the needs of the sportsmen and the continued good health of the resource.

Water under ground is more perplexing to deal with because we know so little about it. This is something both the Board and Legislature are concerned about.

One thing we do know is that wetlands are critically important to surface and groundwater. But, even though we know, not much is being done about it in Wisconsin.

Wetlands offer habitat for thousands of diverse plants and animals and serve as giant filtration plants, straining out sediment and nutrients before they reach lakes and streams.

Wetlands also serve as groundwater recharge areas, insuring that water drawn from underground for homes, businesses and industries is replenished and the resource restored.

The Board is working to preserve those wetlands for which it has responsibility—those on state lands where our control is direct and those included in local flood plain and shoreland zoning ordinances which must be approved by DNR. Even so, these efforts affect only an insignificant portion of Wisconsin wetlands.

For substantial protection there needs to be a law. Wetlands bills have been considered by the Legislature time and time again, but without enactment. A new bill has been introduced this session. Let's hope it passes.

Editorial

Let's hear it for the voles and moles and mice and frogs and things that go bump in the night! There's a bill in Washington that will help them.

Game species of wildlife have always received plenty of attention. It's a good thing too! Willing sportsmen buy licenses and contribute money and work to counteract vagaries of land and water economics that threaten the habitat of trophies. Because they do, musky, trout, deer, pheasant, geese, ducks, ruffed grouse and the rest of the game species remain plentiful.

Other species, however, without a million dollar survival kitty, live on only because of a sort of symbiotic management benefit derived from fish, game, parks and similar programs. This is considerable, but only peripherally intentional.

Herons, rails, bitterns, terns, frogs, and marsh wrens enrich the waterfowl flowage. Thrashers, robins, jays, peewees and cardinals inhabit a foodpatch edge and meadowlark, goldfinch and swallow glide the openings. Snakes and other creepy crawlers and things that go bump in the night—the moles and voles and shrews and mice also benefit.

In addition there is management help from private nature groups and a great deal in backyards by people who like birds.

While the results we see are desirable and pretty, they are often little understood. We do not yet know the whys and wherefores of the existence of many creatures, their place in a particular ecosystem or even how many there are. And we need to! Otherwise, we might someday lose a species and never even be aware of it.

Addressing this in a recently adopted Wildlife Policy, the Natural Resources Board promised to "do everything in its power to protect and maintain free-living populations of all species of wildlife currently existing in Wisconsin." The policy gives priority to management of endangered, threatened and uncommon species. It instructs DNR to protect, develop and maintain key habitat and allows acquisition of land for these purposes. It also calls for studies of life history, populations, census methods, pesticides and the effects of land use and other environmental changes on non-game species.

All this costs money and the policy pledges a search for new funding. At present, the budget for these purposes is frankly minimal: $23,000 per year spent on such things as population surveys of fish, loons, upland sandpipers, sandhill cranes and frogs; for construction of osprey and cormorant platforms and for reintroduction of the pine marten and turkey.

By contrast, money actually needed, according to a recent query, amounts to between $200,000 and $240,000 annually. Eagles, hawks, herons, loons, terns, turkeys, shorebirds, flying squirrels, weasels, bats, snakes, turtles, frogs, fish, molluscs and other species all need work not now being done.

The big hangup is a source of funds that won't penalize some other program!

Voluntary contributions, tried by many state agencies, produce only token amounts. In Wisconsin the Wildlife Society has launched a "Living Resources" program it hopes will do better.

In Washington, Congress has been nibbling at a way to help and here lies the best hope. Last session a proposal for excise taxes on binoculars, cameras, tents, backpacks and similar outdoor equipment looked like it might go. But it turned out to be too diverse and also failed to get backing from the industries involved.

This time there's a better chance. Colorado Senator Gary Hart has a bill to authorize graduated appropriations over a three year period of $20, $30 and $40-million for non-game management. It would be distributed among states on the basis of population and area and pay up to 75% of program costs on a matching basis. No more than 10% of a state's contribution could come from hunting and fishing fees. Wisconsin Senator Gaylord Nelson is a co-sponsor.

The Senate Environmental and Public Works Committee will schedule hearings this summer. Passage could do a lot to assure survival of many little understood species and their ecosystems here in Wisconsin and elsewhere.

For those who wish to communicate further on this (Senate Bill 1140), the address is:

Senator Jennings Randolph
Chairman, Environment and Public Works Committee
Room 4200
Dirksen Senate Office Building
Washington, D. C. 20510

So, altogether now, let's hear it for the creepy crawlers and voles and moles and mice and things! After all, who'd want to live in a world with bumpless nights?

J. Wolfred Taylor

The readers write

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 editor" should be addressed to Wisconsin Natural Resources magazine, Box 7921, Madison, Wisconsin 53707.

Readers can get birds and butterflies in lots of magazines—the Wisconsin Natural Resources magazine is in a unique situation to explain a very controversial issue (Horicon geese management). Maybe it's "ripe" time for the state-federal umbilical to be severed. **RON DANIELSON, Milwaukee.**

You bunch of dummies. Here's how to clean up your lakes. Clean up the creeks and rivers flowing in. Forget about checking licenses. Put a stiff fine on polluters and arrest them. **B. J. DONN, Madison.**

The Wisconsin Society of Biological Scientists would like to comment on "Fire Season 1976" in the March-April issue. Uncontrolled blazes that threaten human life or property must be stamped out, but it should be recognized that most marsh and woodland fires do little or no permanent harm to the wild environment. Instead, they bring a chance for certain native plants and animals to reinvade the burns. The DNR should point out that fires can sometimes be used for the health of a diverse environment. **JOHN BIELEFELDT, Secretary-Treasurer, Waukesha.**

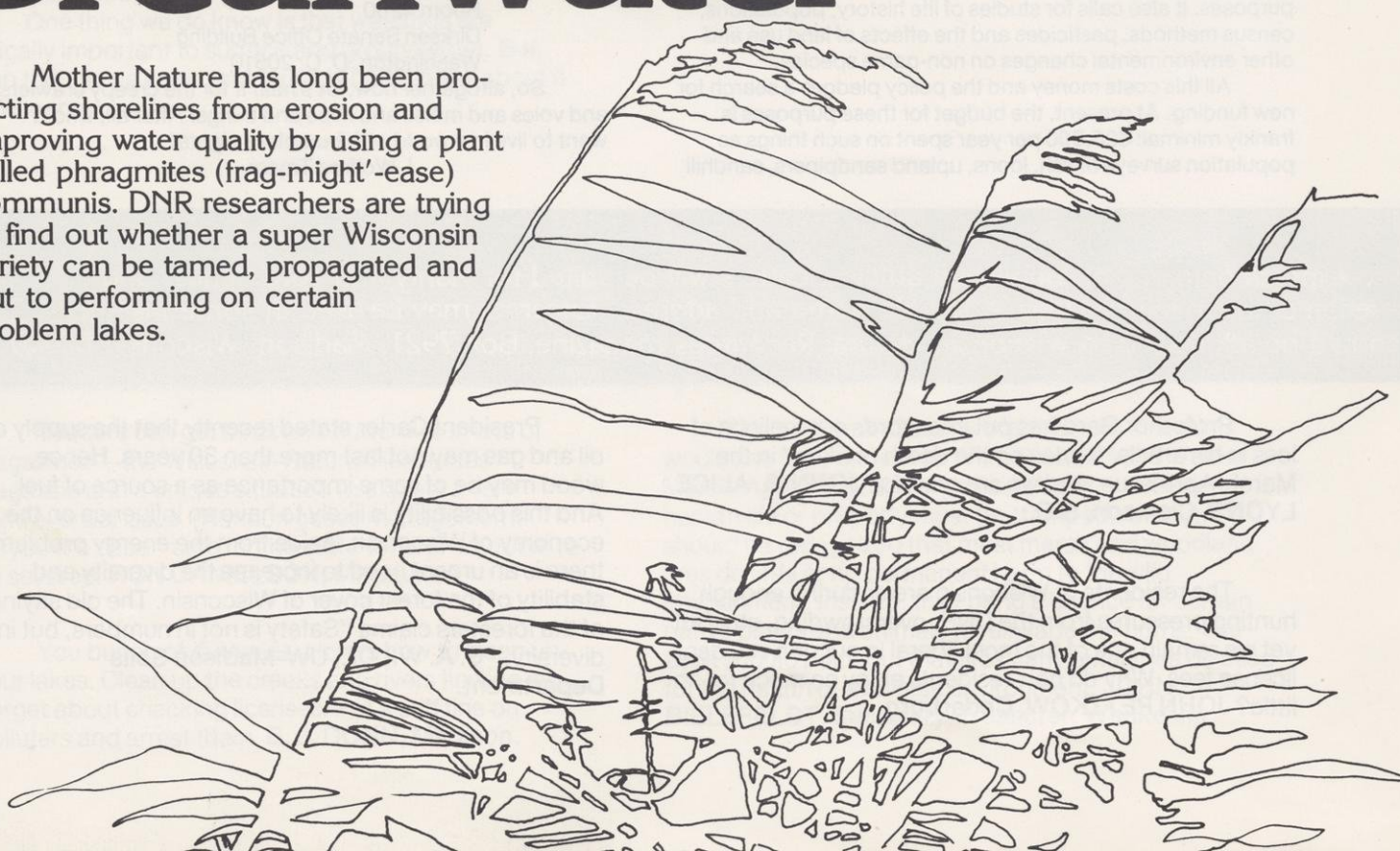
Professor Gard has put into words our feelings of loss in his article "Notes on the death of Elms" in the March-April issue, and we are grateful. **JOHN & ALICE LYONS, Clemson, S.C.**

