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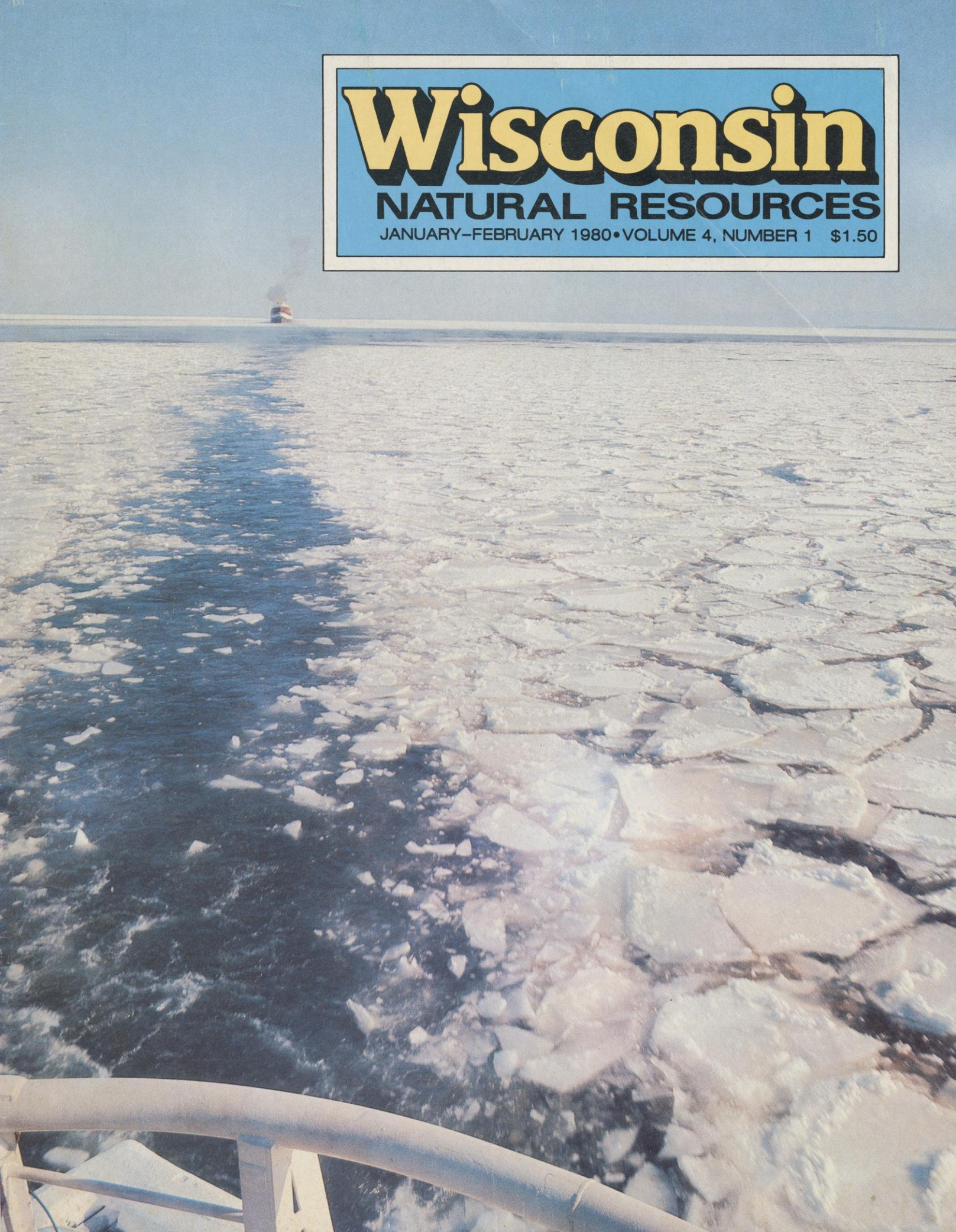

Wisconsin NATURAL RESOURCES

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Catfish in winter

Catfish are big and ugly and delicious and their life in winter is a bit bizarre. Wisconsin has two kinds: the huge flathead (Pilodictis olivaris), and the more common channel catfish (Ictalurus punctatus).

Flatheads can weigh as much as 80 pounds. The state record is 61. In Wisconsin they live only in the Fox and Wolf Rivers and the Mississippi and its tributaries. Channel cats, on the other hand, inhabit nearly all streams in the southern half of the state. They can be big too, (state record 44 pounds, national 58) but the ones anglers catch usually run only four or five pounds. Flatheads commonly scale around 20 pounds and most are caught on bank poles with live bait.

Winter for both species of catfish is an extremely quiescent, dormant period. They are often found in large aggregations and there is worry that they might be especially vulnerable at this time. To find out more, DNR biologists from Wisconsin and Minnesota conducted a cooperative study on wintering catfish in the Mississippi River. Four men did the work: Bruce Hawkinson and Gary Grunwald of Minnesota, Mike Talbot of Wisconsin, and diver-photographer Doug Stamm of the UW-Sea Grant and Marine Studies Office.

Nearly every catfish they found was on the channel border behind a rock, facing upstream and absolutely motionless, without even eye movement. The more rocks, the more fish, so that near wing dams and along rip-rapped shores where boulders had rolled to the bottom concentrations were heavy. Big rocks often sheltered more than one fish and sometimes big fish sheltered small fish. Where there were no rocks, very few fish were seen except in depressions in the bottom or behind woody debris. Populations were highest where rocks were plentiful and sand clean. The four biologists think catfish deliberately seek out rock shelters in order to remain motionless with minimal energy output. River current in these spots was near zero. Populations in some places were calculated at 2,350 catfish per acre.

The study took place in February and in many cases the fish had remained motionless so long they were coated with river sediment. Divers could gently stroke or tilt them without eliciting a response. Only when grabbed by the tail did the fish react.

Biologists think the rocks are critical to wintering catfish and they have some concerns. They fear that Corps of Engineers proposals for depositing dredge spoil in scour holes and bends of the Mississippi could destroy winter habitat by covering the rocks. Flushing the spoil out in spring would be too late.

They also worry about winter navigation. Tow boat propellers could dislodge fish, cause excessive energy loss and possible death.

Another concern is overharvest by commercial fishing. So far most catfish have been harvested in summer. But new sophisticated gear coupled with new knowledge about winter aggregations could spell trouble.

The fact that biologists have now learned about catfish in winter could one day save sport and commercial angling for both species in the Mississippi River. Without their knowledge, some man-made change could wreck things and we'd never know the reason.

Photo by Doug Stamm, UW-Madison Sea Grant Institute

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Front Cover:
A Great Lakes vessel smashes a lonely path through winter ice to demonstrate feasibility of year round navigation. The idea has stirred controversy. For details see the story on page 17. A related special supplement on Wisconsin coastal management begins at page 16.

Photo courtesy of Seaway Review Magazine.

Back Cover:
No modifications are proposed for most small Wisconsin harbors like this one at Algoma under a Corps of Engineers design for winter navigation. Story on page 17.

Photo by Alice Kaufman.

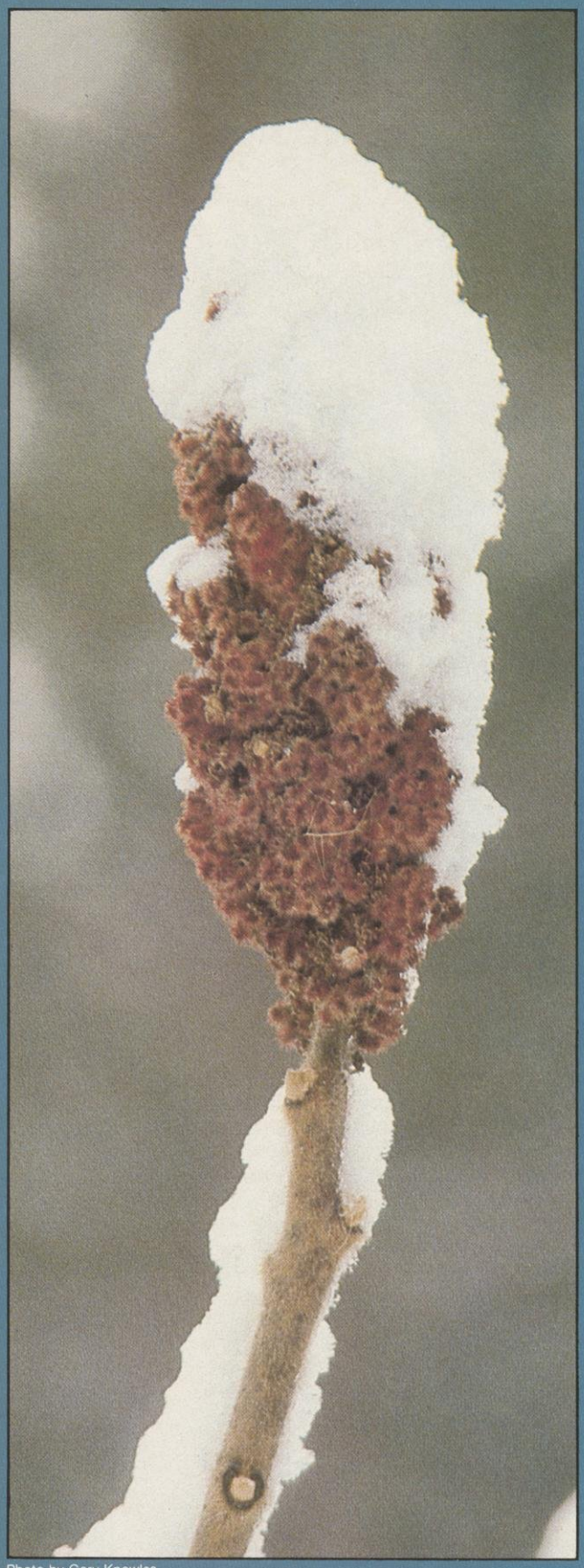

Photo by Gary Knowles

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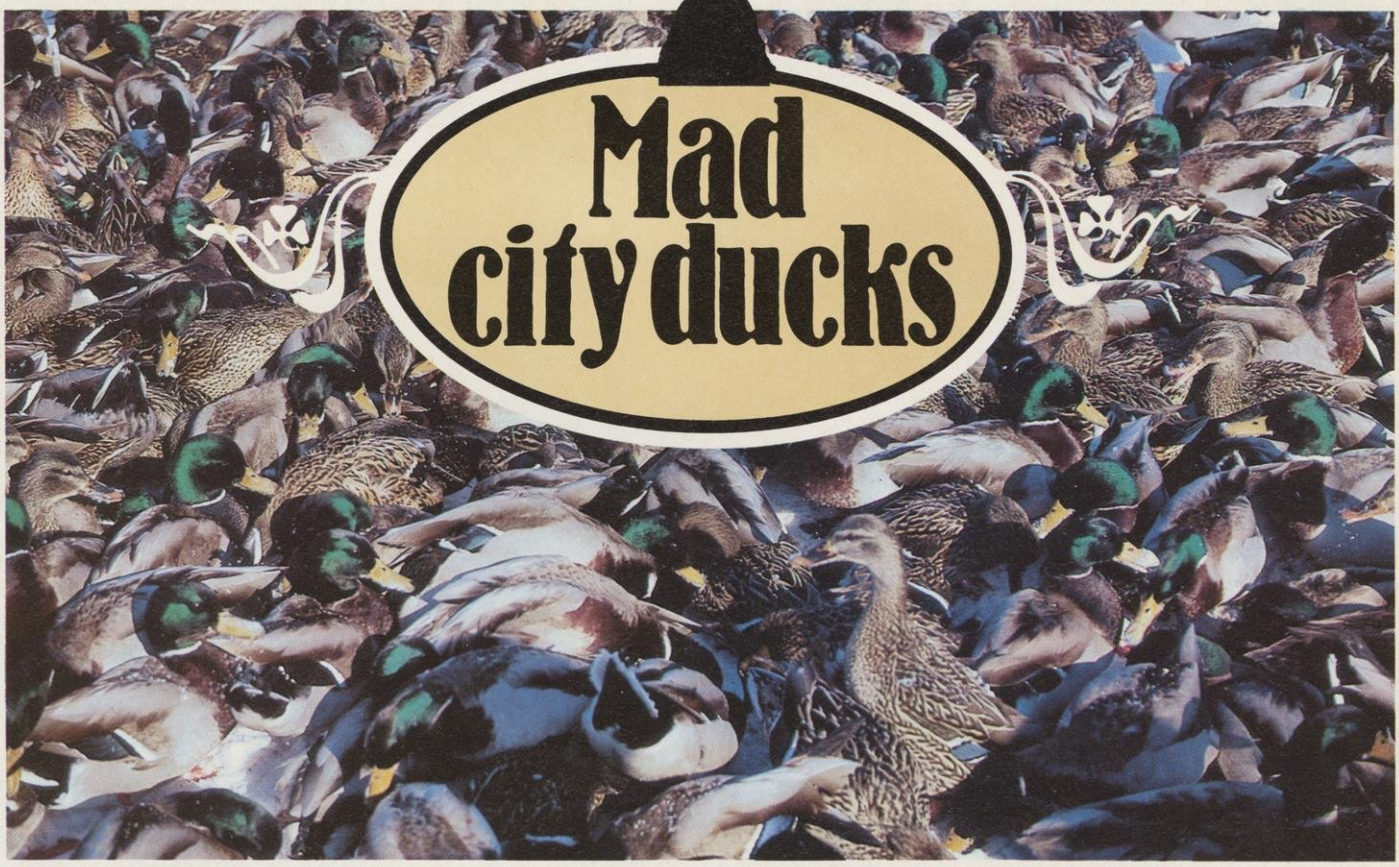
Mad city ducks



In the fable about the mice, the country cousin was scared stiff of the city. It's not that way with mallards.

SCOTT CRAVEN,
Wildlife Extension Specialist,
UW-Madison

This is a story of city ducks and country ducks. Country ducks are the ones that get shot at in fall while they scoot south. City ducks are different critters. They just stay here in Wisconsin the year round because the livin' is easy and people pamper them. They get fed, photographed and watched by the hour. Sometimes people get mad at them; but mostly it's all delight, especially for kids and old folks. One study in Massachusetts showed that 35,000 people a year were attracted to Norumbega park just to look at the ducks.

In Wisconsin, location and size of the various flocks have been pinpointed by the Audubon Society in annual Christmas counts. Two years ago more than 12,478 mallards were permanent residents here. (Flocks at Stevens Point, Eau Claire, Watertown and Janesville were not counted.) Sixteen Wisconsin cities had flocks of more than 100. The largest were: Madison with 2,452 birds; Appleton, 2,182; Green Bay, 1,928; Milwaukee 1,052; Racine, 1,026; Beloit, 703; La Crosse, 559; and Hales Corners, 518.

How do these flocks start and why are the birds invariably mallards? Madison's year-round ducks have been studied and give some answers. It all began in the early 40's when a UW professor, hoping to improve hunting, stocked some mallards in the Arboretum. They were supposed to fly out into the country and help shooting. Instead they went the other way and adapted to the city. With relative protection from hunting and occasional springtime infusions of "Easter ducks" from well meaning citizens, they flourished. The spattering of strange plumage on some birds happens when one of those different Easter ducks breeds with a mallard.

Outside Madison, in other Wisconsin cities, flocks may have started simply because mallards are adaptable and quick to domesticate. All it takes is a few wild birds or perhaps several crippled or sick ones that respond to food and protection. Once established, a flock can decoy wild birds and grow that way. Urbanization is mostly for mallards. No species responds to a city environment like they do, though once in a while a black duck or some other kind

UW-Arboretum

joins the group.

