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WISCONSIN NATURAL RESOURCES

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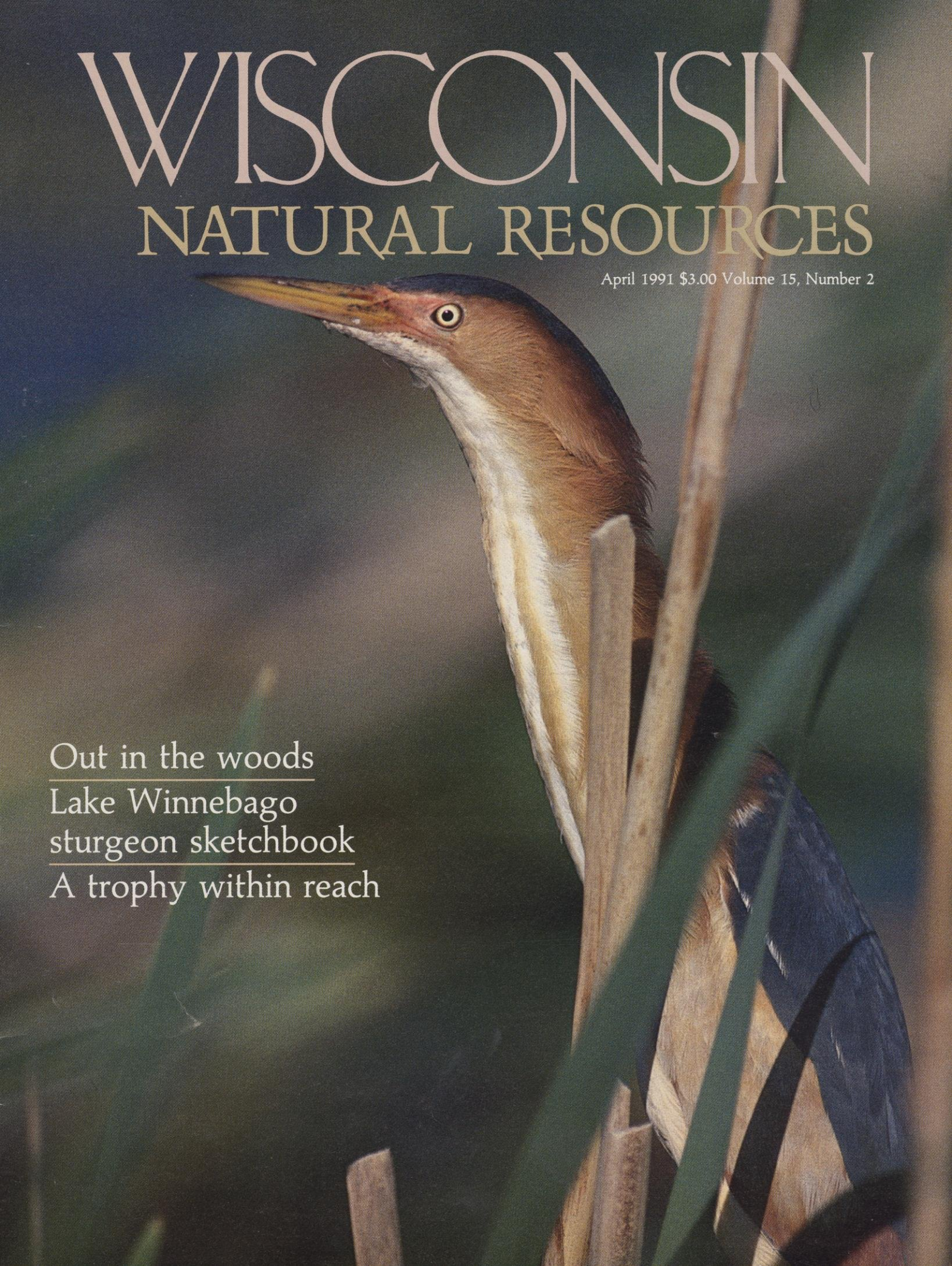

Out in the woods

Lake Winnebago sturgeon sketchbook

A trophy within reach

Purple finch.
GREGORY K. SCOTT

Redhead alert!

Scott R. Craven

It has taken a good half-century or so to arrive — and now that it's here, the colorful tourist from New York City intends to stay. The house finch *(Carpodacus mexicanus)* likely will become a permanent addition to Wisconsin's avifauna. Whether this feathered East Coast crooner will be a welcome addition is another story.

DAVID CREHORE

House finch.

A first encounter with a house finch usually is a pleasant experience. The male is a fine vocalist with attractive plumage. You may have seen one already and mistaken it for Wisconsin's native purple finch *(Carpodacus purpureus)*. The birds are similar in size, but in a side-by-side comparison, you'll notice the house finch's head is distinctly redder than the purple finch's rose or purplish crown. There's substantial variation in color: "Orange" house finches are

Continued page 35

Nesting house finches.