The residents of Wisconsin are enduring enough hunting pressures from the DNR, overcrowding, etc. But yet we remain one of the most liberal in our non-resident license fees. Why do non-residents enjoy so much for so little? **JOHN PETZKOW, Cedarburg.**

President Carter stated recently that the supply of oil and gas may not last more than 30 years. Hence, wood may be of some importance as a source of fuel. And this possibility is likely to have an influence on the economy of Wisconsin. Aside from the energy problem, there is an urgent need to increase the diversity and stability of the forest cover of Wisconsin. The old saying of the foresters claims "Safety is not in numbers, but in diversity." **S. A. WILDE, UW-Madison Soils Department.**

Phragmites - a natural breakwater

Mother Nature has long been protecting shorelines from erosion and improving water quality by using a plant called phragmites (frag-might'-ease) communis. DNR researchers are trying to find out whether a super Wisconsin variety can be tamed, propagated and put to performing on certain problem lakes.



ARLYN F. LINDE, Project Leader, Oshkosh

Perhaps you don't recognize the name "Phragmites". It's not exactly a household word, although "giant reed grass" or "cane" is more recognizable, especially by East Central Wisconsin residents. Phragmites is part of a plant's scientific name—*Phragmites communis* and derived from a Greek word meaning "fence". If you live on the up-river lakes of the Wolf River—Butte des Morts, Winneconne or Poygan I'm sure you've seen it.

For waterfowl hunters cane beds serve admirably as natural blinds. Leafy tops conceal both the hunter and his boat and tough, resilient stems part easily without breaking then close again after a boat passes.

On these lakes phragmites grows in water depths of two feet or deeper—more than adequate for easily pushing a skiff. Reed grass benefits waterfowl too with good brood cover in summer and concealment for adults at other times.

Phragmites is not restricted to the up-river lakes, although it does show some peculiarities in these waters not found elsewhere. Actually the species is about as cosmopolitan as cattail and is spread throughout the world. In Britain "reed beds" are managed on wildlife areas as cover plants. Game specialists keep them at the desired density and maintain openings through periodic cutting and burning. This is often done by controlled commercial harvest because reeds are marketed as barn roof thatching. A good thatched roof can last 60 to 80 years. How many composition shingle roofs compare with this?

Phragmites is a perennial with massive, tough rootstocks which contain the stored food needed to push new shoots to the surface where they can get sunlight. The new shoots begin to grow during the first half of April and usually reach the surface by the first of May. Growth is fast. Plants in the laboratory grew one inch a day. The shoots sprout up quickly to where light intensity is great enough for photosynthesis.

Phragmites is very tall averaging about 6-1/2 feet, but heights between nine and 10 are not uncommon. The stem is hard, tough and tubular with joints or nodes

at intervals. Leaves are found along the stem above the surface of the water. Unusual for phragmites is the fact that in the up-river lakes it can tolerate deep water up to four and five feet with a usual depth of two to three feet. In most other marshes in Wisconsin, 12 inches is about all it will take. Since water levels often fluctuate upriver, this ability to survive deep flooding is a positive attribute for its continued presence.

Unlike other emergent aquatic plants which are easily torn loose when ice cover in which they are frozen lifts during spring floods, phragmites holds fast. Rootstocks are so massive and interwoven in bottom soils that the dry stems or "canes" tear off before the roots pull loose.

Phragmites seeds look like little swallow-tail boats about the size of pepper that comes out of your shaker.

Phragmites has interesting floral spikes which make attractive dry arrangements, but its importance in the up-river lakes goes well beyond exotic appearance and decorative potential.

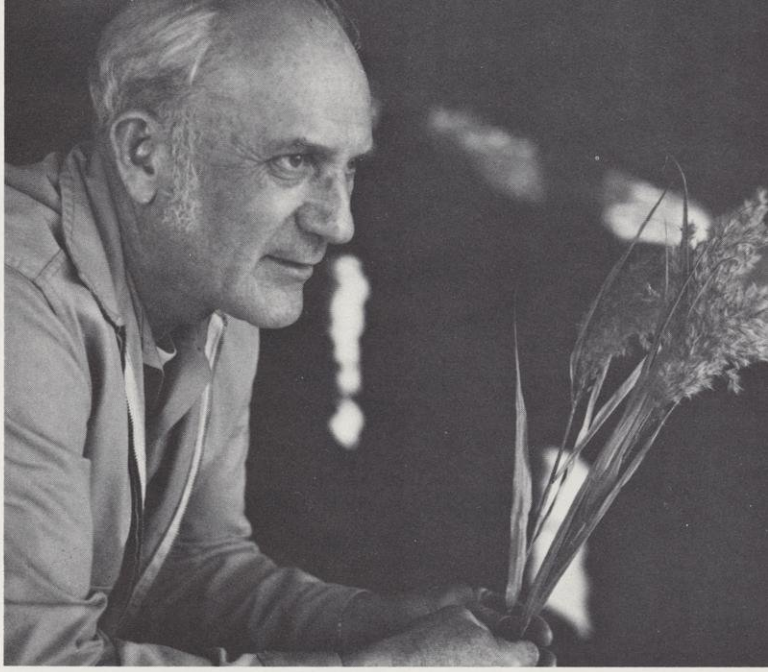
In addition to being useful as a cover plant, it has an even greater utility as a barrier to wind and wave action. Long narrow beds in off-shore locations become natural breakwaters. The white-caps may roll on the windward side of a phragmites bed, but the lee is usually almost wave free. For boats this means smoother, safer travel on windy days. It also means that much of the bottom sediment put into suspension by wave action settles out along the edge of the reeds, reducing turbidity.

Increased water clarity means better habitat for plant growth and for sight feeding fish such as northern pike. In addition to physically breaking the waves already formed, plant barriers in open water tend to reduce wind "fetch" or ability of wind to generate large waves. Both wave damper and breakwater effects, protect adjacent shorelines and reduce erosion. This helps prevent vegetation loss along the edge of marshes.

Another plus for reed grass on the up-river lakes is that in open water it doesn't seem to spread and become a nuisance. Established beds tend to be stable and strong, resisting high water, wave and ice action. Aerial photos of Lake Butte des Morts show that some have not changed in size or shape since 1937, when first photographed.