Since city flocks are non-migratory, they live in town all year-round. Birds overwinter, nest, rear broods and molt on an annual cycle of their own— and sometimes in funny places. Exactly why they fail to head south isn't known. Speculation is that since they have plenty of food and open water and no migrating tradition, they probably just don't have to or don't know how. And the instinct may not be as urgent in mallards as in some other species.

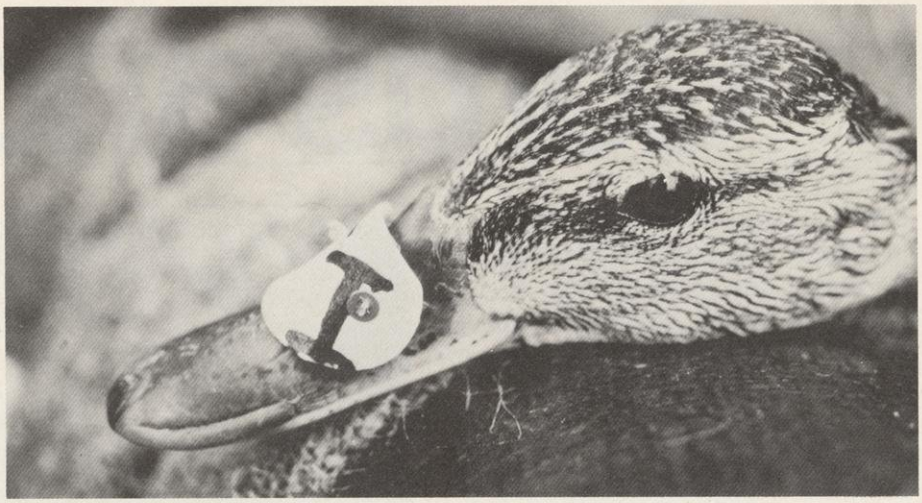
The study in Madison started in the fall of 1974 when 100 birds were banded at the UW-Arboretum duck pond. Of these, 65 were also marked with individually coded plastic nasal saddles to make it easy to identify the birds at a distance. The saddles caused no harm whatever and several can still be seen now, six years later. Purpose of the study was to find out about population status, distribution, survival rates and behavior of a flock of city mallards.

Observation of these marked individuals over the course of the next several years showed a yearly adult survival rate of about 80%. This is 20% higher than for wild ducks. But the higher adult rate appears to be offset by lower duckling survival. Ducklings succumb to hazards like traffic, curbs, sewer grates, children, and predators such as snapping turtles, large fish and domestic pets.

When Madison lakes freeze, the ducks congregate on whatever open water remains—the Madison Gas and Electric Company outlet on Lake Monona, the spring fed duck pond in the Arboretum, and the Yahara River. On exceedingly cold days they remain on or near these water roosts all day long. It's believed this is because the energy required to move around and feed in the cold exceeds the energy which can be gained from nutrition. However, on warmer days the ducks disperse to feed in such diverse areas as farm fields and backyard bird feeders.

The study revealed very little interchange with other wild populations. One duck was shot by a hunter in the fall of 1978 near Fond du Lac. We also have reports of marked individuals nesting and successfully rearing broods as far south as the lower end of Lake Waubesa and lower Mud Lake east of McFarland. However, the great majority are born, bred and stay inside the Madison city limits.

In spring, ducks that found a mate during winter look for a nest site. The choice ranges from normal to bizarre. Usually thought of as upland nesters wild mallards normally build in thick vegetation near water. Some of their city



Nasal saddle used for identification.

cousins still do, particularly in the Arboretum where habitat is available. But others adapt. They nest under porches, in shrubbery around homes and other cozy spots. A few go ape. One recently nested on the roof of a 12 story building in Milwaukee. Not long ago a mallard hen brought off a brood in a planter on the UW-Madison Mall.

When eggs hatch, the hen leads her brood to water. This annual event is a unique people pleaser. It is not unusual to see a group of concerned citizens escorting a newly hatched brood to safety. The escort stops traffic, lifts ducklings up or down stairs, herds them around open sewer grates and generally furnishes careful protection from all the hazards of civilization. It's a wildlife experience people enjoy and remember.

But city life isn't all duck heaven and a daily ration of panhandled Wonder bread. Ducks create problems and people gripe. Complaints usually center on fear of pollution or on the mess ducks make when they defecate on boat docks, boats, picnic tables, residential lawns and other loafing spots. At the Arboretum there were so many birds they began to wear down the shoreline and enlarge the duck pond. It had to be riprapped with boulders to prevent further erosion. Water pollution by ducks, however, is not serious. Studies of large concentrations of geese on Wisconsin waters found their contribution of pollutants like phosphorous to be insignificant compared to farm and urban runoff.

The state often receives calls from concerned citizens who want the birds fed in winter. However, in nearly every case plenty is available. Many people put out feed regularly at various duck hangouts or on their own property. Natural food is also available for all but the coldest periods. Birds easily find windswept stubble and feed at the edge of the city. We have no reports of ducks actually starving in the Madison flock. However, some were examined during the severe winters of 1977-78 and 1978-79 that were very skinny.

The public also worries about the aggressive harassment a hen receives from waiting drakes when she leaves the nest with a newly hatched brood. In the wild, duck sex ratios are usually unbalanced in favor of males. This excess of males is a ready source of breeding stock if a hen looses her eggs and remates to produce another clutch.

In the wild, drakes would normally have departed already for secluded areas to molt, when hens bring their brood to water. But in the city, they stay put and when a hen leaves the nest, she has to run a gauntlet of lusty drakes, all of whom are very persistent in wanting to mate. As a consequence, she can't be as attentive to her brood as a wild hen. This may be one additional cause of lower duckling survival in city flocks.

A problem of real concern is the threat of disease. As concentrations of waterfowl increase,this risk does too. And non-migrant city birds receive no benefit from seasonal dispersal as do wild ones, the transmission of disease and buildup of internal parasites is favored. The most serious threat is duck virus enteritis, or duck plague. This could devastate a city flock, and even be transmitted to wild migrants in spring or fall.

Although these problems exist, city ducks are fun and people like them. Chances are good they'll remain a permanent part of the so called urban wildlife community. Biologists, therefore are watching with tolerant but careful concern. These flocks will have to be understood and managed. We don't dare let them become intolerable pests or a danger to their country cousins.

Cords and boards and recreation

Each compartment in the Northern Highland-American Legion State Forest has a plan and it's all computerized. Push a button and out comes timber. Or maybe a ski trail.

VIRGINIA SHAKER LEITH, Lakeland Times, Minocqua

The Northern Highland-American Legion State Forest (NH-AL) consists of more than 200,000 acres in parts of Vilas, Oneida and Iron Counties. It does what a good state forest should—provides outdoor recreation for every taste. If you ski, hike, hunt, fish, snowmobile, gather nuts, pick berries, watch birds or just like wilderness and nature, NH-AL is your kind of place. This is called multiple use and part of its philosophy includes timber management.

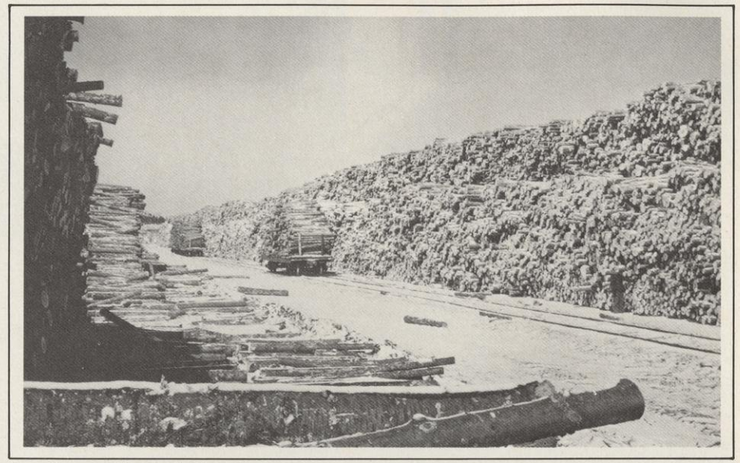
Each year, 30,000 cords of pulpwood and 1½-million board feet of logs are harvested. Yet visitors and even local residents hardly know it's happening. Management of recreation, watersheds, wildlife, outdoor aesthetics and forestry all happen in harmony.

Ralph Hewett is the chief forester and his staff includes three other professionals, Don Burr, Bill Wood and Dean Farr. They're helped by two technicians, Roger Reader and Jack Henke.

Hewett says the key word in current timber management on the forest is "reconnaissance." Under it, the forest is divided into compartments in which the characteristics of each and every timber stand are recorded and computerized for management purposes. Northern Highland-American Legion has 385 compartments.

Hewett compares the forest to a "series of communities that can be identified, just as neighborhoods in a city can be identified. Each community has special characteristics and requires special management which will best suit that resource and its regeneration."

The ideas behind reconnaissance were formulated in the 1950's and field work began in the 60's. All compartments were photographed from the air. On the ground, each timber stand on each compartment was analyzed by volume and age and given a site index, which indicates vigor and growth. Topography, soil type, recreational possibilities, wildlife habitat, deer yards, presence of disease and other relevant characteristics were recorded. Then management objectives for each timber stand were formulated in an on-site evaluation. Production or other goals for each stand were set.



State forests help supply the mills. Photo by David Thompson

In the early 1970's, all this information was punched into a statewide computer system. Now in the 80's comes the payoff. The computerized system gives instant information on which timber stands should be harvested, need planting, require thinning, release or other improvement, have insect and disease problems or need attention of any kind.

Based on this computer data, a 10-year statewide cutting schedule was created. Economics, aesthetics, and markets all affect and may alter the schedule. Built into it is the important concept of sustained yield—production of a steady supply of wood products from now until forever.

Timber management is circumscribed by nature, but on state forests, its prerequisites are modified to give people the kind of woods they like. For example, in 1974, responding to an expressed public preference for big trees, former Governor Patrick Lucey ordered that certain species not be harvested at the scheduled time, but be allowed to keep growing. Red and white pine, northern hardwoods, hemlock and red oak are the species involved.

A number of other management practices help maintain forest aesthetics. Uncut reserve strips keep the landscape pretty—100 feet wide along town roads, 200 on lettered or numbered highways and 300 feet along shorelines. Ridges also get special treatment—strips 120 feet wide are left to prevent erosion and to preserve the look of the forest after a cut.

Where recreation is of prime importance, logging is limited. Before any job begins, Chief Forester Hewett first checks with the recreation supervisor. The public user who wants an outdoor experience always receives top priority.

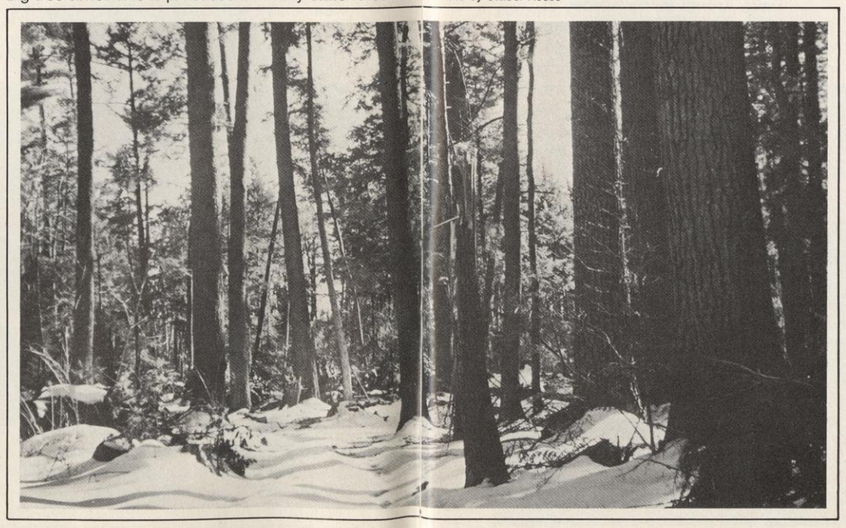
Likewise, the area wildlife manager is consulted. Often, logging is beneficial to animals. New openings stimulate food growth and slash provides cover. Deer and grouse benefit.

Hewett visits people whose homes adjoin land to be logged whenever possible. He explains the logging operation and answers questions. The large number of absentee landowners sometimes makes personal contact difficult but to compensate Hewett maintains an "open door" policy at his Trout Lake office. People with timber management questions are urged to stop by or give a call.

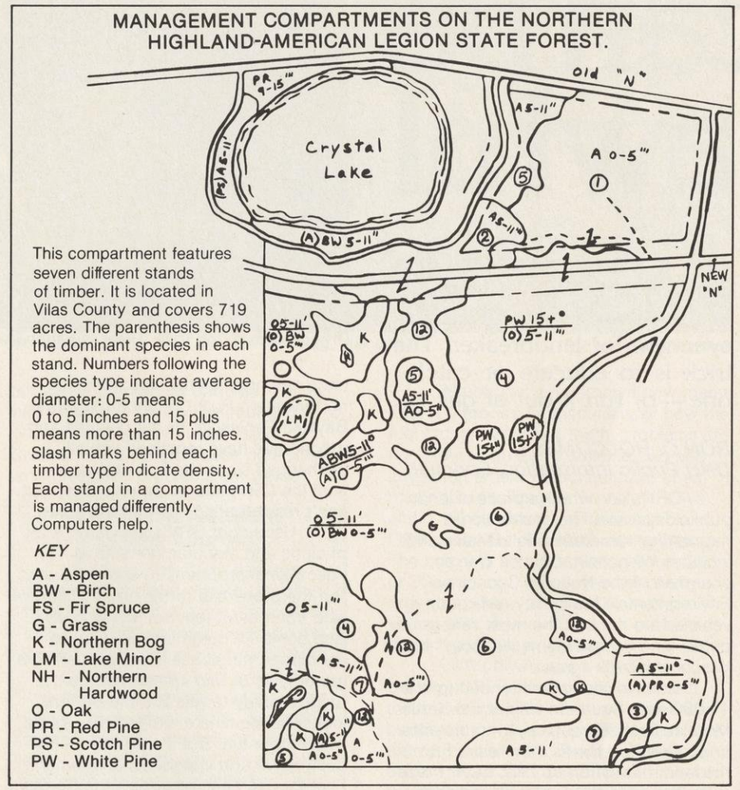
Three basic cutting methods are used in Northern Highland-American Legion: selective harvesting, thinning and clear cutting.

Northern hardwoods are managed through selective harvest. In this method, all poor trees of merchantable size are removed as well as any mature or over-mature ones. Removal is accomplished through a series of partial cuts at 8 and 15 year intervals. A well stocked and growing stand is maintained on the site and eventually it regenerates itself.

Big tree silviculture is practiced on many state forests. Photo by Staber Reese



MANAGEMENT COMPARTMENTS ON THE NORTHERN HIGHLAND-AMERICAN LEGION STATE FOREST.



This compartment features seven different stands of timber. It is located in Vilas County and covers 719 acres. The parenthesis shows the dominant species in each stand. Numbers following the species type indicate average diameter: 0-5 means 0 to 5 inches and 15 plus means more than 15 inches. Slash marks behind each timber type indicate density. Each stand in a compartment is managed differently. Computers help.