STEPHEN J. LANG

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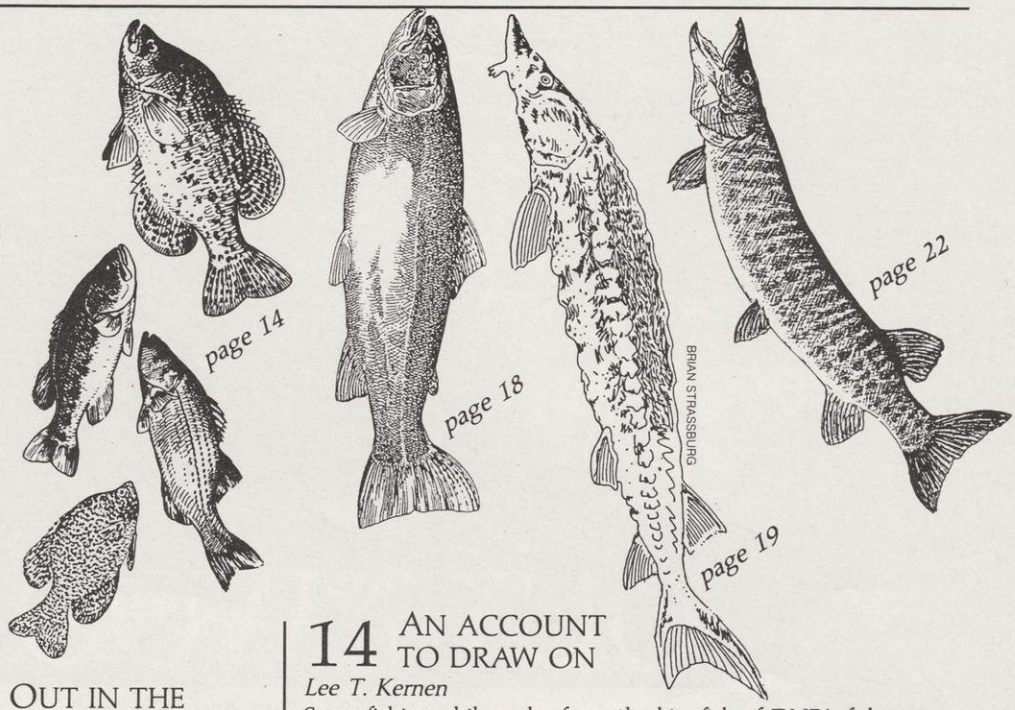
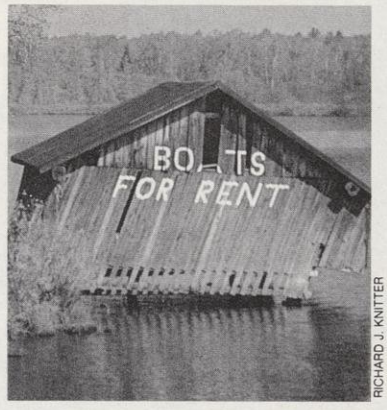


FRONT COVER:
Least bittern *(Ixobrychus exilis).*
© STEPHEN J. LANG, Madison, Wis.

BACK COVER:
Common wood snail.
© DON BLEGEN, Spring Valley, Wis.



RICHARD J. KNITTER

OUT IN THE WOODS

Changes in the human population of Wisconsin's forests present tough challenges for volunteer fire departments.

Kristin Visser

Twice in the past year when the fire alarm sounded in a small Wisconsin community, only three firefighters from the 25-member volunteer fire department were available to answer the call. The three were DNR employees based at the local ranger station; all the other volunteer firefighters were working at out-of-town jobs.

In another town, a volunteer force was able to muster only four firefighters in response to a February 8, 1989 fire call; a neighboring volunteer fire department was contacted for assistance. Says Joe Menkol, volunteer fireman and DNR forest ranger, "Luckily, it was a small chimney fire, which we were able to put out quickly. If it had been a more serious fire, we'd have been in a world of hurt."

Of the 851 fire departments in Wisconsin, 758 are organized and oper-

ated by volunteers. In fact, only 41 fire departments in the state are staffed by paid, full-time firefighters. Sheldon Schall, of the Wisconsin Department of Industry, Labor and Human Relations, estimates there are 23,400 volunteer firefighters currently on call in the state. Most fires require at least 10 firefighters for the safest, most effective response. Yet, as the examples above illustrate, some rural volunteer fire departments can run into difficulties calling up even half that number.

The reason? Changing demographics and land development patterns in Wisconsin's forests.

Nobody home?

"[Statistics show] If you're going to have a fire, you better have it at night or on a weekend," says Marshall Ruegger, DNR forestry supervisor stationed at Park Falls. Otherwise you may discover that your volunteer firefighters are miles away at their jobs in urban centers: They are part of the growing numbers of rural residents commuting long distances to work.

Recruiting firefighters is difficult, due to the aging population in rural areas. "Firefighting is a young person's game," says Ruegger. Retirees simply can't assist in fire fighting, putting a larger burden on the younger men and women of the community.