Impressed by its strength and stability, researchers are studying phragmites to learn more about its requirements and to determine if it can be successfully propagated and used to improve open water lake habitat. They feel strategically located phragmites barriers might be able to reduce turbidity, help water quality, cut down shoreline erosion, increase hunting opportunities, and improve boating conditions.

Next time you are on the up-river lakes take a closer look at the cane beds. They just might be the answer to some of our habitat and environmental problems. And they wouldn't require millions in public works appropriations from taxpayers' pockets.



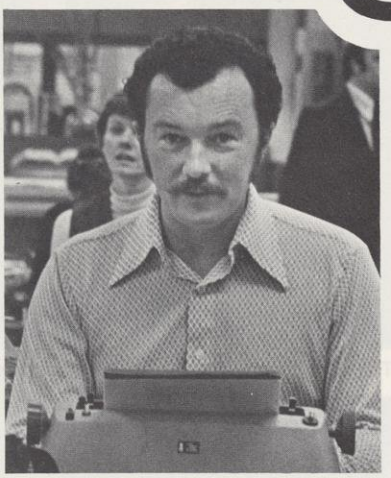
The author holding flowering heads of phragmites that produce the seeds.

Phragmites beds act as natural breakwaters. Note the white-caps off the tip of this bed and note how water begins to still on the leeward side in the foreground. Photo by A. F. Linde

Phragmites plants flower about the middle of August and seeds are well developed a month later. However, reed grass in the up-river lakes appear to set very few seeds. Photo by A. F. Linde

This is Chapter Five from a recently published how-to book for children called **You Can Catch Fish.**

It's a big one



BILL STOKES, Milwaukee Journal Columnist *

Let's try fishing over by the rocks.

Yes, this looks like a good place.

OK, lift your pole up high and swing the line out over the water. When the line swings out, let the end of the pole down quickly. The hook and the sinker and the bobber should go KERPLUNK! into the water.

The sinker will pull the bait down toward the bottom, and the bobber will hold it up so that it doesn't sink too far.

It feels good. It is exciting. You can feel your heart going bump, bump, bump.

So why don't we catch a fish?

Well, sometimes you have to wait a while for the fish to find your bait. Fishermen have to be patient.

While you are being patient, you can look around and see how interesting it is near the water. Look at the waterbugs darting around, and the dragonflies zipping back and forth like little helicopters. Maybe a turtle will poke its head up. And the frogs are always up to something.

HEY!

THE BOBBER!

It's jerking up and down in the water.

SWOOOOOOSH! Up comes the pole and the line.

But there is no fish. There is only the worm on the hook.

What happened?

What happened was that you pulled up your line too quickly. You pulled it up before the fish got the hook in its mouth.

Fish often just nibble at the bait before they swallow it. This nibbling makes your bobber jiggle up and down. This makes you think that you have a bite, so you grab your pole and pull up the line.

When you see your bobber wiggling, it is best to wait for a few seconds. Usually the fish will swallow the bait and then start to swim away. When it does this, your bobber will start to move through the water and then sink slowly. Sometimes it will go all the way under the water.

That is when you should bring your pole up quickly and pull your line out of the water. Chances are you will have a fish.

So, after all of that, let's try it again.

Lift your pole.

Let the line swing out.

Drop the tip of the pole so that the hook and sinker and bobber KERPLUNK into the water.

Now watch carefully. Maybe the fish will come back. Wait. Listen to your heart thumping like a bird in a box.

THERE!

The bobber is wiggling again.

The fish is back. It is nibbling. Don't pull up yet.

The bobber is still wiggling. Now it is starting to sink and it is moving out away from shore.

NOW!

Up comes the pole. And suddenly the end of it is bent down toward the water and you can feel something jerking on the end of your line.

EEEEEEEEOWWWWWWWW!

You've got a fish on.

Don't pull too hard or you will break your line or your pole.

Wow! Look how the pole is bent. The fish must be a big one.

Whoops!

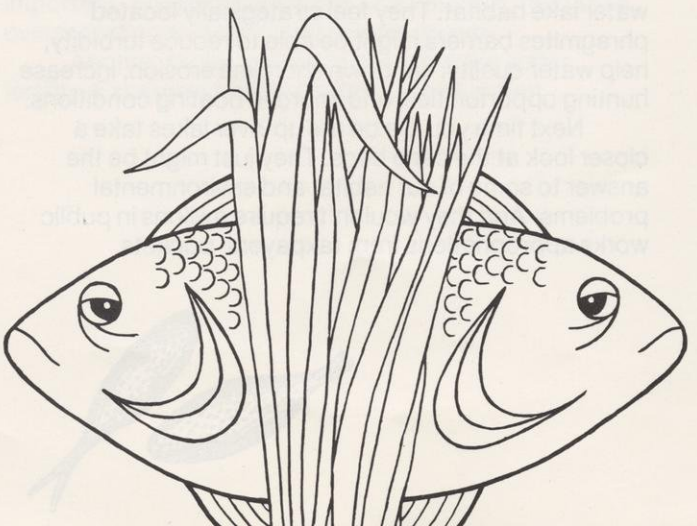
What happened?

The fish is gone.

Oh, fish feathers!!!!!!

What happened was that you let the end of your pole down for just a second. The line didn't stay tight between the fish and the pole. If a fish gets some slack line, it will get away almost every time.

* Bill Stokes is a longtime fisherman, columnist and former outdoor writer for several Wisconsin newspapers.



Oh well, let's try it again.

Out goes the line.

KERPLUNK! Into the water goes the baited hook and the sinker and the bobber.

Now, more waiting and watching. Don't feel bad about losing a fish. There will be another one along.

THERE! SEE!

The bobber is wiggling.

It is wiggling and wiggling.

Now it is not wiggling anymore.

Maybe we had better check the bait.

Pull your pole up and take a look.

Sure enough. The hook is bare. A fish just nibbled the worm right off without ever really grabbing the hook.

That happens sometimes.

Well, put on another worm.

Then out goes the line again.

Hey, there is hardly any wait at all this time. The bobber wiggles a little and then with a sudden PLOP it disappears under the water.

PULL UP!

Look at the pole bend and jerk.

There is a fish on. It looks like a whopper.

Keep the line tight.

WOW! Look at how hard the fish is pulling on the pole. .

The fish is coming up toward the top of the water.

Here it comes! Oh, look at it jump.

It's a dandy.

SPLASH!

It is back in the water again, but it is still on the line. It isn't pulling quite as hard now. It is getting tired.

Pull your pole up some more and ease the fish toward shore.

That's it.

Easy now, here it comes.

THERE IT IS, OUT ON THE SHORE, FLOPPING AND TRYING TO GET BACK INTO THE WATER.

Grab the line with your hand and pull the fish farther up on shore.

It's a beauty.

And you caught it all by yourself.

Now your heart is really thumping and you've got a smile so big it makes your ears wiggle.

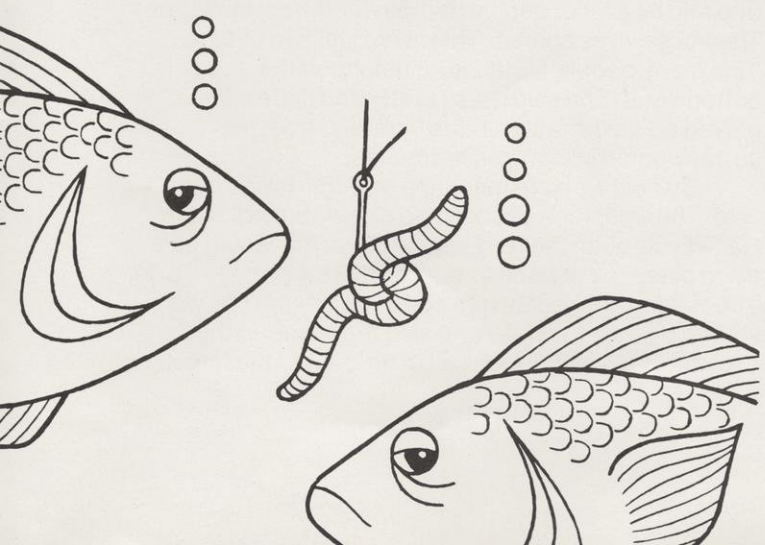
Just look at that fish.