KEY

A - Aspen
BW - Birch
FS - Fir Spruce
G - Grass
K - Northern Bog
LM - Lake Minor
NH - Northern Hardwood
O - Oak
PR - Red Pine
PS - Scotch Pine
PW - White Pine

The two species thrive only in full sunlight. Management regenerates jack pine through planting, discing, fire, direct seeding or by leaving a few seed trees. With aspen, root suckering is used—direct sunlight stimulates small buds on the root to produce a new tree. Clear cutting gives best results.

Before selecting the cutting method, many variables must be taken into consideration, but the way to bring new growth heads the list. Regeneration is considered most important.

Through judicious management by foresters like Ralph Hewett, one of Wisconsin's greatest resources is perpetuated and utilized.

Hewett's management philosophy is guided by two imperatives: regeneration of the forest and sensitivity to the needs and desires of the public.

He sums it up this way:

"The Northern Highland-American Legion State Forest belongs to the citizens of Wisconsin. It's the finest outdoor recreation complex in Wisconsin. It is also a prime producer of timber products. These values depend on the trees. Management is designed to perpetuate both, with both subject to modification based on the owner's requirements." □

Management through thinning is for pine stands. These are intermediate cuttings that take place before the major harvest. Thinning gives the remaining trees growth room.

The clear cut system is for aspen and jack pine. In nature, even-aged species like these usually originated at the same time because of fire. With management, clear cutting takes fire's place. Objective is to remove the canopy and expose the forest floor.

ORV's can be awful

ORV damage in Dog Town Creek in Barron County.

ORV is the acronym for Off Road Vehicle. With a violator in the driver's seat, it's also a synonym for landbreaker. The trick is to educate or catch one—or run it out of gas.

RON C. HOLCOMB,
DNR Public Information, Spooner

ORV's can wreck a piece of land, public or private. The destruction is happening from California to Maine and includes Wisconsin. Charles Warren, chairman of the National Council on Environmental Quality says off-road vehicles are "one of the most serious public land use problems we face." In Wisconsin, DNR agrees.

Ron Novak, superintendent of the 17,000-acre Southern Unit of the Kettle Moraine State Forest, says motorcycles and four-wheel drives mercilessly hurt the land. "They run up hills, travel horse trails and even drive through wetlands. We've dug trenches, bulldozed barricades and put up gates, but the problems haven't gone away."

In northeast Burnett County on the Namekagon Barrens, ORV's have dug ruts five feet deep—scars that will last 100 years. "Dealing with ORV's takes the fun out of being a wildlife manager," says Pat Savage, who does that work for DNR in Burnett and Washburn Counties. "We have to spend time installing signs and gates and apprehending violators. Last summer ORV enforcement used up 100 hours just on the Barrens. This is time wasted that should be devoted to managing the land."

The Namekagon Barrens are among the last remnants of an immense semi-open stretch of sandy soil that once extended all the way from northwestern Polk County through the Bayfield Peninsula. Its flat uplands and rugged hills have remained virtually unchanged since the first explorers—until the ORV, that is. Some drivers just can't resist tearing the Barrens apart.

Used right ORV's are okay. A lot of clubs and manufacturers have educational programs to show the way. But the proverbial rotten apples, the few who don't care, foul the rest who do. And some TV commercials seem to encourage the abuse. On TV, pushing a motorcycle or four-wheel drive across rugged sandy terrain like the Barrens, looks like legitimate excitement—good wholesome fun. But it's terribly destructive and impedes management. Fire, for example, maintains the Barren's shrub prairie, and helps sharptail grouse habitat, but Savage hesitates to use it for fear of giving the machines new open space to wreck.

Driving a motorcycle or any other vehicle along the shoulder or ditch of any public road in Wisconsin is against the law. Anything operating within the right-of-way of a federal, county, town, municipal or local park road is subject to almost all traffic laws including speed, direction of travel and registration.

Savage also combats ORV's at Beaver Brook Wildlife Area near Spooner. Although primarily forested, ORV fanatics still manage to charge over the trails and dig enormous ruts and gullies that turn into serious erosion problems. Recently, their ravages forced Savage to gate off three access trails. But the gates have been repeatedly torn down and a continuing battle goes on to keep them in place.

ORV violators have one big advantage over the good guys. They're hard to catch. To some, it's a contest. DNR officials are quick to admit they have trouble nailing ORV landbreakers.

Dave Arendt is the warden in Florence County where ORV's caused extensive damage to Spread Eagle public hunting ground and the shoreline of the Pine and Popple Wild Rivers. "If they see us or know we're in the area (many are equipped with CB radios) they can just take off. They know we can't pursue over rugged terrain in our cars," says Arendt.

At the Kettle Moraine, Superintendent Novak says it would take a concentrated effort to effectively combat the problem. "We just don't have the money that would be needed to crack down."

State properties aren't the only ones with ORV problems. The Nicolet

and Chequamegon National Forests comprise nearly 2-million acres in northern Wisconsin,and U.S. Forest Service officials are concerned. Both forests have regulations governing use of ORV's, but the rules are difficult to enforce because of vast acreage and miles of road. On the Nicolet, Terry Moore is troubled by the ORV's that invade eagle nesting territories. Fortunately, in the Chequamegon, few problems are reported except during wet weather in the fall.

But elsewhere ORV drivers are not only tearing up public land, they're into private land as well. Charles Rumsey owns 200 acres of Namekagon Barrens in Burnett County but only spends six to eight weeks a year there. He began having problems in the late 1960's. "They were actually holding rallies on my land. I've put up deep post barricades and signs, but the posts have been pulled out and the signs either disappear or get shot up." Rumsey feels helpless even though local law enforcement officials are aware of the problems. "I hope the worsening gas situation puts enough social pressure on these individuals to make them stop driving off-road vehicles," he says.

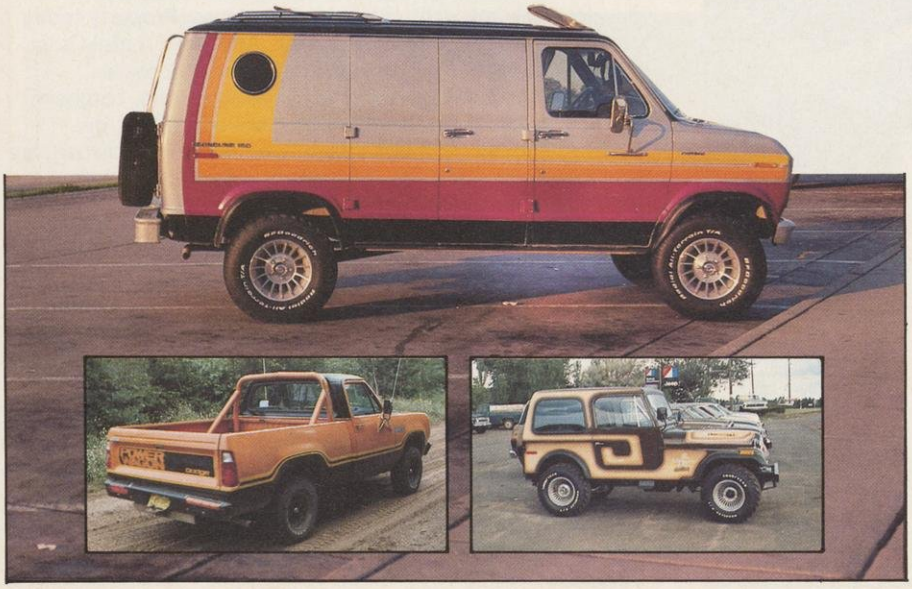
Private landowners, especially absentees like Rumsey, find themselves in the same predicament as public land managers: it's difficult if not impossible to catch the violator. Local law enforcement officials have to be notified and signs, fences or gates erected. One landowner, who discovered signs weren't enough, even placed an ad in a local newspaper warning against trespass on his property.

Even if abuse is finally stopped, the scarred lands are slow to forgive. Where top soil is thin or light, like the Barrens or Spread Eagle, constant use can cause permanent damage. "It may take 100 years for a vegetational mat to form in these sandy areas," says Savage. "And, where abuse persists, serious erosion problems get worse."

ORV-abused glacial sand dunes at Newburg, Wisconsin. Photo by David Thompson

ORVs Hit Aztalan, Gates Closed

Because of ORV damage to ancient Woodland Indian Mounds, DNR has closed Aztalan State Park near Lake Mills to vehicular traffic this winter. Gates will stay up until April 12, but visitors on foot will still be welcome. The action came after ORVs dug deep ruts in many archeologically important mounds and vandals destroyed parts of the historical display. Lawbreakers who caused the damage were not caught.



Although it's not known how many ORV's there are in Wisconsin, or how the fuel crunch will affect them, problems are not likely to go away. Wildlife, fish and law enforcement personnel have spent many hours talking to four-wheel drive clubs. All condemn the irresponsible ORV driver. But the clubs are helpless. The culprit is usually a young adult, 20 or 30 years old, not a member of any organized club. "It's hard to impress young ORV drivers about the problems they create," says Savage.

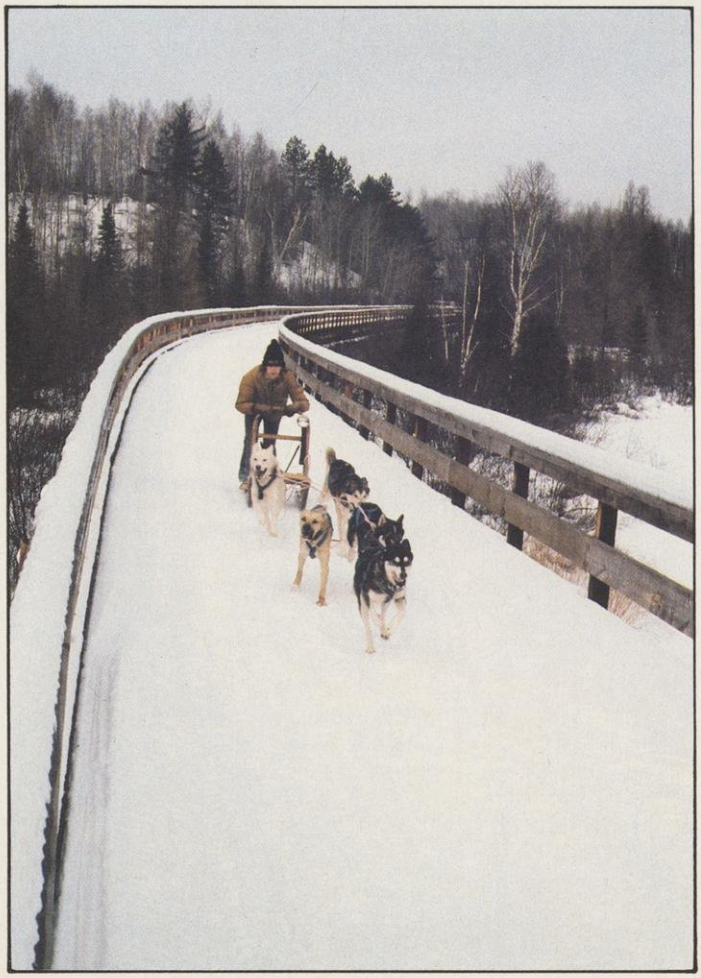
DNR officials don't advocate banning ORV's from public lands, but they're worried. Strict enforcement may be the only way to stop destruction, and patrols cost money. The most effective solution is for ORV users to learn about the abuses and then police themselves. It won't be easy, especially with mechanized off-road acrobatics reinforced and encouraged by all that television and magazine advertising. The AMC Jeep people and some others have recently given it some attention. Maybe after a while problems, as well as fun, will start to get space in the ads. In cooperation with the Outdoor Writers Association, Jeep has also developed a creed that should be a reminder to all who intentionally drive off the road:

"I will appreciate solitude and the beauty of our natural environment and respect the feelings of others toward it—I will not drive near to, or chase, or disturb any animals and I will not drive where I cannot leave the land essentially the same as before I found it."

These are good words. We're all waiting for them to really happen. □

the promised land

Bridge at Copper Falls State Park. Photo by Jim Escalante



Wisconsin's Outdoor Recreation Act Programs (ORAP) of the 1960's and 70's have nearly fulfilled their promise. But there's a 300,000 acre short-fall. What to do?

DICK STEFFES,
DNR Bureau of Real Estate, Madison

It used to be a lot cheaper. Around 1912 wild land in northern Wisconsin cost $2.50 an acre. But now! DNR pays anywhere from $150 in the north to as much as $3,500 per acre in the southeast where wrestling land away from developers is a touchy, expensive business. Property today can go up as much as 18% a year. And while there's a lot of public land, in some places recreational pressure squeezes the fun right out of it. Hunters, anglers, campers, snowmobilers, skiers, wildlife observers and others get jammed into less and less space. On private land, owners are posting. Understandably, they want to keep their quiet natural retreat to themselves. Last fall, for example, I drove through the Township of Lewiston in Columbia County during deer season. Heavy crop damage by a big whitetail herd had prompted liberal regulations to attract hunters, but the sign merchant made the killing. Crowds of cars roved the roads looking for an unposted place. But "No trespass" on blaze orange or white stared them all down.

There were crowds in state parks too—8.5 million visits in 1978 as compared to only 2.1 million 10 years ago.

Left:
Bearskin Trail in Oneida County. Purchased and developed for $480,000, two-thirds came from ORAP. Photo by William Hoppe

A recent UW-Madison survey shows that 44% of Wisconsin citizens fish, 19% hunt and 82% picnic or walk through public parks or along waterways.

Crowds are only one of the pressures that define the remarkable price boom in land. Today the public demands that its public property be located near home. Urbanization, leisure time and the energy crunch are why. So DNR now buys land in the south and southeast where population is heaviest, prices highest and competition from developers, investors and other private buyers toughest. Sometimes competitors win out.

Today's prices also reflect the trends of history. State land purchase for recreation began in 1876 with 40 acres to build the Nevin Fish Hatchery just south of Madison. The cost was $1,395. Nevin is still a DNR hatchery. In those days,land and water for hunting, fishing and other recreation was no problem so public policy concentrated on other things.

Agriculture grew in the south and loggers invaded the north. Virgin pineries were clear cut and wilderness fires like the infamous Peshtigo roared. The "plow followed the axe," sometimes on land best suited for timber. Those farms failed. By the early 20's the forest industry had collapsed and hundreds of thousands of acres of ash and stumps were tax delinquent.

But management brought it all back. Today about 43% of Wisconsin is forested with 2.3 million acres owned by counties (2½ times more than is managed by DNR). A state forestry fund, approved in the 20's by referendum, became a part of the constitution. The money source for it is two-tenths of a mill tax on real estate (about $6 on a $40,000 property) and use is mostly for fire control but also for forest operations and to buy some land. These dollars financed rebirth of the forest industry and created the landscape that made Wisconsin tourism thrive.

Most DNR administered land is in the north, acquired in the 20's or 30's when land was often viewed as a surplus commodity by big loggers. To give you an idea of prices, in 1912 the state purchased 36,500 acres in Vilas County from the Yawkey Bissell Lumber Company. Price: $2.51 per acre. That property formed the nucleus of the Northern Highland State Forest, and today is a recreational mecca for the entire state.