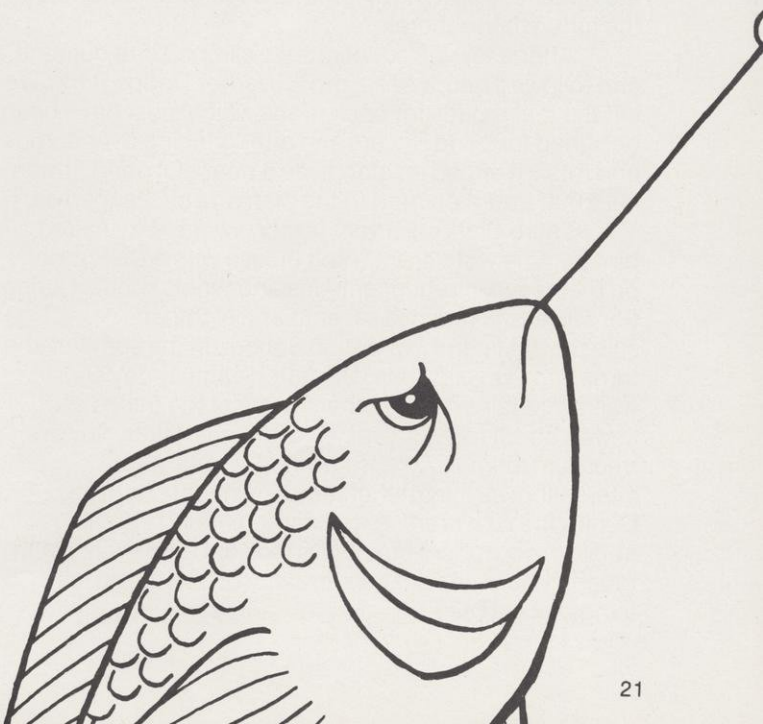
Older people will say, "Aw, you didn't catch that fish, did you?"

And then you can say, "I sure did."

Well, why not catch some more?

Line drawings by Nancy Mack





Governor Dodge State Park: a natural experience

DENNIS R. RICHIE, Free Lance Author, Rural Cambridge

She pointed to a sandstone cliff jutting out of a hill miles and miles away and said: "We'll end up on top of that." She paused and looked at us quizzically. I knew she was expecting us to chicken out and go home. We didn't. Instead, we said: "Good." And off we went.

I didn't know what to expect when I decided to take one of the nature hikes at Governor Dodge State Park. I was ready for anything. I had old clothes on and hiking shoes (Later I wished I had brought a hat and some bug repellant) . I had looked over the week's schedule at the park entrance earlier. It offered two and sometimes three hikes a day. That week I had my choice of *Ferns and Wildflowers, Trees and Shrubs, Spring Wildflowers, Let's Look at a Marsh, Let's Look at a Prairie,* or the *Explorers' Hike.* I selected the Explorers' Hike.

It was a beautiful warm summer day with no clouds in the sky. The park notices indicated that those interested in the *Explorers' Hike* would meet at the concession stand at Cox Hollow Lake. That day only eight of us were interested. The group consisted of two housewives, their five children and myself, but later I was not so sure the children were all interested. It was at the concession stand that we met our leader, Laura Clarke, the park naturalist at Governor Dodge, who conducts all the nature hikes there.

After a few introductions we climbed into our cars and followed Laura deep into Governor Dodge Park. We left the main roads for back roads which must have been designed for Land Rovers and after grinding over bumps and ruts we ended up alongside a peaceful pond. It was here that Laura pointed to the bluff and challenged us.

Laura Clarke is a very pretty, sweet, silky haired blonde. She wore a white knit blouse with a DNR patch on the sleeve, hip-hugger jeans and tennis shoes. During the winter she teaches seventh and eighth grade science at Mineral Point High School. In the summer she turns into Daniel Boone. Day after summer day she walks and talks, telling others some of the things she knows about forests, prairies, wetlands, lakes, flowers, trees and animals. She is knowledgeable and interesting, as a matter of fact, downright charming. During the *Explorers' Hike* I learned all sorts of things about the outdoors but never once did I feel I was being taught. Laura has an uncanny way of letting you learn things for yourself.

Laura is also a Grade "A" hiker. Her last name kept ringing a bell with me. I kept thinking "Clarke, Clarke." Then I remembered the Clark who had hiked all over the country with a man named Lewis. After keeping pace with Laura for a half mile I figured she must have been related.

On our first half mile or so we skirted the edge of a forest. We were immediately joined by horse flies which buzzed and buzzed about our heads but didn't bite. They were a nuisance but we forgot about them as Laura showed us spittle bugs, had us listen to a nuthatch and a towhee and stopped to let us admire a rangy oak tree which she said was at least 200 years old. She showed us deer tracks and told us why she thought they were three days old. Then Laura spotted a 17 year locust. She picked him up and told us that the 17 year locust is actually a cicada. Cicadas lay their eggs in the bark of a tree and once they are hatched they fall to the ground and bury themselves. They stay buried for 17 years. Laura reminded us that this one would come out of the ground in 1994. "Horrors," I thought, "I'll be 47."

Throughout the hike we had two types of stops. "Tick" stops and "Rest" stops. During the "Tick" stops we picked off wood ticks which were numerous and during the "Rest" stops—we rested. Shortly after learning about the cicada we had a combination tick-rest stop under a big apple tree with long fanning limbs. Laura told us that this was a popular stop later in the summer since the apples were so good. She told us that in the state parks it was OK to pick *fruits and nuts.*

Shortly after our rest Laura showed us the difference between a quaking aspen and a cottonwood. She told us a lot of people had it in for the cottonwood. The housewives agreed. They were just two of those "the many people". But Laura defended the cottonwood. She said it was pretty and it grew fast. She played down the fact that the "cotton" from the cottonwood sticks to house screens.

By now we were marching through a wide open field. The limestone cliff seemed closer, but not much. Halfway through the field Laura told us this would be a good place to cut back to our cars if we wished to do so. The children immediately voted to go back. They were vetoed by their mothers who said they needed the exercise. We went on. Ahead of us loomed the forest.

Up to now we had not been on much of a trail but in the forest the path was easy to discern. We rushed in. It was like walking off a hot street into an air conditioned building. The air was cool and thick. It was very quiet. Laura showed us where later in the summer her groups would be able to stop and pick wild raspberries and wild blackberries. She showed us the raspberries thorns which were soft and fur-like while the blackberry thorns were sharp and vicious. We went on. Now we were going up and up and up. We rested at a wild strawberry patch. The strawberries were not plentiful but they were sweet and delicious. We munched down all we could find.

We continued climbing. Laura pointed out wild asparagus which she said had probably been inadvertently planted there by birds. The trail got steeper. Laura showed limestone and sandstone formations which had been pitted and carved by wind and rain. We were reaching the top of the hill. We were huffing and puffing and perspiring. I was beginning to wish I had voted with the kids. Then, suddenly I was glad that I hadn't. Laura had led us to the edge of the sandstone cliff. We had reached our objective. And as if a huge curtain had suddenly opened up—we had a panoramic view of the wide expansive valley below us. A strong fresh breeze blew in our faces. We stood it seemed, miles above the rest of the world. We all looked quietly. We were each a miniature Sir Edmund Hillary.

We hated to leave but we had to get on with it. Back into the forest and down the hill. Walking was easier. We were going down hill and we were going back. Half way down the hill Laura saw a deer. The rest of us heard him but could not see him. Laura took time to show us the difference between a white oak and a black oak. She pointed out poison ivy.