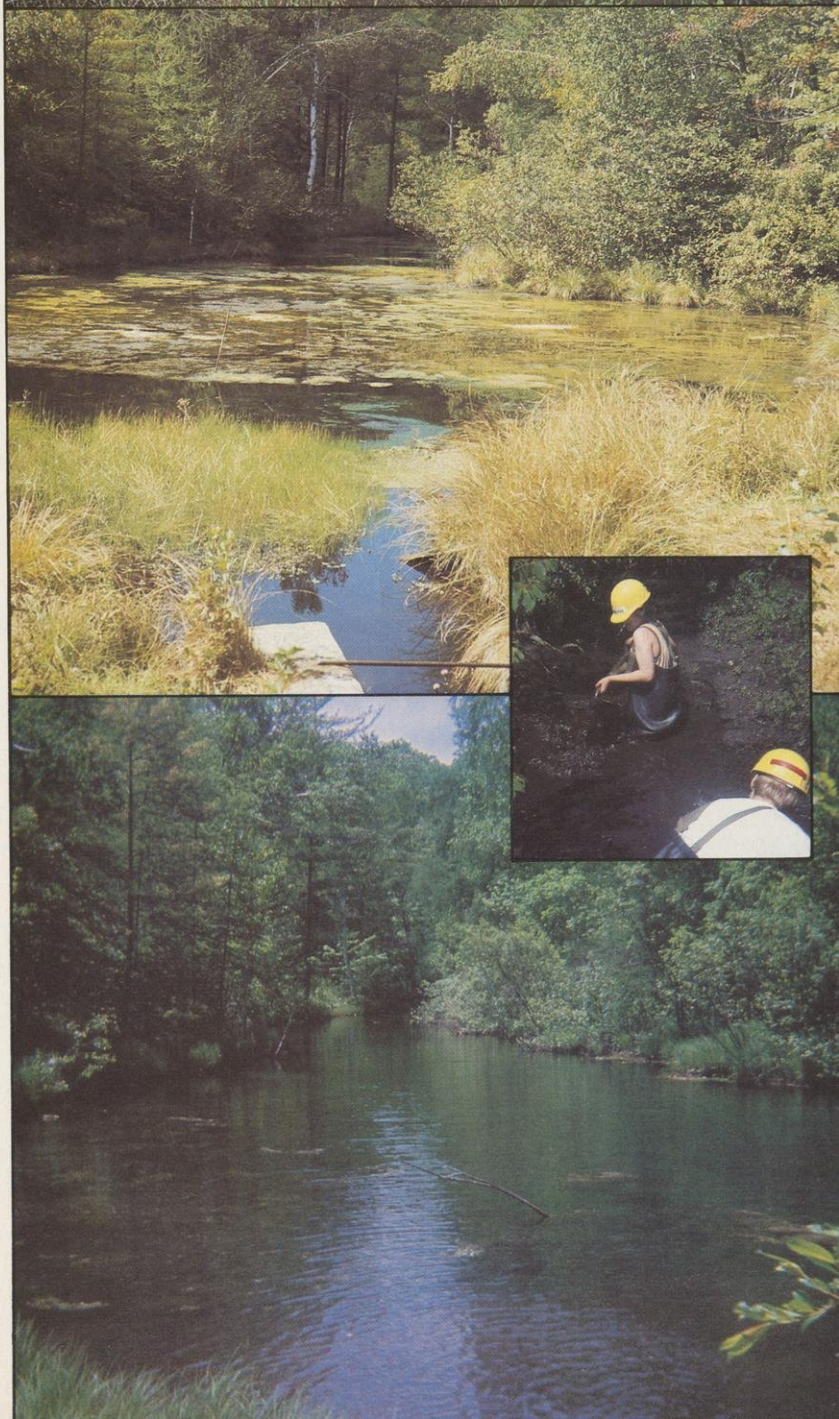
Even though the days of dirt cheap land are gone forever, they're not long gone. Look at these recent figures on three successive trail projects:

In 1966, DNR purchased 485 acres from the Northwestern Railroad for the 32 mile long Elroy-Sparta trail, the first major recreational trail in the country. Cost: $12,000.

Six years later, in 1972, 264 acres were acquired from the Milwaukee Road for 23 miles of the Sugar River trail in Green County. Cost: $74,000.

And by 1979 when another 294 acres were purchased from the Northwestern Railroad the price had risen spectacularly. It involved only 20 miles, from Medary Junction to Fort McCoy in Monroe and La Crosse counties and the cost was a whopping $282,000.

Despite relentless price increases, public support for the state land program continues unabated. Often it's very specific and personal. For example last summer a piece of



Top right:
ORAP paid for numerous cattle crossings to help protect trout streams from erosion. Cost: $2,000 each. Photo by Jim Escalante

Center and bottom:
Spring pond dredging to improve brook trout production. These are before and after pictures at Millhome Creek in Manitowoc County. Typical cost; $18,000. Many spring ponds were ORAP projects. The inset shows summer youth camp workers helping with stream improvement. ORAP built five youth camps at about $400,000 each. Photos by Dave Hanson

land in Oneida County was appraised for $18,000. The owner was asking $20,000 and had started a subdivision survey in case DNR failed to meet his price. By law the state is locked into paying no less than appraised value and by policy almost never pays more. But one neighbor didn't want any new subdivisions. He donated $2,000. The land is now public property. In another case involving trout water and virgin white pine, a state offer of $134,000 was several thousand short of bids by two logging companies. In a sentimental way, though, the sellers wanted to see their land preserved. They sold to DNR and took the loss.

Sellers happy

U.W. researcher Anne Jablonski contacted 195 persons who sold land to DNR in recent years: 95% strongly approved of the department's plans for use of their former property; 98% felt they received a fair price; and 99% said the state negotiator was courteous and did not pressure them.

And private donations to DNR's public land program are legendary. Many of Wisconsin's most treasured outdoor recreation spots were gifts from individuals or corporations. They include the Brule River State Forest, the Mead Wildlife Area, the St. Croix River State Forest and John Michael Kohler State Park.

Altogether more than 100,000 acres of outdoor recreation lands have been gifts to the people of Wisconsin. Each gift is a special event to the Natural Resources Board whose members realize that such land is also very special to the donors. This sentiment is acknowledged in the review and acceptance of every parcel, no matter how big or small.

All the public land administered by DNR adds up to about one-million acres. This is only 2.7% of the state's area. By comparison Minnesota has 10% and Michigan nearly 12% under DNR control. The Wisconsin land is located in 600 different outdoor recreation areas. Acquisition on many is already complete. For those that aren't, the total shortfall is 300,000 acres. These will be high priced!

Taxes

Property acquired by the state is removed from the tax rolls. When this happens, local tax units DO NOT lose revenues. Instead they are compensated almost penny for penny. Some units even come out ahead! Since public land is enjoyed by the whole state, the whole state shoulders the tax burden. A pamphlet on payment in lieu of taxes is available at DNR offices.

Another expense is development, some form of which must be undertaken before the public can make use of most properties. Roads, trails, picnic areas, beaches, interpretive centers and sanitary facilities have to be built. Each property has its own requirements. For example, the MacKenzie Environmental Education Center near Poynette and four other youth conservation camps give young people outdoor education and experience. Stream bank and trout habitat improvement and public access to lakes and streams come

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Top left:
ORAP tennis courts at Shell Lake in Washburn County. Average cost: $10,000 per unit. In the past two years, 39 Wisconsin communities built ORAP courts. Many consisted of up to eight units each. Photo by Jim Escalante

Center:
ORAP paid for several state park visitor centers. Each building cost about $50,000.

Bottom left:
The ORAP swimming pool at Blue Mounds State Park. Cost: $397,000. Photo by Jim Escalante

from fish management acquisitions. The hatchery at Bayfield contributes stock to the Great Lakes. More recreation trails and parks are in the works. Most land acquisition for Lake Mendota State Park near Madison was completed last summer. New waterfowl flowages are planned as well as new scientific and natural areas and additional wilderness purchases.

For some projects, outright ownership is not needed. Where easements work, the private owner retains the land but the public buys certain specified rights. DNR's most common easement is on trout streams where public use is permitted a certain distance from the water's edge. Usually the department is also allowed to stabilize the stream bank and improve habitat. Scenic easements, in which the landowner cannot develop, dump wastes or cut trees are also common.

During the past 18 years all this purchase and development has been reliably funded, mostly by a program called "ORAP." It began in 1961 when the legislature passed the Outdoor Recreation Act Program (ORAP). Main financial feature was a one cent tax on cigarettes. Senator Gaylord Nelson, who was then Governor, furnished the leadership. Later, in 1969, after receiving citizen endorsement in a statewide referendum, ORAP 200 passed. This authorized $144 million in bonding for clean water projects in local communities and another $56 million for outdoor recreation. Because of ORAP, Wisconsin has been able to cash in on several different federal fund programs available for recreational land purchase. About $4-million of federal money per year is involved and usually state matching money of 25 to 50% is required. ORAP provided the matching wherewithal and much land in many of our most popular parks was purchased with this federal-state funding combination.

Strict procedures

Strong internal rules govern DNR land acquisition. A staff of highly trained negotiators and appraisers do the work. State and federal laws require that owners be paid full market value. An offer is made based on appraised value, and if the owner accepts, approval must be given by the Natural Resources Board. Anyone displaced is given compensation to pay for a move and help find adequate housing. In some cases, land is leased back so that people have time to relocate. Most transactions, however, are for raw land. Sometimes share cropping is arranged with local farmers where needs and land quality allow. DNR's power of eminent domain (condemnation) is very rarely used—less than once a year in the past 10 years.

ORAP also features so-called "formula" dollars, appropriated from the state general fund. These pay off the bonds, help with park operations and go to local government to help make up losses in property taxes when the state buys land. ORAP formula also contributes about $1-million per year to local governments for local recreation projects. Hometown parks all across the state have flourished under these grants. If a trail, tennis court, baseball diamond or even swimming pool was built in your neighborhood in the past few years, chances are ORAP helped foot the bill. For example, Racine renovated a bath house, West Bend built a hockey rink, Tomah built a boat dock and Fond du Lac used a grant for park development.

In 1969, the idea of borrowing $200-million for clean water and outdoor recreation worried a lot of people. But it turned out to be good economics. As predicted, inflationary pressures raised prices. Bonds and all, the public came out far ahead. Today, $200-million would be a modest amount for a big state job. By comparison, Wisconsin's Veterans

ORAP canoe launch sites cost $3,000 each. This is at Governor Dodge State Park. Photo by Jim Escalante

mortgage loan program can issue bonds for $1-billion.

And the ORAP 200 philosophy that since future generations benefit, they should also help pay, has proved out too. The 1980 outdoor scene is jampacked with the 10-year-olds of 1969, and their kids will be turning on to new ORAP attractions in the year 2000. But only if the promise is fulfilled and the 300,000 acres still needed can be purchased. As of now, this is in doubt.

ORAP is about to run out of money. Only about $4.6 million in bonding authority remains—enough to last two or three years. Unless funds are replenished, the public land program is in danger. Inflation could put it beyond attainment. There needs to be money to match federal grants, money to continue enrichment of local outdoor recreation and money for state park development.

In response to these needs, DNR Secretary Anthony Earl has appointed a blue ribbon committee to explore future funding possibilities. The committee is chaired by former Governor Warren P. Knowles who led the battle for passage of ORAP 200.

Ever since May of 1979 Governor Knowles' Committee has been working on alternatives. Out of these sessions will come a report on:

1. How much more land is actually needed.
2. Where and what kinds of land should be acquired.
3. What the role of the private sector should be compared to the various units of government.
4. How much development is needed.
5. And where the money will come from.

The report is due any day now. Its recommendations, the DNR response and the legislature's action on it will shape Wisconsin's landscape for decades to come. If all goes well, the promise of ORAP in the 60's and 70's may come close to fulfillment in the 80's. □

Wisconsin's Hazardous Wasteline

Photo by Tim Krueger

Some call hazardous waste the "gross national by-product." Wisconsin's share is more than 300,000 tons per year. It's dangerous and there's no safe place to put a lot of it. Even safe, nobody wants it.

LARRY SPERLING,
DNR Public Information, Madison

About the best way short of murder to grab a headline today is to mention hazardous waste.

Not since the "BLOB" and "The Green Slime" oozed across drive-in screens have more people envisioned the "horrors" of hazardous waste on the loose. Yet these same people will stop at a gas station on their way home, fill up the tank with "hazardous" volatile liquids, wipe another hazardous substance across a dirty windshield and pour a quart of it into the crankcase without blinking an eye.

Some hazardous waste is extremely poisonous and can kill you even if you're exposed only once, but the great majority comes from products we use daily, from industrial products and goods and services we demand. Gasoline, household cleaners, plastic toothbrushes, vinyl floor tiles, TV tubes, electronics, cigarette lighters, molded plastics, chrome hubcaps and deodorants all contain or were made with hazardous materials.

Hazardous waste is made every time you have your clothes drycleaned, flush out your car radiator, paint your house, throw a light switch, buy a record, pull on a nylon windbreaker, pantyhose or anything synthetic. There are hazardous by-products in most cosmetic, pharmaceutical, chemical and electric products you use.

Furthermore, cleaning the water we drink and the air we all breathe filters out large quantities of these materials that have to be disposed of daily. Some of the filtered particles are hazardous.

The point is, nobody started out to intentionally make hazardous waste, but we all use and demand products that produce it—up to 52 million tons yearly in the US, according to Environmental Protection Agency (EPA) estimates. EPA has dubbed this stuff our "Gross National Byproduct."

Certain materials are hazardous because with routine care and handling they significantly increase the likelihood of serious illness or death. Hazardous waste is material which when thrown out may threaten human health or the environment if improperly treated, stored, transported or disposed of.

What kinds of things can significantly threaten your health? Wisconsin will follow federal guidelines which outline the nature of hazards. Basically, they can be:

- *Ignitable—Lit or spontaneous fire hazards. Petroleum products and solvents are examples.*
- *Corrosive—Compounds like acids or bases that can burn or harm skin on contact. They require special containers.*
- *Reactive—Things which have violent chemical reactions with water, air or other materials, readily react with gases, or can't be bumped or shaken because they'll explode.*

•*Toxic—Poisonous to human health or the environment, cause genetic change, and accumulate in body tissues. Many industrial compounds and commercial chemicals can be toxic if workers or consumers are exposed for a long time. Pesticides, cleaners, and chemicals that seem safe can cause health problems for people who handle them regularly.*

Not all hazardous wastes are toxic but toxic compounds are probably the most dangerous hazardous substances there are. Some can be used and handled for years without any noticeable problems. Many are colorless and odorless. We don't know much about the hidden long-term consequences.

In 1978 in response to nationwide worry about improper chemical waste dumping at Love Canal in Niagara Falls, New York, many wondered whether wastes were being handled any better near their homes. In Wisconsin, state legislators directed DNR to conduct studies. The first, "The Current Status of Hazardous Waste Management in Wisconsin," was a survey of existing files and permits. It covered only industry. Right now there is no good way to estimate how much hazardous waste is generated by cities or in homes. Amounts though are probably smaller as compared to industry.

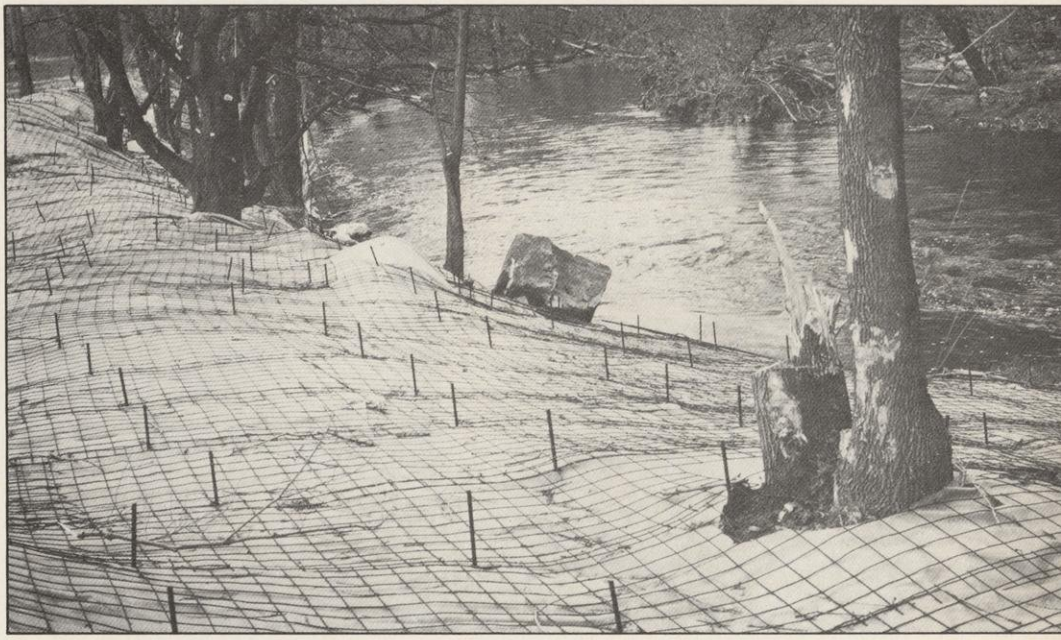
Fortunately, not all hazardous waste is created equal. The waste Wisconsin industries produce is generally less hazardous than that of chemical, auto manufacturing and steel mill industries elsewhere.

Here,paper mill sludges, foundry wastes, electric utility ashes and particles trapped in air pollution control equipment are the biggest culprits. These 2.55 million tons of "special" wastes produced in Wisconsin contain extremely low concentrations of hazardous material spread through large volumes of stable, inert sand, ash, clay particles and wood fiber. Because the hazardous component is such a small fraction of the total, there is little chance that such material will contaminate the environment. Such residues can be safely deposited in a well run sanitary landfill.

About 64,000 tons of plastic, resins and wax waste are annually disposed of in the state. These can be hazardous if not carefully handled, but they don't threaten the environment very much. Mostly inert, they don't decompose like garbage and plant material. Buried plastic remains buried plastic for many years, impervious to weathering and wear.

TOXIC METAL WASTE

	Generating Industries
Lead	- Paint and dye, electrical and electronic
Arsenic	- Phamaceutical, printing and duplicating
Mercury	- Pesticide, paint and dye, rubber and plastics
Copper	- Electroplating and metal finishing, textile, paint and dye
Cadmium	- Battery, electroplating, mining and metallurgy
Chromium	- Leather, electroplating, chemical manufacturing.



The shoreline of the Sheboygan River was covered with a special mesh last winter to prevent erosion of PCB-contaminated soil. Tecumseh Products Company has removed 106,000 cubic feet of soil under DNR order to make the site safe again. The firm had dumped sweepings from its engine manufacturing process along 500 feet of shore.

Stuff that's obviously hazardous—acids, battery wastes, caustics, metal wastes, solvents, pesticides, and chemicals—amount to 318,000 tons per year in Wisconsin. DNR tries especially to track these early in the waste management program because of the danger involved.

Prior to the national awakening, hazardous waste disposal in Wisconsin was a matter of economics. The cheapest method was considered the best. Other states facing this same dilemma have uncovered their own Love Canals, found secret pipelines seeping into waterways and other bad things.

DNR estimates that 90% of the 318,000 tons of dangerous waste produced here annually is buried in landfills. Sounds good, but there's a problem: only three sites in the state are licensed to accept such waste and these places get only 24% of the 318,000 tons. The rest is in sanitary landfills not designed to handle it, in open dumps, burned or spread on the land.

An uncertain amount of hazardous waste in Wisconsin is stored or secretly cached. Nationwide, EPA estimates that 90% is not safely disposed of and that industry gets rid of 70 to 80% on its own property, in lagoons, ponds or landfills. Wisconsin has no one specifically assigned to tracking down abandoned disposal sites or dumps. Nevertheless, anonymous tips, records on past industrial production and environmental monitoring can pinpoint problem areas. Actually, DNR has uncovered illegal dumping practices in every part of Wisconsin. Some of these sites may endanger public health or contaminate drinking and surface water. Several hundred illegal dumping cases are on the record. Preventing them is part of the program.

To be safe, hazardous waste landfills must be specifically designed to give land and water long-term protection. The site should also be

naturally secure in case elaborate engineering measures fail. Naturally protective sites have to be located outside any floodplain and need a lot of soil between the bottom of the fill and bedrock. They must also be lined with clay and fine silt soil which can slow down or absorb any wastes that might escape. And they must not drain into surface water or seep into groundwater. In the event of a natural catastrophe like an earthquake, naturally protective sites buy cleanup time for a community because the wastes won't move very far very fast. Sites must be well managed and scrupulously operated to segregate dangerous wastes, protect workers, and in general keep the material under tight control. Even though these sites are expensive to run and maintain, the cost to the environment and society is significantly less than the secretive, indiscreet dumping practices that recently made headlines throughout the country.

In Wisconsin, DNR will take four steps in the near future to manage hazardous waste:

First, a record keeping system will be developed which tracks these materials from birth to final disposal. Once EPA publishes a definition (expected this January) all industries will be required to report on the nature and volume of hazardous waste they produce. They will be given 90 days to make an inventory. This information will tell how wastes are handled now and help decide how many disposal sites Wisconsin needs. The tracking system will consist of a special shipping label or bill of lading attached to containers. Every time the product is used, transported or reprocessed someone will have to sign for it. When the material cannot be used any more and is thrown away, the disposer will sign the shipping history and return it to the original manufacturer.

As a second step, DNR will monitor problem sites. Some of the old abandoned hazardous waste dumps may escape detection but DNR can make pretty accurate guesses on where most are and keep an eye on them. Currently, fish and water samples from major industrial streams are analyzed for signs of contaminants. Through this work, plus aerial surveys, and tips from concerned people who discover old dumps, DNR hopes to find and correct problems inherited from the past.

Thirdly, we will work with industry to develop alternative uses for many materials now thrown away. Many "wastes" can be filtered and recycled or sold to another industry for some good use. A lot of firms in Wisconsin may be tossing money down the drain because they don't know about others who would buy their wastes. DNR will explore the possibility of an informational "waste exchange" to facilitate this process.

Fourth, legislation will be sought mandating development of hazardous waste disposal sites in Wisconsin. They would probably be operated by a public utility or some other public entity separate from DNR.

Perhaps the most "hazardous" quality of hazardous wastes are the political and social concerns they raise. Wisconsin people don't want a disposal site in their neighborhood, village, township or county. Yet they continue to generate tons of these dangerous wastes every year.

There are three privately run hazardous waste disposal sites in southeastern Wisconsin now, but none will accept PCBs, mercury, arsenic, cyanides, large quantities of pesticides, or explosives. These materials, therefore, are being stockpiled and as the stockpile continues to grow, the temptation to secretly dump or flush grows. This prospect should scare us a lot more than proper disposal.

Hazardous wastes in Wisconsin will simply not manage themselves. New ways to reuse these resources and to devise safe disposal methods are not simple or cheap, often not socially acceptable. But the problem has to be handled. If not, one day in the future some horror story none of us will be able to face may emerge! And who wants that? □

EFFECTIVE HAZARDOUS WASTE DISPOSAL

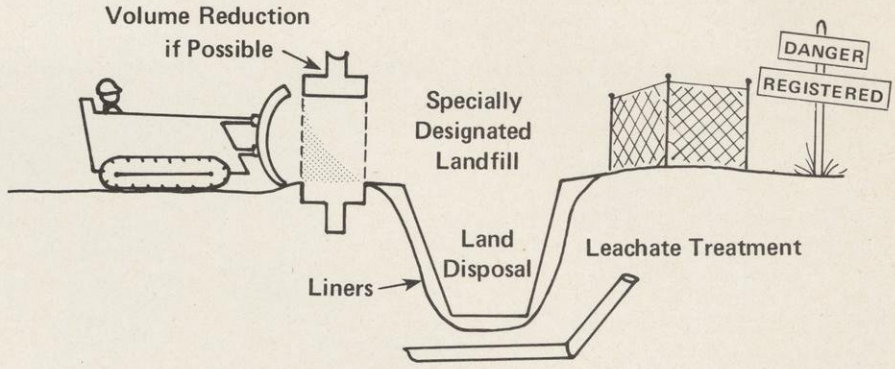
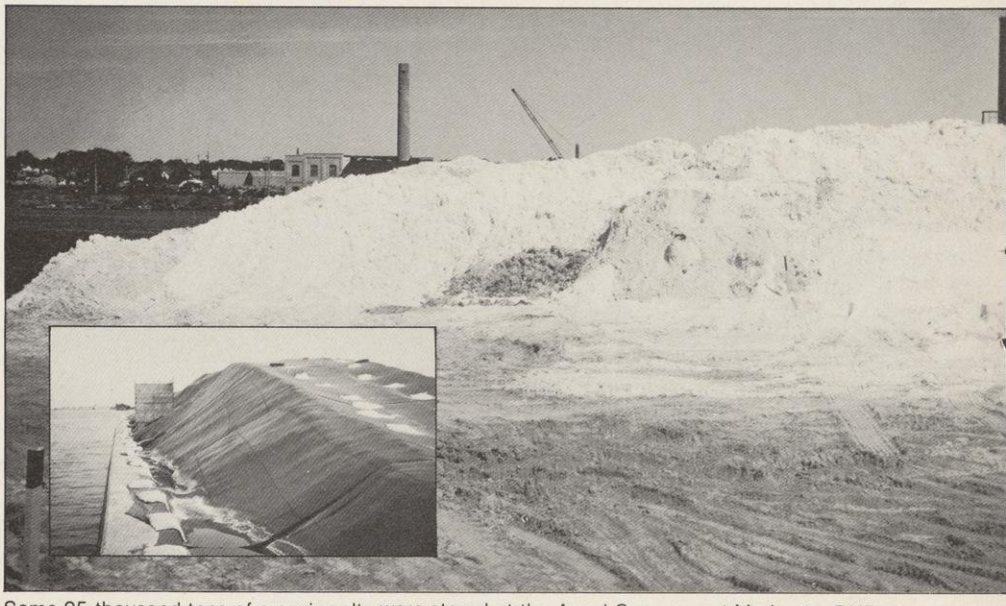


Illustration by Georgine Price



Some 95-thousand tons of arsenic salts were stored at the Ansul Company at Marinette. DNR ordered it covered (inset) and removed. The poison was trucked to a hazardous waste disposal site in Illinois.

Winter navigation on the Great Lakes

A heavy fog of independent governmental jurisdictions and agencies fanned by private interests hovers above the ice. When shipping companies and the Corps of Engineers look into it they see good things. Environmentalists see bad ones. Taxpayers see dollars.

Winter navigation proposes Great Lakes shipping more or less year-round by using icebreakers and other devices to keep locks and channels clear. In 1970 Congress authorized the U.S. Army Corps of Engineers to lead a study that would demonstrate and test feasibility. Total investment for the project would be nearly $1.2-billion; plus interest of $82-million and annual maintenance cost of $30.4 million.

Prior to 1978, the program was not considered controversial. It was viewed as a large engineering project with potential economic benefits for the Great Lakes and the nation. However, in the summer of 1978 the State of New York expressed concern over potential environmental effects. Since that time, concern has become more vocal and more groups are publicly raising questions. What are the potential environmental effects of year-round shipping and who will benefit from it?

If winter navigation is approved, five specially constructed 400- foot icebreaking behemoths would be required plus 17 smaller icebreakers that would also serve as buoy tender vessels. There would be mooring facilities at Superior–Duluth, Sturgeon Bay and Milwaukee. An ice navigation communications network would be established. Harbors, docks and berths would be modified to cope with ice.

An overview

COL. MELVYN D. REMUS, U.S. Army Corps of Engineers

Since the 1800's the Great Lakes-St. Lawrence Seaway system has served two nations as a shipping link with the world. But it was never open year-round.

Prior to the 1960's the season extended from early April to mid-December. Parts of Lakes Erie and Michigan and the Detroit River did limited work through the winter months.

The major obstacle to winter navigation was not ice in the lakes, but the impracticability of handling frozen cargo such as iron ore. Taconite, with a lower moisture content, was developed in the late '50's. It helped eliminate this obstacle.

In 1970 Congress authorized the Chief of Engineers to conduct a survey study and demonstration program on winter navigation.

Continued next page. . .

The idea was to determine the feasibility of extending the navigation season and to conduct related environmental, social, economic, and engineering studies. The actual demonstration was not to be solely a Corps of Engineers effort, but would include federal agencies and non-federal public and private interests. A Winter Navigation Board was set up to conduct it.

The feasibility studies continue today. They compare potential benefits and economic savings with construction costs and environmental and other impacts. At the same time, actual year-round shipping has taken place in the upper four Great Lakes during three of the last four winters under the demonstration program.

Last year a proposed demonstration in a section of the St. Lawrence River was dropped because several important issues could not be resolved before the program was to start. They included liability for damage which may occur to shore property or power plants, possible impacts on levels and flows, Canadian participation, and concerns from the state of New York and environmental groups about the possibility of adverse environmental effects.

During the program, new icebreaking techniques have been studied and demonstrated, and various mechanical devices for keeping shipping channels navigable have been tested.

These devices have included bubblers, ice booms, and steam used to keep lock gates from freezing up.

The demonstration program has now come to an end, and the Winter Navigation Board will submit findings to Congress.

This year, the feasibility study will be completed and sent to Congress for authorization of a permanent project. Cost of the study was about $22.6 million.

Some of the benefits and savings which may be realized by winter navigation are reductions in the cost of stockpiling cargo for the winter, increased efficiency in use of vessels and shore facilities, and reduced net transportation costs.

The employment picture in the Great Lakes region could also conceivably improve by providing year-round rather than seasonal employment aboard ships, at ports, and in ground transportation and other related industries.

However, if extended navigation is to work on a permanent basis, Canadian cooperation is a must.

So far, Canada has been an observer to the United States' study.

Wisconsin has big doubts

Unless the proposal is changed radically the State of Wisconsin will only be dragged into winter navigation by the scruff of its neck. The worry is that the Corps of Engineers has enough clout to do it. A review by all Wisconsin state agencies with winter navigation responsibilities shoots the Corps study full of holes.

Comment on the environment is especially strong. It says that although heavy concern has been registered, the Corps is still "willing to build now and wait to see what happens." The Wisconsin review charges that the Corps promise to "stop" when an impact is noticed "is based on the faulty assumption that the impact would be detectable, reversible and not already permanent."

Agency comment also points out that environmental damage does not happen radically, but is usually a combination of a number of small events, none of which alone would likely ever halt winter navigation. The Wisconsin review accuses the Corps of using the adaptive concept (build now and stop if something bad happens) as "nothing more than a means of getting around the environmentalists and a way of avoiding the full implementation of the required environmental studies."

Here are a few of the other things Wisconsin found wrong with the Corps proposal:

1. Wisconsin would be required to pay its share of the project, but there's no way to determine how many dollars this would amount to. Will Wisconsin have to pay for work done in non-state waters, for environmental studies, for ice breaking?

2. Canada has not yet promised to participate but the Corps assumes it will. If Canadians don't, will the state price tag be higher?