By now it was time to leave the forest. We went out into the field. The sun was hotter than when we had seen it last. We had hiked four miles and had one to go. It would be a hot one.

In the field Laura showed us a Cinquefoil flower. She told us Cinquefoil meant "five fingers" and she showed us how the plant's leaves grew in groups of five finger-type leaves. She showed us a meadowlark's nest which held four eggs. When we came to a little grove of trees we rested and studied burdock which looked like rhubarb's ugly cousin. Laura told us there was no relation.

Now we could see our cars but between us and them lay the pond. We would have to skirt it before we completed the trek. On the pond's edge Laura pulled up wild carrots. They looked unappetizing but did smell like carrots. In the pond we could see bass cruising around and sunfish hovering over their spawning nests. Laura showed us where a muskrat had stirred up the water. She kneeled down and peered under the bank and found a hole but no muskrat. We stomped the bank hoping he might come out. No dice.

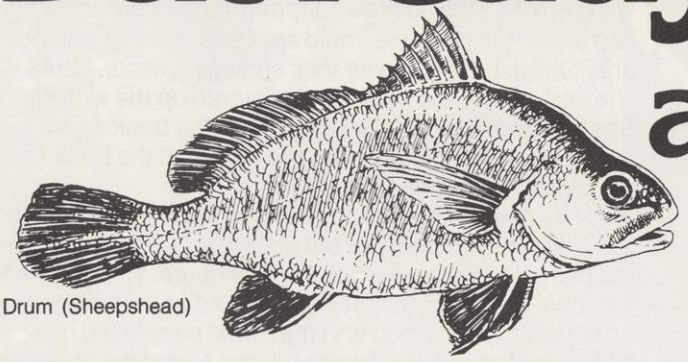
By now we had circled the pond and were back to the cars. They looked hot but comfortable. Laura told us the five mile hike usually takes three hours. We had done it in 2 hours and 27 minutes. Laura told us that we were an unusually fast group and that most people did not hike as fast as we. We congratulated ourselves on being one of the best groups Laura ever had and more or less decided that we were probably superior hikers in general.

The housewives said that they would see Laura in the morning for her wildflower hike. The children did not seem enthusiastic.

Earlier Laura told me that when she first got her job at Governor Dodge she would get so tired that at night she would go home and go straight to bed. She asked me if I was tired. I told her no. I told her I enjoyed the hike. Then I went home and went straight to bed.

Line drawing by Jim McEvoy

Rough, but ready to eat and delicious



Drum (Sheepshead)

VERN HACKER, Supervisor, Warm Water Fish Management, Oshkosh

Hungry?

How about "lobster imposter" with drawn butter, a "sucker salmon" salad or a piping bowl of "Oooooo chowder."

Such headings are part of the delicious detail in a lengthy list of recipes just published by DNR and appropriately titled, *A Fine Kettle of Fish.* The new booklet tells you how to cook up mouth watering meals of carp, buffalo, sheepshead, burbot, suckers, redhorse, gar and even crayfish and turtles.

All these great food fish are suddenly at the top of many people's yum-yum trees, proven by taste test and reinforced by high prices of imported fish and other protein at the market. *A Fine Kettle of Fish* is testimony to the fact that people not only indulge in such cookery, but brag about it to boot. Its contents are gleaned from cooks in 30 different states who sent in hundreds of recipes, all because DNR had incidentally asked for them in a little folder issued last year designed to popularize rough fish cookery. Seemed like it was plenty popular already and *A Fine Kettle of Fish* was the result. Doubters can try the accompanying recipes.

Carp Chowder

This recipe makes approximately 3 gallons, so you will need at least a 12-quart kettle. The chowder freezes very nicely.

Take at least 4 pounds of carp. Skin and fillet, then remove the streak of red flesh and mud vein. Chunk the fillets and boil until the fish flakes. Save the liquid. After the fish cool, remove the bones and reserve the flaked fish.

Peel, quarter, and thinly slice 5 pounds of a good white potato. Rinse several times in cold water to eliminate excess starch. Pour off water after the last rinse.

Put into blender one 3" diameter onion. Reduce to mush. Add to potatoes. Add 1-3/4 tbsp. salt. Add the liquid used to boil the fish to the potatoes and onions. You will need enough to cover the potatoes. If you don't have enough add additional water to cover, then add 2 more quarts to give proper consistency. Boil until the potatoes are soft. DO NOT POUR OFF THE LIQUID. With potato masher, reduce about 3/4 of the potatoes to a puree. Add a 28 ounce can of whole tomatoes. Put in blender for two seconds to break up. Add a family size can of tomato soup. Turn down heat. Add the flaked fish, 3/4 tbsp. black pepper, 1/2 pound butter or margarine, one pint of half-and-half coffee cream, 1/2 pound soda crackers reduced to meal in a blender.

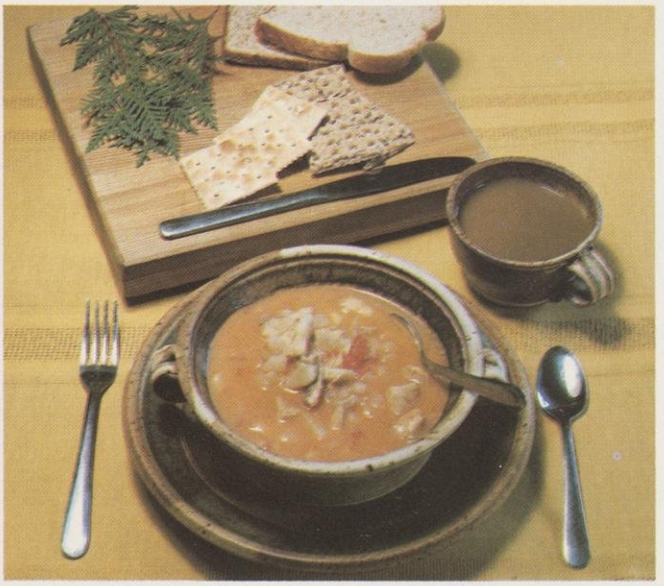
Simmer combined ingredients for 30 minutes. Then eat and enjoy. This chowder is a meal in itself.

Poor Man's Shrimp Cocktail

Skin and fillet the boneless strips from burbot or freshwater drum (sheepshead) you always used to throw away. Cut the fillets in one inch by three inch strips. To two quarts of water add two tablespoons of salt. Bring to a boil. Drop the fish strips in the water. When it returns to a boil, start timing. After two minutes remove the strips, and rinse under running cold water. Chill them in the refrigerator. Prepare individual salad bowls by lining with lettuce. Cut in some celery chunks. Add cold fish strips. Cover with a seafood sauce of catsup and horseradish prepared to your taste. Overeat. Vow never to throw another fish away!

The author brews up a batch of chowder.

Poor man's shrimp cocktail.



Carp chowder.

Photos by Dean Tvedt

Old smoothies

Protein is a hot item on the world food market right now and may someday help Wisconsin's abundant rough fish evolve into old smoothies. But it was not always thus.

Since the start of the 20th century, efforts have been made to remove undesirable species from Wisconsin waters. On April 27, 1900, the Wisconsin Fish Commission authorized James G. Joyce of Eau Claire and George Early of Chippewa Falls to "take and destroy gar fish and other deleterious fish in Long Lake (probably in Chippewa County) and adjacent waters."

Starting in 1879, carp imported from Europe where they are highly esteemed, were stocked in Wisconsin. By 1915 there were so many that the newly created Conservation Commission issued 19 contracts for removal of these "commercial" species.

In the past 60 years, an estimated 500 million pounds of so-called "rough" fish have been taken from Wisconsin waters in nets and traps. Of these, 62% were carp, 29% freshwater drum or sheepshead and 5% buffalo fish. More than 85% of the total was used for human food.