3. Benefit-cost ratios are inconsistent. Green Bay at first was negative, listed by the Corps at 0.08 (for every dollar spent only eight cents would come back) but a year later it was up to 1.18. Same for Port Washington, first listed at 0.67, but a year later at 3.46.

4. No mention is made of the relationship between winter navigation and two other Corps projects: Channel straightening and harbor deepening. Their environmental effects are not assessed.

5. Winter navigation capability would exist in very few Wisconsin ports. Those that didn't have it would be neglected and diminish in importance.

6. No assessment is made of the impact on other modes of transportation such as railroads or the Mississippi River.

7. Big, financially strong fleet owners would be favored and thus reduce competition between shipping companies.

8. The Corps Environmental Impact Statement does not adequately treat Wisconsin's unique fisheries in the Duluth-Superior Harbor or in Green Bay.

9. No mention is made of adverse effects on fish from uptake of heavy metals and toxic compounds. These now cause much contamination in sport and commercial fish and might increase.

10. The Corps is not telling the truth when it says the potential for oil spills could decrease during navigation in ice. Significant oil spills caused by winter navigation have already occurred.

11. A proposed one-time payoff to shoreline property owners for damage caused by winter navigation is not adequate and whatever type of shoreline protection is used would be esthetically detrimental.

12. Only minimal increased employment would occur in shipping industries, but shoreline damage could seriously hurt the recreation industry which now employs many people.

Political questions include the role of the states in the final decisions. The Corps of Engineers' policy is that a project will not be developed in a state that opposes it. How does this policy apply to the whole of the Great Lakes? Can one state stop a project other states still desire?

President Carter is asking Congress to require states to pay for a share of the navigation projects' costs. However, the proposed legislation does not clarify whether or how much the states would have to share in the costs.

Still another major question is the role of the public in the decision. It has been extremely difficult for interest groups other than those directly involved, such as the shipping industry, to understand all the implications of winter navigation. Since the program extends over so much territory and since the studies and demonstration projects have covered such small portions of the area, it is difficult to get a total picture.

But public attention is starting to focus and groups in New York, Michigan, Wisconsin and Minnesota have raised questions. We will all be listening to the answers. ○

Also, environmental and other possible impacts have been playing an increasingly important role in evaluation of the program. These include water levels, fish and wildlife and other considerations.

Whatever the outcome, the economic, environmental, and social aspects of this vast and rich Great Lakes region, encompassing the people of two great nations, may someday be shaped by these past years of winter navigation studies. ○

The unanswered questions

LEE BOTTS,
Chair Great Lakes Basin Commission

A classic conflict between engineer and environmentalist has developed within the Winter Navigation Board.

The conflict is not over whether the environment should be protected. Everyone agrees that it should be. The disagreement is over whether any environmental damage is likely, how much, and how best to avoid or correct it.

The engineer's view is that technically feasible action should go forward until environmental damage occurs. This view assumes that a promise to stop whatever is causing the trouble will provide protection against permanent damage. Further, this view assumes that the damage will be detectable and reversible.

The environmentalist's view is that human damage to ecological systems may not be visible until later. Also, it assumes that it is vital to understand the ecological systems ahead of time in order to detect or avoid changes. Thus, the environmentalist baffles the engineer by wanting to consider what kind of damage might occur, rather than proceeding and watching to see what happens. The engineer is frustrated further by delay of projects to collect the information needed to assess potential impacts.

These issues have been intensely debated in connection with the St. Lawrence demonstration. Should a channel be opened in the ice for ships before or after the possible ecological consequences are understood?

The St. Lawrence Seaway Development Corporation says the ships will stop if any environmental damage occurs. The State of New York insists that baseline environmental data be obtained ahead of time.

In my view, the debate highlights the most serious flaw in the entire project: the failure to consider early on economic and environmental relationships for the whole system.

The cost-benefit question also needs to be resolved. When the study was first authorized in 1970, an 8 to 1 cost benefit ratio was estimated. About 1½ years ago a Corps representative used 5.7 to 1 but stated that the actual ratio is uncertain because costs of environmental protection and corrective measures have not been included. The Pentagon has since used 2.75 to 1 as the ratio.

Providing for environmental protection is impossible unless it is known what is needed. So far, little attention has been given to questions about long-term, secondary environmental effects.

Will winter navigation encourage use of larger ships, which in turn would require larger harbors and deeper navigation channels, which in turn would require more dredging, which in turn would require more ways to dispose of dredge spoils? What share of the costs of these changes should be paid by the owners of the ships? We should consider, I believe, this kind of question as well as whether or not we can build ships strong enough to cut through winter ice.

A chilly business. Mariners worry about their health. Environmentalists worry about spills of hazardous substances.

Give it "the golden fleet" award

LINDA HAVERFIELD,
Madison, Midwest Representative, Sierra Club

It is important to place the Corps' plans for winter navigation in context. Year-round navigation is only one of its Great Lakes projects. The Corps is also looking at massive changes in the locks and connecting channels aimed at expanding the capacity of the system. The "St. Lawrence Seaway—Additional Locks Study" and "Great Lakes Connecting Channels and Harbors Study" discuss various ways to move deeper draft ships. One plan would accommodate 36-foot draft vessels with dimensions of 1000 x 130 feet through the Seaway and 1200 x 130 feet on the upper Great Lakes. Estimated cost: $52.8-billion (a price tag contingent on Canada's paying 25%). Such plans have in part been developed in response to the emergence of larger vessels that, in theory, take advantage of economies of scale. Also some believe an expanded system would syphon business away from other kinds of transportation and from the saltwater

ports. Given the seaway's financial problems such a view is questionable. In any event, winter navigation is a part of a much larger and far more expensive scheme and it has been developed for some of the same reasons: to expand shipping capacity.

According to a University of Pennsylvania study "this program could well cost 20 to 50 times the estimated cost of season extension."

Heated debate surrounds winter shipping. Shoreline property owners along the lakes and connecting channels are angered by damage to and loss of property; local jurisdictions along the shoreline are worried about environmental damage and the resultant loss in revenues from tourism and recreation; the Power Authority of the State of New York fears its generating capactiy will be reduced; seamen's unions are concerned about health and safety factors associated with traversing a sea of ice during winter storms in sub-zero temperatures.

The Corps has also been severely criticized for its lack of environmental studies. During the eight years the Corps conducted its Demonstration Program only the technological feasibility of the project was examined; environmental studies were not conducted, nor was baseline environmental data collected. Further, the manner in which environmental assessments are to be done, the methodology used to compute costs and benefits and the Corps' results have all been called into question.

While the Corps has identified a long list of harmful environmental impacts which could result, it has not chosen to conduct studies that would deny or confirm the magnitude of the impacts. Instead, and with no baseline data to assist in the process, the Corps has developed the "Adaptive Method" for determining environmental effects. Thus, environmental studies would be done along with project construction, operation and maintenance. The Corps claims that if irreparable and irremedial harm is done to the environment, the project would come to a halt. The likelihood of such action, however, seems remote indeed.

While the entire winter navigation program can be seen as the camel's nose in the tent for much more ambitious proposals, this approach of having shipping and then conducting studies exemplifies the application of another metaphor—the cart before the horse. Why can't the Army Corps of Engineers just collect the baseline data and be done with it? After all, industries chose, for presumably sound economic reasons, to locate on the lakes knowing full well that interlake shipping comes to a halt each winter and they have been operating for decades under this constraint. It is difficult to believe that the lack of winter shipping for a couple of months will spell financial doom—or even setbacks—for the steel industry and others.

There are numerous environmental impacts likely from winter shipping; some resulting from structural modifications and others associated solely with ships moving through ice. While little construction and no dredging are associated with the 6-week extension, the plans for year-round navigation include blasting and dredging three million cubic yards of bedrock and bottom sediment from the Middle Neebish Channel near Sault Ste. Marie, as well as dredging in other portions of the system. The project would also involve ice-booms and bubbler systems intended to inhibit ice formation in connecting channels. Bubbler systems move warm bottom water to the surface and circulate the cold surface water to the depths. What lower temperature will do to fish eggs such as whitefish and lake herring that are deposited on the bottom sediments in mid to late fall and what it will do to bottom organisms is not known. Dredging has many documented negative effects, among them the resuspension of settled organic and heavy metal pollutants. Year-round shipping also increases the risk of oil and chemical spills.

Along with the danger of spills, ships moving through ice cause wave surges and ice scouring in the connecting channels. These damage stream banks, wetlands and associated vegetation and wildlife habitats. Fishermen on the lakes are disturbed that fish productivity may be substantially harmed from increased sedimentation as well as decreased water temperatures.

Year-round shipping is predicted to be a goldmine because of the increased traffic in general cargo which the agency says can be captured from other markets. Both this assumption and the means used to arrive at it have been questioned. For example, 74% of the benefits claimed by the Corps stem from transportation rate savings which are based on differentials between Seaway winter rates and alternative overland rates.

But a Pennsylvania Transportation Institute study said this: "The whole diversion rationale is bizarre. Nowhere to be found in the Survey Report is any explanation of how or why diversion would work. It is simply assumed."

There are other economic problems with the Seaway that cannot be solved by winter navigation. The UW Sea Grant Communications office pointed them out this way: "Since the opening of the Seaway, radical changes in the technology of both inland and ocean transportation have had an almost catastrophic effect upon the Great Lakes-overseas general cargo trades."

The basic fact is that ocean-going vessels generally are much larger now than when the system was designed. Only a declining proportion of the world's merchant vessels can transit the Seaway now.

The Seaway has not lived up to the economic expectations of its boosters. Not mere winter navigation, but a project requiring many changes costing billions of dollars may be needed to reap benefits from diverted traffic. And why should the nation's taxpayers be required to pay for attempting to shift commerce from one region of the country to another?

The benefits of winter navigation are overstated. Moreover, when the Corps calculated costs of the project, it did not include environmental costs in the benefit to cost ratio, and these could be enormous. Given overstated benefits, understated costs and the possibility of any number of deleterious environmental consequences, this project is worthy of a new award—the Golden Fleet Award. ○

Continued next page. . .

"Adaptive Method"*

*From a U.S. Corps of Engineers' Study Report.

The complexity of potential environmental problems and concerns necessitates that extensive environmental studies be conducted during the post-authorization and early implementation period so that environmental impacts of winter navigation activities can be fully assessed, measured, and evaluated.

Additional environmental statements prepared prior to construction of any major item would define the monitoring program considered necessary to detect any subtle or cumulative unanticipated impacts and allow for corrective measures, if necessary. Project plans, construction, and operation activities would be altered as necessary to prevent, reduce, or compensate for significant adverse impacts. This process is referred to as the Adaptive Method. Mitigation actions taken would depend upon the significance of the adverse impact and would include, if necessary, the halting of vessel traffic should unacceptable adverse impacts be predicted or develop during monitoring.

Soo lock installations would require change: bubblers to keep water open; de-icing systems for lock gates, hinges and walls; and enlargement of the Middle Neebish channel involving three-million cubic yards of dredge material. Ships must turn at Whitefish Bay above the Soo and a massive bubbler system would be needed there to weaken ice so that vessels could change course.

Photo by H.G. Weis

Gold medal ice rink

When the starting guns fire at Lake Placid in February, Wisconsin will be there in spirit, in the flesh and in a carbon copy of the Olympic ice rink at West Allis. Our skaters could win because of it. Just ask the Russians.

JOHN NELSON,
DNR Public Information,
Milwaukee

Jerry Garbe thinks the Russians are coming. And when they do, he vows they'll pay the price: One Yankee dollar.

One Yankee dollar will give a visiting Russian — here for the 1980 winter Olympics — a chance to skate on the world-famous Olympic speed skating ice rink managed by Garbe for the Department of Natural Resources in West Allis.

One Yankee dollar also will get speed skaters from the American national team onto the rink that Garbe feels will play an important role in bringing winter Olympic honor to the United States in 1980.

For five months a year, Garbe and his helpers,like icemaker Lyle de Bombard lovingly and skillfully manicure and care for the oval rink, located on the State Fair Park grounds in the western Milwaukee suburb. And they watch young men and women grow and improve their speed skating skills with each passing day, each passing year.

A start at West Allis.

The warming house. Both the public and the skating champs use it.

This season will be special for the rink and for Garbe because the winter Olympics will be held in Lake Placid, N.Y. in February. And it will be special because the entire American National Speed Skating team will be practicing at his rink, day after day, gaining skill, strength and confidence for the Big Competition.

Most who know Jerry Garbe expect him to be glued to his television come the winter games, watching "his" skaters compete for the medals and honors that have motivated athletes and nations for thousands of years. But Garbe will not only recognize the skaters. He will see a rink, designed after ours here in Wisconsin, and completed two years ago with adjustments made just in time for the games.

"They had the same architects," Garbe explains. "They came out here to Wisconsin to see how we did things before they began."

Even though the Lake Placid rink will be open in time for the Olympics, the Wisconsin rink is where the action has been for 13 seasons and where the action will be prior to February. That's why Garbe expects the Russians — journalists, if not skaters to show up in West Allis.

Continued next page.

"This year we'll be swamped with foreign correspondents," he says. "They'll be watching our skaters.

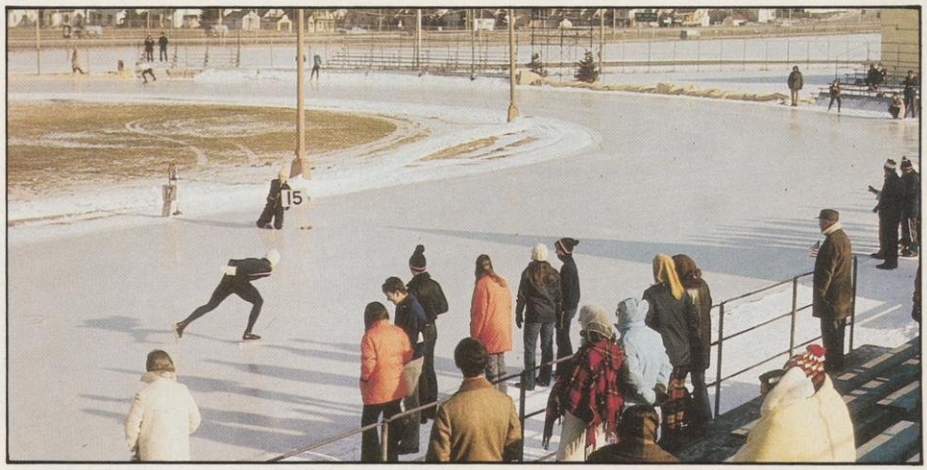
"They'll be here — taking pictures and writing their stories about the American National Team," Garbe speculates. He thinks there'll really be more stopwatch carrying Soviet journalists than Soviet skaters.

"And they'll probably get a chance to see the teams from Canada, Holland, Australia, Norway and elsewhere all practicing."

And if Garbe's seasoned judgment is correct, this *will* be the year to watch the American team. (You might call it a Wisconsin team.) There will be the famous Beth and Eric Heiden of Madison (Beth worked as a DNR summer intern), Peter and Leah Mueller of Dousman, the Plant brothers, Tom and Mike of West Allis, Dan Immerfall of Madison, Bill Heinkel of Fond du Lac. And more. All use the DNR rink, just as other speed skaters did before them, dreaming of victories and medals. And they have reason to dream: inspiration comes from medal winners Sheila Young, Diane Holum, who is current coach of the US National Team, Mary Meyers, Jennie Fish, and others.