After 1941, chemical treatment was also used to get rid of unwanted species. With this method, they can be completely eradicated or so reduced that many years will elapse before they can again become abundant. Unfortunately, (which may be "fortunately" in the future) there are so many rough fish, particularly in the southern half of Wisconsin that it is physically and economically impossible to eradicate them all.

As rough fish take on the smooth characteristics of respectability in the frying pan, people are beginning to learn that they are not "scavengers" — that they don't swallow unmentionable materials glommed from the bottoms of lakes and streams. Burbot (lawyers) drum, gar and dogfish made the rough list simply because they feed on the so-called game species. Buffalo eat only live microscopic food organisms, exactly the same as panfish. The only difference is that panfish also eat larger foods and will bite on bait as big as an angle worm, whereas buffalo are almost never taken on hook and line.

Carp, redhorse and suckers all feed on live insects, larva and plant materials. Carp prefer a soft bottom habitat (like the sturgeon), while redhorse and sucker usually like a harder bottom substrata and therefore no water turbidity results from their thrashing around as happens when a school of carp riles a muddy bottom.

Isaac Walton, the father of all fishermen, described the carp as "the queen of rivers, a stately, good and very subtle fish."

The burbot is the only member of the cod family that lives in freshwater. Delicious eating, it was probably put on the rough fish list because it lives almost exclusively on perch. Right now, burbot are being studied as a possible control for stunted perch populations in land-locked lakes. They are unique in that they spawn under the ice.

Sheepshead get their name, freshwater drum, from the drumming or purring sound they make during spawning.

And even the gar (which has poisonous eggs) is in great demand as a food fish in several southern states. Down there, it's about as expensive as lobster and reputed to taste like a combination of pork and fish.

Carp, buffalo, suckers and redhorse contain "Y" bones like northern pike and muskellunge, but these are easy to handle. *A Fine Kettle of Fish* will tell you how.

The next step is to start asking for these species at your favorite fish store or supermarket. When everybody does, maybe we'll be able to put to use the estimated 200 million pounds that swim about in Wisconsin waters today. Maybe too, you'll discover what fun it is to catch them on hook and line.

Someday you may even look back to the present as the "good old days" when you could catch all the rough fish you wanted without a bag limit. When that time comes the day of the old smoothie will have arrived for sure.

The recipe book, *A Fine Kettle of Fish,* will be published this summer. It may be ordered by sending a $1 check or money order to: *A Fine Kettle of Fish,* DNR, Box 7185, Madison, WI 53707.

Heritage Hill: new park for the state's oldest buildings

LOREN M. THORSON, Chief, Recreational Programs

Wisconsin history in the era of the Revolution has literally come to life at Heritage Hill State Park near Green Bay which opened early this summer.

Located at DePere, this new park lies just across from the Green Bay Reformatory at the east end of the recently completed Allouez-Ashwaubenon bridge (Highway 172) crossing the Fox River.

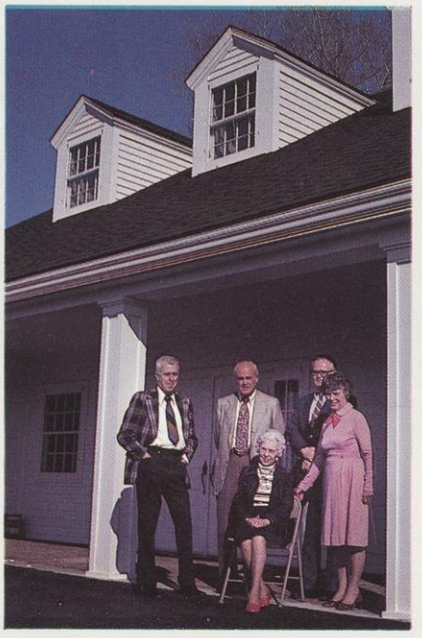
Its creation was the outgrowth of local efforts begun in 1967 when the Brown County Historical Society considered the probable fate of several rare historic buildings in the Green Bay area. Prominent among these buildings was the cottage built in 1776 by fur trader Joseph Roi, and later purchased by a wealthy Norwegian missionary, Nils Otto Tank. Known as the Tank Cottage, this is the oldest building in the state, and echoes Wisconsin ties with the French and English fur trade and the search for a route to the Orient. Nowhere does Wisconsin's history stretch further into the past. Jean Nicolet landed at nearby Red Bank in 1634, only 14 years after the Pilgrims arrived at Plymouth Rock.

Heritage Hill is the result of a local historical society idea that buildings like the Tank Cottage and others be "collected" and moved to a common site to insure protection and preservation. Movers and shakers behind the idea were three members of the Park Committee of the Brown County Historical Society: Amanda Cobb, Dorothy S. Wittig and Architect Len Schober. They saw the possibilities when land became available, stimulated the interest of DNR and successfully shepherded the whole project through a local referendum.

The location jibes with a new state policy that gives priority to park development near population centers as a means of conserving energy and maximizing public use.

ADMISSION FREE IN 1977

Entry to Heritage Hill State Park will be free this year and no park sticker is required. The admission fee is expected to take effect next year after final finishing touches are put on landscaping, furnishing and construction. Anticipated fees for 1978 are $2 for persons 17 and older, 50 cents for ages 6 through 16 and 40 cents for students accompanied by teachers.



The idea for Heritage Hill and the push that made it real came from the Park Committee of the Brown County Historical Society. Right to left, they are Amanda Cobb, Bob Flatley, Dorothy Wittig, Len Schober and the Rev. Dean Kilgust.

Heritage Hill is the state's first urban historical park and DNR has committed nearly $2-million to its initial development.

This summer 14 historic buildings and a visitors' center were opened to the public. When fully developed there will be more than 20.

The following are open now:

Tank Cottage. The oldest building in Wisconsin, constructed in 1776.

Baird Law Office. Built in 1835, it was used as the first land office west of Detroit. It was subsequently purchased by Henry S. Baird as his law office. Baird was Brown County's first practicing attorney, Wisconsin Territory's first Attorney General, and Mayor of Green Bay.

Fort Howard Hospital, Ward Building and Officers' Quarters. These three buildings were constructed about 1816, and were part of Fort Howard. President Zachary Taylor served at the fort when he was an Army officer, and Jefferson Davis, later President of the Confederacy, also served there as a young lieutenant. Dr. William Beaumont, famous for research on human digestion, was the post surgeon in 1826.

Cotton House. Built in the 1840's by Army Captain John Winslow Cotton, this Greek Revival style house was moved to its present location atop Heritage Hill in 1930.

Other buildings include the Franklin Firehouse, built in 1873; the Allouez Town Hall, built in the early 1870's; a trapper's cabin dating from about 1820; an early blacksmith shop and an early carriage house.

Heritage Hill State Park is also the site of the first courthouse in Wisconsin. A stone basement thought to be from the original structure still exists. A courthouse building has been reconstructed that duplicates the original design.

A 400-foot long section of the plank road which once connected Green Bay's Fort Howard with Fort Winnebago at Portage also will be reconstructed at Heritage Hill on a portion of the road's original route.

Moving these historic buildings gave everybody involved many moments of anxiety. There was always the possibility that any one of them might "fall apart" despite the assurances of structural engineers. They used a novel approach of moving the buildings by barge via the Fox River. In the words of one official "many a heart skipped a beat" during the voyage down the ice-clogged river.

All buildings will be furnished with artifacts and antiques representative of the period.

The park is a tribute to the many citizens, public officials and civic groups in Brown County who worked to insure the preservation of this era of Wisconsin's history. To continue the work, citizens in the area have formed the nonprofit "Heritage Hill Corporation" and under an agreement with the Department of Natural Resources the corporation will manage and operate the park. In addition a "Heritage Hill State Park Foundation" has been formed through which individuals, industry, service clubs, special interest groups and others have the opportunity to make financial or historical contributions.