"In fact, 16 of 26 gold medals won by the United States in the last four Olympics were won by speed skaters," says George Howie, Oconomowoc, president of the U.S. International Skating Association. "If it weren't for the Olympic Ice Rink, I doubt if we would have won more than two in speed skating."

That assessment is shared by skaters and Olympic supporters throughout the country. Evidence of that feeling appeared recently in an article published by *The Olympian,* the official publication of the U.S. Olympic Committee.



Olympic tryouts.

"Speed skating is far and away the winter Olympic event in which Americans have enjoyed the greater success," the writer, Don Eron, reported in the March, 1979 issue. "And the team has never been stronger than now . . . although there are only about 100 metric skaters in the country. Most of the skaters live within driving distance of the rink on the fairgrounds in West Allis, Wisconsin."

Indeed, the West Allis rink has been the key to America's speed skating success. Before its opening, Olympic supporters attempted — unsuccessfully — to build at several other locations including Oconomowoc where federal grant authorities said there weren't enough people to support it. After the 1972 games, Chicago tried to interest fans and participants in constructing a rink, but to no avail. Baltimore looked at the possibility, and dropped it.

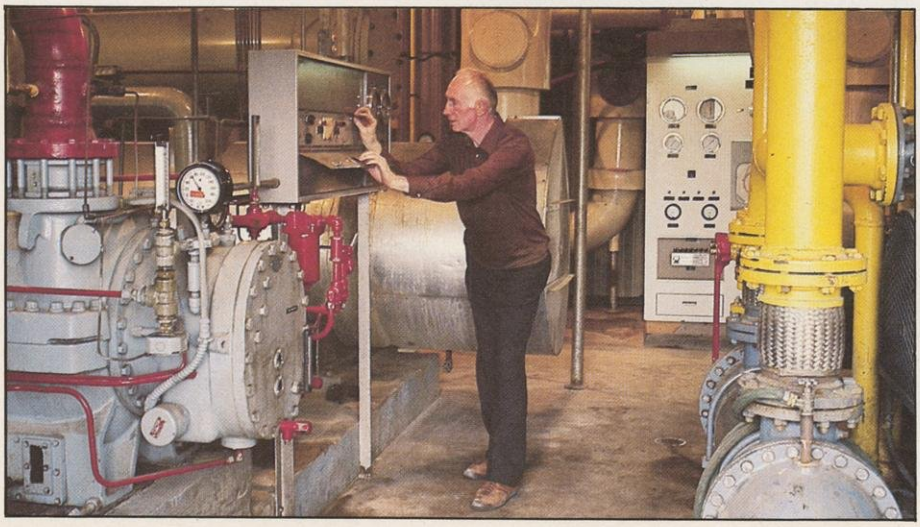
And though the West Allis facility has met unquestioned success, the road has not been easy. The rink was authorized by the Legislature and first assigned to the Department of Local Affairs and Development. After five years of operation it was assigned to DNR and its Southeast District Headquarters in Milwaukee.

Operating costs for the quarter-mile oval are about $57,000 a year, about half of which is picked up by the users. The fee is $1 a day for adults and 75 cents for children under 16. Everybody is welcome, Olympic, non-Olympic and general public. Hours are assigned to prevent conflicts:

Metric (Olympic) team skaters and hopefuls:
Saturday and Sunday; 9 a.m. to 11 a.m.
Monday through Friday; 2 p.m. to 4 p.m.
All speed skaters:
Saturday and Sunday; 11:30 a.m. to 1:30 p.m.
Monday through Friday; 5 p.m. to 6:30 p.m.
General public:
Saturday; 2 p.m. to 5:30 p.m. and 6:30 p.m. to 10 p.m.
Sunday; 2 p.m. to 6 p.m.
Wednesday; 6:45 p.m. to 9 p.m.
Friday; 6:45 p.m. to 10 p.m.

User fees cover only a portion of operating expenses, capital improvement and debt retirement. There is a financial squeeze, so a special committee named by Natural Resources

Rink manager Jerry Garbe adjusts one of the giant compressors that help keep Olympic ice frozen.



Secretary Anthony Earl is looking at the proper role of the agency in financing and operating the 13 year old rink.

Garbe envies the new all electric refrigeration unit that keeps Lake Placid's Olympic ice in top condition. He thinks that the commitment of volunteers and dedication of staff have helped offset the need for improvement at West Allis and kept the facility viable for training and competition.

For example, members of the Wisconsin Speed Skating Association donate their time and supplies and furnish materials for the annual fall "paint up, fix up week" each October. Skaters and their families gather to make repairs and wash and paint the rink a bright white. The rink must be white to reflect the winter sun and keep the 1½ to 2 inch thick ice from melting.

The fall fix up, Garbe says, generally kicks off the five month skating season, which begins about November 1, and brings people together who haven't seen each other since the last competition in March. It reinforces a fellowship that exists among competitors and their families and shows up in many ways.

For example, many West Allis and Madison homes are opened to skating visitors from outside the area. And this is no short term or small commitment! Skaters come to West Allis not only to skate — but to live, go to school and work. Many Minnesota skaters attend UW-Madison, take advantage of tuition reciprocity and practice at West Allis. Perhaps remembering the hospitality shown in other communities to their own speed skating daughter Chris, Jerry Garbe and his wife Lorraine often act as substitute parents for young competitors. Letters of thanks and gratitude from distant families help warm the Garbe winter — one of the rewards of the work.

This closeness the Garbes feel toward their young skaters is reassuring and even necessary, given the rigorous training Olympic competition demands. The skaters know, too, that Garbe understands they are there to practice, no matter what the weather or what the day. (Last year he trudged a mile and a half to open the rink in the middle of a January snowstorm; and even on below zero days he shows up to make sure conditions are the best possible for practice.)

"They're out there in the rain, the snow and the cold," Garbe says. "If they keep moving they don't freeze."

And move, they do.

Once a speed skater gets going, it takes only 32 seconds to complete the 400 meter oval. To qualify for the national team, skaters have to compete at West Allis, the only rink in the US that meets Olympic speed skating standards. Its ice surface measures 72,000 square feet. The speed skating course is 45 feet wide and includes two 16½ foot lanes.

In addition to Olympic team qualifications, the rink has hosted numerous other competitions including the Great Lakes Speed Skating championships, held there annually. The Women's World meet and the first World Sprint Championships (metric) were held there in 1971. Two years ago the North American Pack Style Meet ran at West Allis and in 1981 it will host the National Speed Skating Championships.

Indeed, the rink has brought not only skaters but visitors and notoriety to West Allis and Wisconsin. It has caused many to feel warm about our state simply because we have given US athletes a chance to excel.

And most importantly it has brought to Wisconsin, in a precious and personal way, that mystical Olympic spirit — a spirit that engenders both an intensity of national pride and international fellowship unmatched by any other continuing event in the course of recorded history. □

U.S. TEAM FEATURES WISCONSIN SKATERS

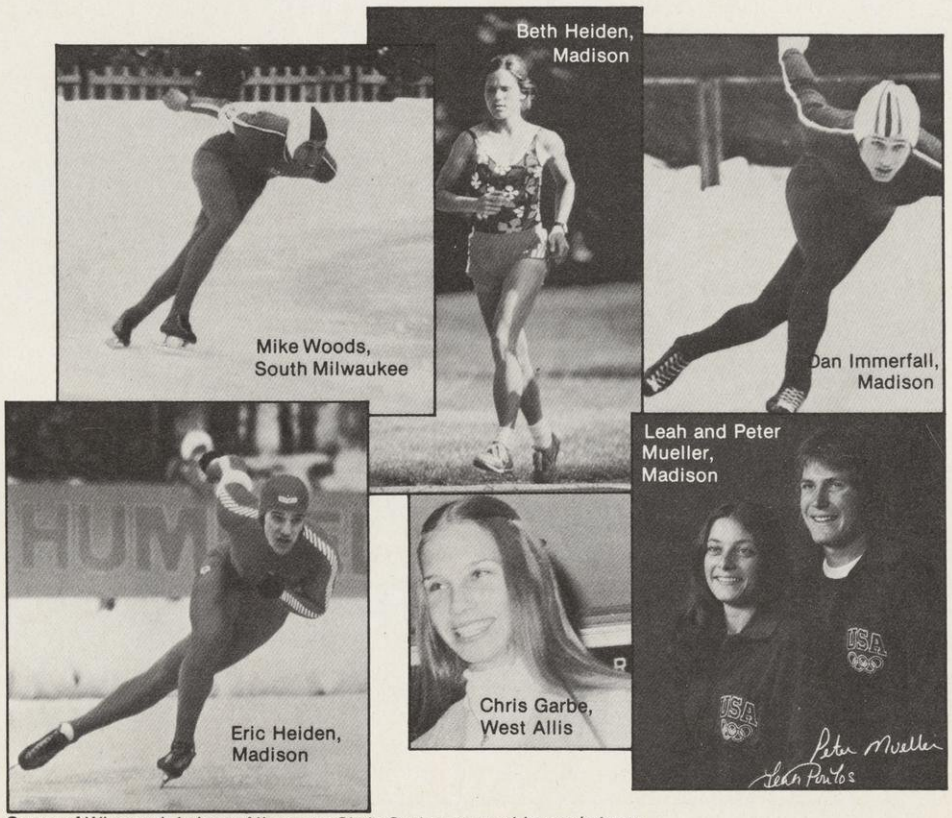
The United States International Skating Association team is made up of 22 men and 17 ladies. More live in Wisconsin than anywhere else: seven men and six ladies. They are:

Ladies

Beth Heiden, Madison
Mary Docter, Madison
Kelly Lunda, Madison
Sandy Chobot, Milwaukee
Leah Mueller, Dousman
Sarah Docter, Madison

Men

Eric Heiden, Madison
Bill Heinkel, Fond du Lac
Peter Mueller, Dousman
Mike Plant, West Allis
Mike Woods, South Milwaukee
Tom Plant, West Allis
Dan Immerfall, Madison



Some of Wisconsin's best. All except Chris Garbe are on this year's team.

Editorial:

Wetlands make a splash*

Agreement that Wisconsin's remaining wetlands should be preserved appears universal. Even farmers, who own most, and developers who like to build on wetlands have managed to join hunters, anglers, anti-pollutionists, pure drinking water advocates, birdwatchers, flood control engineers, nature lovers and others with environmental concern in wanting to stop the deplorable loss. At least they say so.

The disagreement is over how to go at it. Focus is on two big issues: whether saving wetlands should be assigned to local government or to strong central state authority; and whether farm land should be regulated at all.

Environmentalists want local participation but state-level control and few if any, exemptions. They fear most counties, villages and towns will do nothing to save wetlands unless required to. And they point out that nearly all remaining unprotected wetlands are on farms. For three years, Environmental Agenda, a rainbow assortment of 72 different organizations interested in the environment, has given a wetlands law top priority for action. But last October the group refused to endorse a bill that featured local control and a farmland exemption. The bill had been fretted over for months by a committee that tried to come up with a compromise that would pass. Farm groups, developers, and many local governments resisted state control and wanted agricultural land out.

Some pragmatic environmentalists say this is the best that can be expected, that a new law could be strengthened later, that at least some wetlands would be saved now in communities that care. Others find it completely unacceptable.

Last August, the Milwaukee Journal said this in a front page editorial:

> "Politically, it seems necessary to give private landowners a tax break on wetlands designated for protection and to bring local governments into the protection process. But the whole legislative effort will be a waste of time if the wetlands bill is watered down until it isn't thoroughly protective."

The issues will probably be debated in the legislature in February. How they are decided will determine whether wetlands are saved or disappear.

J. Wolfred Taylor

*See story on Wetlands, page 28.

Harley W. MacKenzie Dies

The man who became Wisconsin's first Chief Warden when the old Conservation Department was formed in 1927, Harley W. MacKenzie, 91, Poynette, died, September 27, 1979. He served as Chief until 1934 and was then named Department Director, a post he held until 1942.

MacKenzie was featured in the July-August issue of Wisconsin Natural Resources which was devoted to the 100th anniversary of the warden force. The MacKenzie Environmental Education Center at Poynette is named for him.

At the funeral a eulogy to MacKenzie was given by his son-in-law, Dr. C. C. Maher, Jr., Springfield, Illinois. This is part of it:

First, H. W. MacKenzie was a man of character and unbending principle. I knew him for forty years; I never saw him bend in a matter of principle. As far as Mac was concerned, right was right, wrong was wrong and there was no middle ground. He was for a time an officer of law enforcement; he did enforce the law, for which he had the utmost respect and he insisted that all be treated alike under the law.

He was himself once accused of dishonesty; to those who knew him well such a charge was frivolous at best. He wisely chose to ignore it, considering it beneath his dignity to reply. The people of this state agreed with him.

Second, he was a man of action and accomplishment. In every sphere of his life he was busy . . . athletics as a young man, music through his whole life, immensely productive in his professional career, active in community affairs wherever he lived, enthusiastic traveller, much sought after as lecturer and public speaker; he was a natural talent at all of this. The activities I've just described are but a fraction of the whole. As I knew him, he could not bear to be idle; there was always something to be done and he was busy at getting it done.

Third, he was a gentleman . . . or, better said, a gentle man. Physically strong, I never saw him use force

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Third, he was a gentleman . . . or, better said, a gentle man. Physically strong, I never saw him use force to accomplish anything. Bad language and bad manners offended him; the strongest language I ever heard him use was an occasional "damn." The most important part of his gentlemanliness was the loyalty it engendered. Over the years I have known him, the devotion of people who worked with and for him is almost unbelievable.

I'd like to add my personal view of what made H. W. the whole man he was. I think it was his love for this state: its lands, its waters, and its people. His whole life, public and private, expressed this love; he set new standards for a department which was then and is now a model for all; he wrote some of our laws regulating the use of public lands; he planted trees; he released fish and birds for anglers and hunters; he urged the purchase of land for future use by all of us.

In today's climate, describing these activities may seem trite, but H. W. did these things in a day when no other had the vision to see the need for them. I think this vision was his greatest attribute.

His physical being is not now here, but he is not gone. He lives, and will live, in our parks, our streams, our forests. We are lucky indeed to have had him.

The readers write

I was reading the DNR's recent issue of Wisconsin Natural Resources which was dedicated to the 100 years of resource law enforcement. Of special interest to me was the article headed "Dangerous Work," because as a district forester with the old Conservation Department from 1938 to 1944, I served as a deputy warden just before and during each deer season.

I was suddenly astonished to read on page eight that Mrs. Joe Jonas had died as the result of an ambush of her warden-husband's car in 1938. I looked up at my sister-in-law, who happened to be visiting at the moment, and said "Evelyn, did you know that you have been dead for over forty years?"

Yes, Evelyn (Jonas) Babcock is alive and well, living in Mosinee. She did lose a kidney from that gunshot wound, and for a time was in a very critical condition, but she did survive and later bore two children. Incidentally, she was not pregnant at the time of the shooting. My wife was, though, and being sisters there may have been a misunderstanding on the part of the reporter who covered the story.

At any rate, we are glad that the record is wrong and that you will need to correct it accordingly.

Frank N. Fixmer, Mosinee.

I'm confident by this time that Wisconsin's Natural Resources Magazine has received many requests and compliments for your superb "100 Years a Warden" issue. Please let me add my congratulations.

As one of the new trainee wardens I'd like to express my strong desire to carry on the proud unsurpassed tradition and record of Wisconsin's Conservation Wardens in the second hundred years.

Thomas Thoresen, Madison

Having taken the magazine since 1956 I felt it had become less than the quality bulletin I originally subscribed to—until your last issue. The article on wardens was par excellence.