Top right: Cotton House

Photos by Dave Crehore

Center: Nancy Smith demonstrates a butter churn in the restored summer kitchen at the Tank Cottage.

Bottom: Tank Cottage, the oldest remaining building in Wisconsin, before being moved to the park. Photo by M. Thayer

Steel is a better bullet
or demise of the poison pellet

Photo by Sherman Gessert

Steel shot will eventually get rid of lead poisoning. This year for the first time it will be the required load in critical waterfowl hunting areas of Wisconsin. The author, a man who knows a lot about steel and lead, tells the why and wherefore of the new rules and how they might even make you a better shot.

WILLIAM B. PETERBURS, Mequon, Chairman, Migratory Waterfowl Committee, Wisconsin Conservation Congress

Lead poisoning has been killing waterfowl in this country for more than 100 years and lead shot is the cause. Waterfowlers like you and I deposit some 3,000 tons of lead in the birds' habitat each year. This amounts to about 13 billion pellets or an average of 150 every year for each and every bird in the fall waterfowl population. Consider that one #6 pellet in a duck's gizzard can kill it or that it takes only five to six ingested pellets to make a bird's death 80 to 90% certain and you have an idea of the tremendous time bomb we create.

It works like this:

The bird swallows the shot while feeding or picking up grit. Ingested pellets are ground up by the gizzard and form lead salts which enter the blood stream and paralyze the digestive system. This causes slow starvation and death in about 20 to 21 days. Poisoned birds quickly lose the ability to fly and then seek deep cover and concealment. They are rarely seen by hunters except when they die in such large numbers that predators and scavengers cannot keep up. Often they turn up some distance from where the poison pellets are ingested. These so-called "die offs" are but a mere surface manifestation of the far greater losses which occur day-to-day unnoticed and unreported.

The disease claims a conservatively estimated two to three million birds a year. This is equal to the combined production of both Ducks Unlimited and the Duck Stamp habitat program. *Each year lead shot is used we lose and waste the equivalent of all the production from habitat that has taken more than 40 years and over $200 million to acquire.*

We are now in the process of stopping this waste by shifting to non-toxic shot for waterfowl hunting. Since the vast majority of birds poisoned get it from shot fired the current season, benefits will accrue immediately. Steel shot, which was developed 28 years ago, is the only non-toxic shot presently available and therefore is what we *must* use.

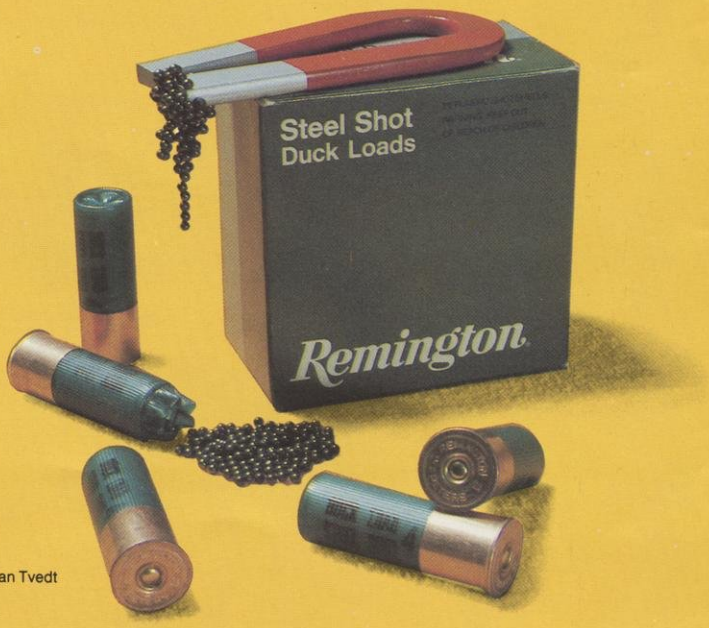


Photo by Dean Tvedt

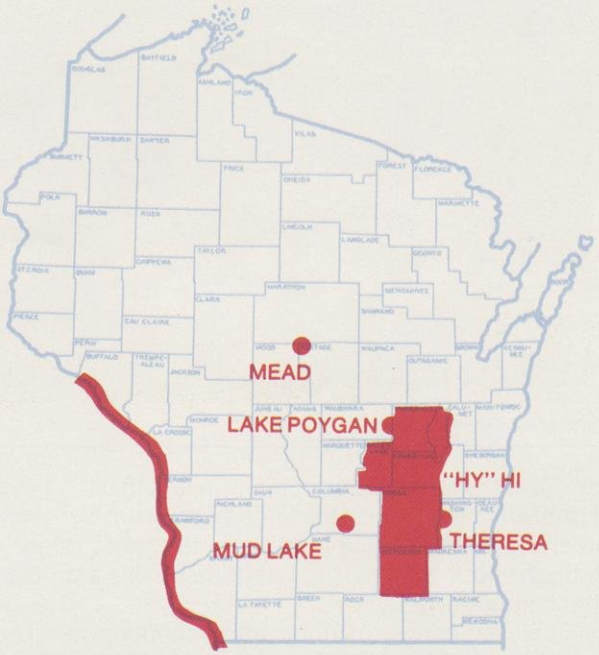
Ballistically speaking, there are several characteristics of steel loads which make 1-1/8 ounce steel charge as effective as 1-1/4 ounces of lead. The pellets do not deform when fired. As a result, they have better aerodynamics.

This is how they compare:

1. Individual steel pellet energy remains uniform while lead pellet energy varies considerably.
2. Steel patterns run 5 to 7% tighter than lead patterns.
3. Steel shot strings are much shorter than lead shot strings.
4. Size for size, there are about 28% more pellets in 1-1/8 ounces of steel than in 1-1/4 ounces of lead. For example, 1-1/8 ounces of #4 steel contains 213 pellets while 1-1/4 ounces of #4 lead contains 166 pellets.

The total result is a much denser shot cloud which delivers more energy to a fast moving target than a comparable load of lead. This has been confirmed by extensive, highly qualified and independent research.

Additional research has shown that whether shooting lead or steel, the average hunter is not very effective at ranges much beyond 35 yards. So the much advertised long range effectiveness of lead, which has been an open invitation to shoot at ranges where very



Places where steel shot will be required in 12 gauge shotguns this season as the first step toward eliminating lead poisoning in waterfowl. The rule covers all waters in the colored area except drainage ditches and sheet water and extends 150 yards onto adjacent lands. Along the Mississippi River the rule affects everything west of the Burlington Northern Railroad tracks.

Truckload of geese that succumbed to lead poisoning Photo by Stephen Kerr

Whistling Swans

few have the skill to be effective is meaningless for most hunters at most times. I think the *biggest* problem with steel shot will be the hunter's ability to shoot straight enough to put the bird in the pattern. But it's a problem that can be solved.

My experience in four years of shooting steel shot confirms this. The first year was remarkable: I shot up four boxes and missed 80% of the birds. . . and I'm *not* that bad a shot! I analyzed this experience, and found that the fault had been mine and not steel shot's. I had been shooting in the same old way, using a full choke and not always waiting for a close-in chance.

I made two adjustments: used a more open choke, and started placing a decoy at 35 yards. If the birds are not inside that decoy, I don't shoot. As a result, I use less ammunition. Before it took four to five lead rounds per bird bagged but with steel it's down to less than two. In 1974 I got a triple on blues — three shots — three geese!

An *expert* could probably extend the range to 45 or even 50 yards and still be successful. . . but not me! I want to be sure I'm shooting at a range where I have the skill to put the bird in the pattern, not on its fringes. As a result, I may bring home a couple less birds a season, *but* I'm not leaving four or five cripples in the marsh. I've also had to learn to be a better caller and to camouflage myself more completely. The net effect is that I now have a more complete and enjoyable hunting experience plus the pleasure of knowing I am helping preserve the resource and sport. Your experience will be up to you. Mine tells me that, like lead, steel is effective when used properly.

Many shotgunners have visions of scratched barrels and shot out chokes from steel shot. This may have been true of some of the early loads but today, both the shot and special shot-cups to protect the barrel have been greatly improved, considerably reducing the possibility of damage. If you are concerned, contact your shotgun manufacturer who will be happy to answer questions on this. In general, from tests and information I have seen, the chance of barrel damage is rather remote, especially if you use a modern American made shotgun.

Initially, ammunition will cost more. However, as production and competition increase, we should see the price come down. In the meantime, if you watch what you're doing and make every shot count, you may actually reduce ammunition costs as I have. I used to shoot about four to five boxes of lead a year. Now I shoot about two boxes of steel and, even at $8.95 a box, my cost is lower than before and my bag is about the same. *Your* ammunition costs will be up to you.

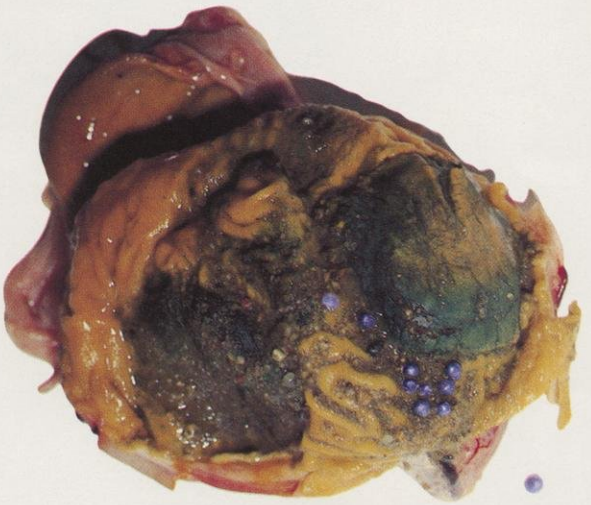
Incidentally, before any steel shot handloading, check with manufacturers. Special components are needed so don't endanger your equipment.

According to basic Fish and Wildlife Service policy, steel shot will ultimately be required for all waterfowl hunting in Wisconsin. However, this year because it is physically impossible for manufacturers to provide enough steel to fully implement the program, the Service has temporarily made the policy less stringent. Steel shot will be required within 150 yards of water, only in the areas outlined on the map which accompanies this article. In addition, since steel shot is available only in 12 gauge, the Service has temporarily authorized lead shot for gauges other than 12 in those areas. These were reasonable compromises which, in addition to getting the steel shot program started, will give the hunter a chance to get used to the idea and give it a try.

To sum up: lead poisoning is a man-made problem that has a solution. It causes serious, significant and unnecessary waste of a magnificent resource. To eliminate this waste we waterfowlers will have to change our habits, make sacrifices and learn to shoot straighter than we ever have in the past. Steel shot is very effective when used properly and there is sufficient reason to justify the change.

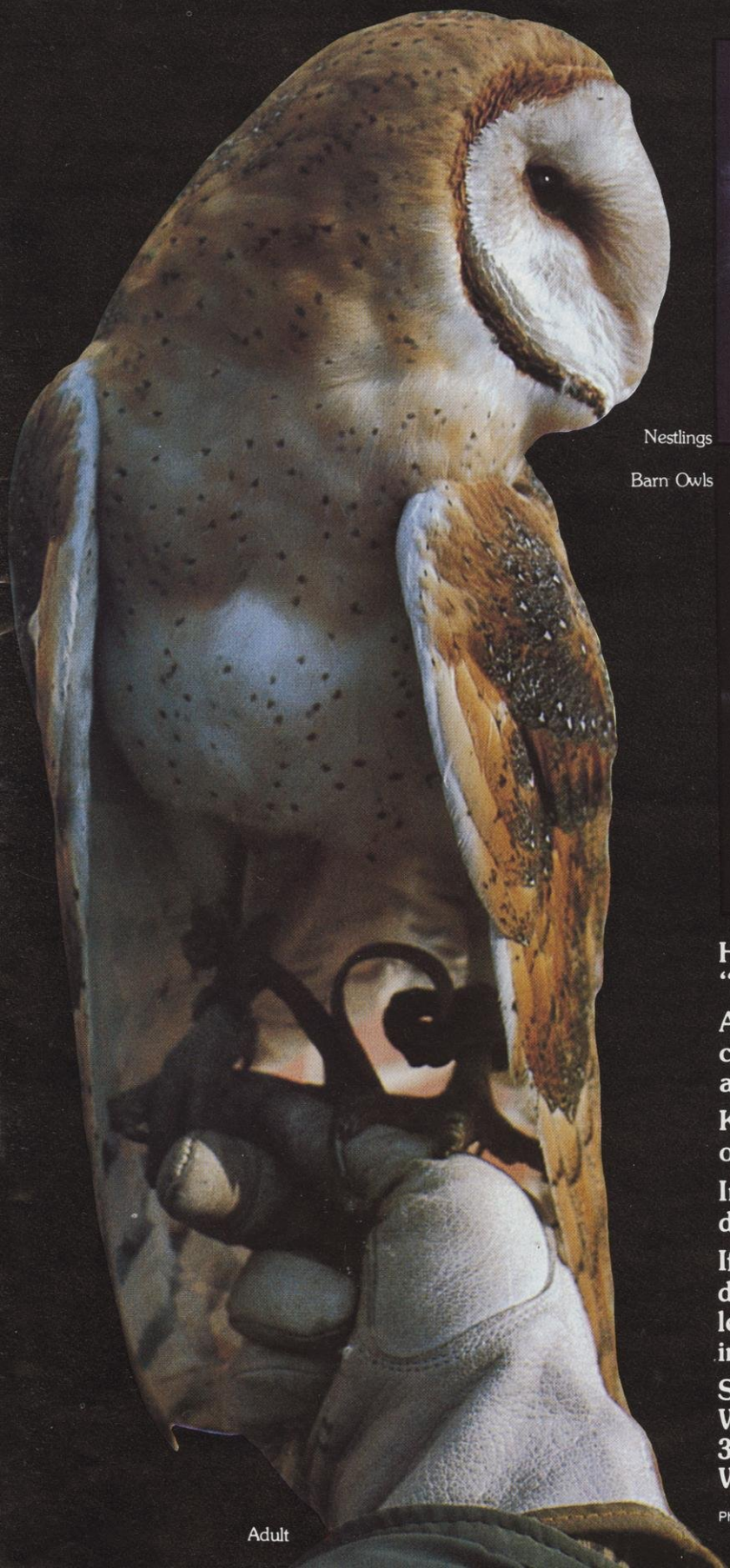
Today, from many quarters, hunters and hunting are beseiged and besmeared. Whether it is justified is beside the point. It *is* there. I believe, therefore, that we must take every opportunity to demonstrate willingly our professed concern for preservation of wildlife by making *needed* changes in our hunting traditions. Steel shot *is* such a change and opportunity. Willing and understanding acceptance is just one of the ways we can help preserve the resource and the sport. I think it is a very small price to pay.

Photos by E. Bell



A dissected goose gizzard showing lead shot which caused death.

WANTED: Barn Owls



Adult

Nestlings

Barn Owls

Has been known to use the alias: "Monkey-Faced Owl."

Are frequently found in farm buildings, silos, church steeples, attics, abandoned houses, and sometimes, tree hollows.

Known to be ruthless killers of mice and other rodents.

Information needed to update barn owl distribution and abundance in Wisconsin.

If observed during the *past five years*, report date seen (month and year), and location (at least township and county.) Of particular interest are nesting observations.

Send reports to: LeRoy R. Petersen, Wisconsin Department of Natural Resources, 3911 Fish Hatchery Road, Madison, Wisconsin 53711.

Photos by Ursula & LeRoy Petersen; General Biological Inc.

Department of Natural Resources
Box 7191, Madison, Wisc. 53707

SECOND-CLASS
POSTAGE PAID
AT MADISON
WISCONSIN