What about the idea of having a life subscription? Pay it once and forget nickle and diming it to death.

I would also like to see a deer and bear season for big bore handguns.

O. D. Hedquist, Clear Lake

We would like to call your attention to a couple minor mistakes about plants in the Whitefish Dunes article in September-October.

The species name of sand reed is longifolia, not folia. The background picture on page five indeed shows trailing juniper, but misidentifies it. The correct name is Juniperus horizontalis, not Juniperus horizontalis, var. depressa which also occurs on the dunes.

R. H. Read and W. E. Tans, DNR, Madison

Just a note to compliment you on the production of Annie, Fannie and Mike—it was beautifully done. In fact, the entire issue was magnificent. I am looking forward to the rest of the series on endangered species.

William E. Sloey, UW-Oshkosh

The piece by Gary Knowles in your September-October issue is a textbook example of how to turn a dull, distasteful subject into an interesting feature by focusing on a human being. Please extend my congratulations to Gary for his article about "The Septic Lady."

Clay Schoenfeld, Center for Environmental Communications, UW-Madison

Values of Wisconsin's vanishing wetlands

PROF. CALVIN B. DeWITT, UW-Madison, Environmental Studies

We have come as citizens, as farmers, as business people, as public officials to a rather awkward turning point. We are beginning to look at our once neglected wet "wastelands" differently. What we once drained as useless, we now see as necessary to preserve our basic life-support system. Because this turning point is a real "about-face" in understanding, we find ourselves "bumping heads." We prize northern pike and love to fish for them, but destroy their spawning grounds with fill or drainage.

We are disturbed when floods devastate our homes and land while we ourselves fill a river-edge marsh to create a building lot. We complain about increasing weed growth in our lakes and at the same time promote development and sale of lake lots reclaimed from lake-edge wetlands. We wonder why someone doesn't do something about the declining duck population while we drain wetland habitats to grow carrots.

Turning points like this are frustrating because they show us that some things we destroy are the very things we want.

They frustrate because all people don't reach the turning point at the same time and because some have more to lose than others, should they make the turn. That attitudes toward wetlands are at a turning point is confirmed by the Wetlands Bill currently before the Legislature. That they frustrate is confirmed by the staunch positions of various interest groups. A few decades ago such a bill would not have been envisioned by anyone. And perhaps a few decades from now the threat we once leveled at a piece of our very life support system will seem incredible.

Why have we reached this point? The major reason appears to be increased knowledge of our environment and awarenes of ourselves as dependent in many ways upon its life support functions. As we learn more about ourselves and things around us, we increasingly become aware of the tremendous savings in energy and effort that working with nature provides in contrast to the great costs of attempting to duplicate or replace work done by natural systems.

What do wetlands do for us that would be too troublesome, too difficult or too costly if we did it ourselves?

Situated between water and land, they share properties of both and have unique properties of their own. As the most productive ecosystems in the state, they support wildlife, serve as fish spawning areas, ease flood peaks and protect water quality. Wetlands are not wastelands, although many have thought so and tried to turn them into something "useful." The result is that more than half are gone. The original land survey of 1850 recorded 4,696,448 acres. By 1939, "reclamation" had reduced that to 3.5 million acres and today it is 2.2 million and falling. For example, a recent survey showed that 30% of the landowners whose wetlands are used by Sandhill Cranes, intended to drain in one to three years.

It may be little recognized, but most Wisconsin animals and fish inhabit wetlands at some time during their lives. A direct relationship exists between wildlife abundance and acres of wetlands. For waterfowl, cranes, muskrat, mink and beaver, they are essential. Other species such as pheasants and deer use wetlands seasonally for food, water and shelter. Lake and river-edges are major spawning grounds for northern pike and to some extent for walleye and muskie. Such "natural fish hatcheries" operate at zero cost. Elimination of spawning wetlands means fewer natural fish and man-made hatcheries.

The importance of wetlands goes well beyond the esthetic since fish and wildlife provide recreation for one million people in Wisconsin who put some $200 million into our economy annually.

Wetlands situated between uplands and open water, intercept and store nutrients which otherwise would enter lakes and streams. They reduce the effects of agricultural and residential run off. Destroying the marshes means heavier fertilization with consequent greater growth of algae, lake weeds and rough fish and with consequent decline in recreation use. Extensive multi-million dollar government programs are now underway to reduce nutrient input to lakes and rivers through construction of better sewage treatment plants. It makes little sense to wipe out the gains made by adding the same nutrients through elimination of wetlands.

In a way, wetlands are like large sponges. They soak up the impact of large storms by storing water which thereafter is released very slowly downstream and which to a lesser extent is put into the air as vapor through evapotranspiration. The result is to reduce flood peaks.

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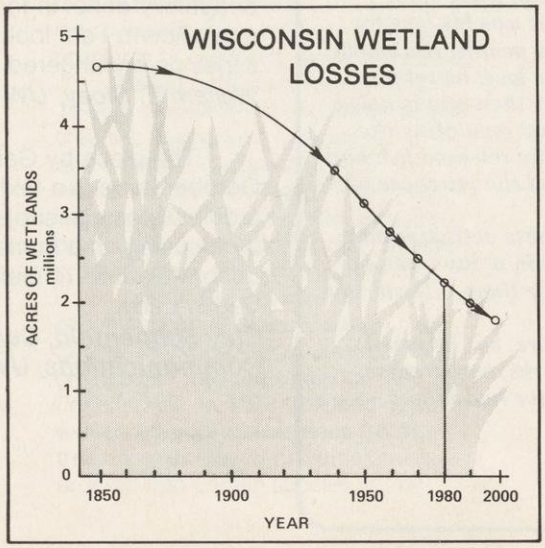


Chart by Georgine Price

Top right photo by David Thompson.
Bottom right photo by Jim Escalante.

The consequences of destroying wetlands along streams and rivers are significant. A study of the Charles River in Massachusetts by the Army Corps of Engineers, for example, showed that a 40% loss of wetlands along the river would increase flood stage by two to four feet and cause an additional $12-million in damage.

For many years, wetlands provided services largely unrecognized. Now they are beginning to be. Wisconsin society and all life benefit from them. Future studies of their structures and functions will find additional values. We still know relatively little, but what we do know now is more than sufficient to justify their protection. ○

NUTRIENT STORAGE

Wetlands are massive storage reservoirs of nutrients. Although these nutrients are in very dilute form, their quantity is still very impressive. For example, Waubesa Wetlands on the south edge of Lake Waubesa in Dane County has taken phosphorous out of water coming in from the surrounding uplands throughout its entire 6,000 year history. Each year this has amounted to 10% of the amount which would over-fertilize Lake Waubesa. A decision to channelize this marsh or any other lake-edge wetland is a decision to open the nutrient bank of 6,000 years and discharge it into the adjoining lake.

Agricultural concerns about wetlands legislation

MICHAEL R. VAUGHAN, Lobbyist, Wisconsin Muck Farmers Assn.

It is often alleged that agricultural interests - and particularly muck farmers - have taken and are continuing to take vast amounts of Wisconsin's wetland acreage. University of Wisconsin figures indicate that there are 40,000 acres of muck land in specialty crops (i.e., muck farms) and another 40,000 acres in general agricultural use. We estimate that no more than an additional 20,000 acres of muck land have potential for agricultural use. The "grand total" equals something less than 3/10ths of 1% of Wisconsin's 54,464 square miles.

This total also must be measured against the loss in wetlands which Wisconsin has experienced. Whether Wisconsin started with 5-million, 7-1/2, 9 or 10-million acres of wetland - each figure has been cited - the consensus is that 2-1/2 million acres of wetland are left. There is also a consensus that the continuing loss rate currently is 20,000 acres per year. In view of these numbers, it does not appear that the 40,000 acres farmed by members of the Wisconsin Muck Farmers Association (which, by the way, yield an inordinate percentage of the state's onions, celery, lettuce, carrots and mint, and a substantial percentage of the entire U.S. production of those crops) is a significant share of the total.

A more significant figure would seem to be the one million acres of wetland generally agreed to be *already* under public control at the federal, state or local levels. An unknown number of additional acres are effectively in public control through governmental purchase, particularly by the Department of Natural Resources, of key land parcels (such as parcels containing outlet ditches) which prevent drainage of other property still in private ownership.

Thus, it is important to remember, when considering this issue, that our remaining wetlands do not stand undefended before the bulldozer or the plow, but that over 40% are already in public control and much of the balance comes within the scope of one or more federal or state statutes, rules or regulations restricting wetland use.

The Wisconsin Muck Farmers Association is not a johnny-come-lately to the idea of enacting wetland safeguards, although it is a favorite myth of proponents that agricultural interests have opposed all wetland regulation bills. This myth ignores history. In 1975 Assembly Bill 604, developed by an interim committee of the Legislative Council chaired by Representative Lew Mittness, was a responsible bill establishing a permit system at the local level to regulate the use of wetlands. The bill was not opposed by agricultural groups, including our Association. Further, in 1977 Senate Bill 320, which passed the Senate but was not considered by the full Assembly, was supported by a number of farm groups.

More recently, our Association has sought to engage in discussions in the legislative process and outside it to develop wetland legislation that can be supported on a consensus basis. We believe the legislation should:

1. Be administered at the local level, with technical support from DNR.
2. Not overlap with other laws, where those laws provide an evaluative mechanism for wetland use.
3. Provide a weighing mechanism to determine whether the public interest is best served by a proposed land use or by preservation of that land in its natural state.
4. Distinguish between an urbanizing "using up" of land and an agricultural or other "using" which does not irrevocably destroy the wetland or which may even improve the wildlife habitat and other natural functions of that land. To this end, it should exempt certain activities (agricultural, silvicultural). I must repeat that these exempted activities would remain subject to a full range of existing laws to prevent land abuse.

I hope by the time you read this that wetland legislation consistent with these goals will be a long way toward enactment in Wisconsin. □

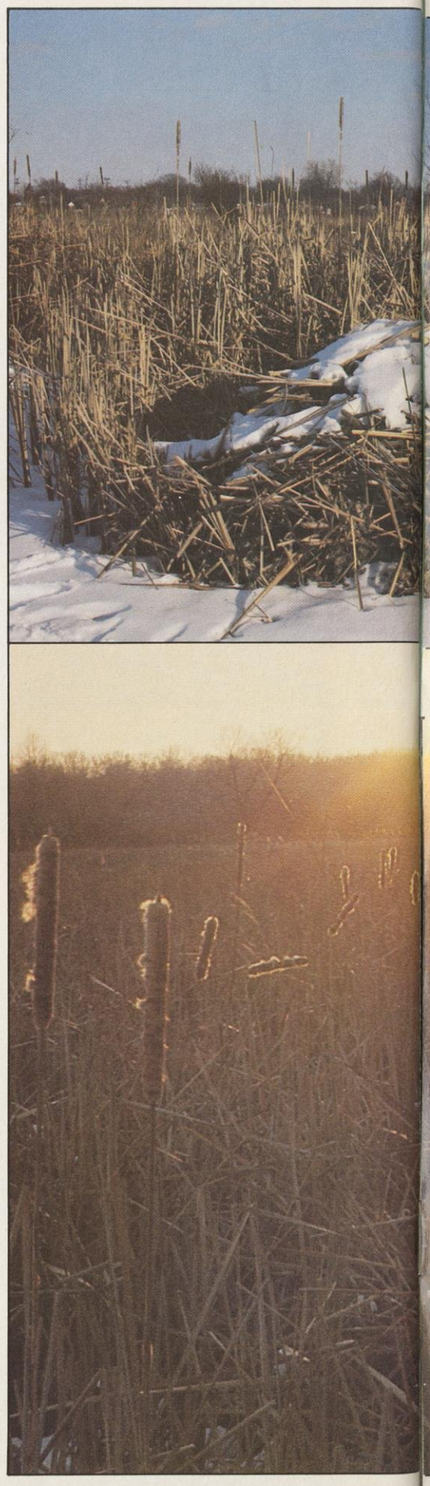
A POOR FOUNDATION

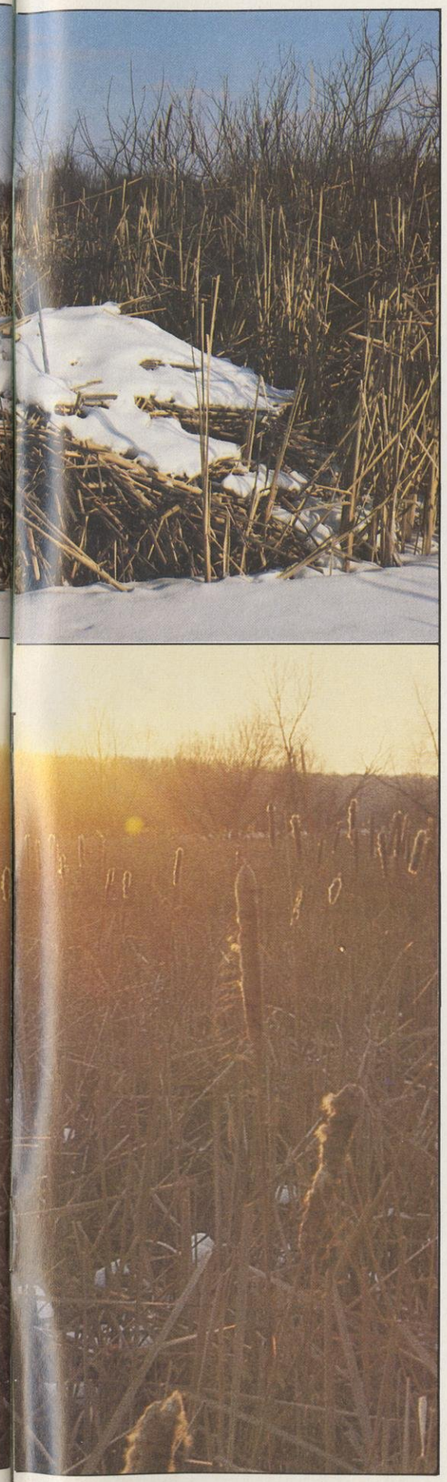
Most wetland soils are made up of dead plant materials which have been deposited in ages past and range anywhere from a foot to 100 feet in depth. These materials when exposed to air will decompose just like any other plant material. Thus, unlike other soils, wetlands can decompose and literally disappear. Also, because of their spongy nature, wetland soils compress under weight from above. Roads and foundations built on peat, or built on wetland fill, thus gradually sink. Since the sinking is uneven, foundations, building walls, and pavements crack as they subside. Road beds across peat soils continually have to have material added to prevent submersion. A decision to build any structure on organic wetland soils is a decision to incur a continuing series of costs which otherwise would not have occurred.

CITIES EAT AG LAND

Recent reports by the Department of Agriculture show that US cropland has remained constant at about 400-million acres for decades. The demand for drainage of wetlands comes not from the need for more acres, rather, it comes as a result of the removal each year of in excess of one-million acres from this cropland base for urban development and highways.

Drainage of wetlands is a poor way to compensate for policies which allow our best agricultural lands to be converted into housing developments, while other land unsuited for agriculture goes untouched by urban development.





Muck farmers now crop 80,000 acres of Wisconsin wetlands. Drainage and fill threaten the remaining 2.2 million acres. Photo by Jim Larison

Top:
Most Wisconsin wildlife spend some time in marshes. Photo by David Thompson

Bottom:
Wetlands are more than just pretty. They slow down runoff, prevent pollution, make floods less damaging. Photo by David Thompson

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