Work and home life increasingly stress these volunteers. A firefighter may not be able to leave work when the pager calls. He or she may be part of a car-pool, with no vehicle available for the ride back to the fire house. Out-of-town employers are reluctant to allow their employees several hours off to fight a fire in another community. This leaves the volunteer firefighter with the unpleasant choice of taking time off without pay, using precious vacation time or staying on the job while a fire rages.

Changing lifestyles also limit the pool of volunteers. People in rural areas must often work longer hours or take two jobs to pay the bills. Moreover as the economy weakens and competition for jobs gets fiercer, people often have to search farther from home to find employment. Young adults are leaving small towns in economically-depressed areas to search for jobs elsewhere.

A need for two-income households puts additional pressures on

DNR PHOTO

How do you protect wooded homes with fewer rural firefighters?

both spouses to get housework done and tend to children. Heads of single-parent families simply don't have the time to volunteer as firefighters.

At the same time, forestland development continues apace. Barry Stanek, DNR forest ranger and member of the Gordon Fire Department, notes the growth in second-home development in northwestern Wisconsin and in the number of retirees who choose to settle there.

City people retiring to rural vacationlands expect equivalent services like emergency medical response. That places a triple burden on rural firefighters to battle fires, to respond to emergency calls and to transport victims farther as small, rural hospitals close or consolidate.

Stanek could add industrial development to the list of increasing challenges. As small factories, rural subdivisions and second homes spring up in and around forests, firefighters are faced with more fire calls and more complex fires to fight.

Training takes time

Simply knowing where to point the hose may have been enough for volunteer firefighters in the past. Today's VFD member needs sophisticated training to deal with medical emergencies, burning chemicals and hazardous materials as well as standard house fires. For example, hazardous materials training requires 24 hours per firefighter per year — that's three days annually each volunteer firefighter must "donate" in addition to time spent on other special training courses, equipment maintenance, fund-raising for the department, and, yes, fire calls. It's unrealistic to expect people with little leisure time to spend their nights and vacations in the classroom or the firehouse.

Not to mention chores — fire prevention and maintenance requires attending to less glamorous tasks like inspecting buildings, cleaning hoses and flushing water mains.

Volunteer fire departments face legal heat too. Several years ago a fire department was sued for allegedly extinguishing a fire inadequately. The jury found the fire department 50 percent negligent, and the owner of the house that burned 50 percent negligent. Fortunately, the department's insurance covered the judgment. Like other kinds of insurance, the cost of adequate coverage for fire departments continues to rise.

Few bucks to burn

Firefighting isn't cheap. Considering equipment, training, staffing and maintenance, it can cost rural departments more than $200,000 to put a new pumper truck on the highway, says Ruegger. Most volunteer fire departments are largely funded through property taxes. Many also rely on fund-raising events, grants, and state and federal assistance to fill out their budgets. And, notes Menkol, the increasing costs of liability insurance for picnics, ball tournaments and other events is making community fund-raising uneconomical.

Answering the call

Despite the difficulties, Wisconsin's rural volunteer fire departments do a remarkable job of protecting life and property. Efforts are being made to keep up with changing times: The

DENNIS WENTHE

Wisconsin Vocational and Technical system provides firefighter training at places and times convenient to busy volunteers, allowing many departments to maintain a well-trained firefighting team. Some fire departments pool resources through mutual aid agreements. Minong, for instance, can join forces with the neighboring Wascott volunteer fire department.

Other departments share equipment to minimize costs. For instance, the Township Fire Department, Inc. provides emergency services to five rural townships encompassing 212 square miles that adjoin the City of Eau Claire. The fire department's 135 volunteer firefighters are coordinated by a paid dispatcher. The department's 20 pumper, tanker and equipment trucks are located in five substations. A fire call brings out firefighters from each.

The Department of Natural Resources also offers firefighting assistance to rural communities. DNR fire control experts are responsible for fighting fires in forests and undeveloped areas, called "wildland fires" in fire-fighting jargon. Local fire departments are responsible for fighting structural fires — burning buildings or homes. The Department of Natural Resources helps protect buildings in wildland areas, but DNR staff are not trained or equipped to fight structural fires.

Nevertheless, DNR fosters tremendous cooperation with its rural firefighting counterparts to educate rural residents about fire prevention, as well as equip, train and enhance firefighting response.

Volunteer fire departments perform a valuable, vital service for rural communities and the forests of Wisconsin. Whether you live year 'round in the forest or have a summer home in the woods, you can help local firefighters by following fire safety and fire prevention practices at home. ☐

Kristin Visser is the Budget and Strategic Planning Coordinator for DNR's Division of Resource Management.

DAVE KUNELIUS

Woodland home checklist

Follow these recommendations from the National Fire Protection Association and your state forester:

When building a rural home:

☐ Build driveways and access roads at least 18 feet wide, to accommodate ambulances and fire trucks. Emergency vehicles need at least a 45-foot turning radius to negotiate cul-de-sacs.

☐ Use fireproof materials and techniques during construction. Fireproofed walls, special window protection and treated lumber can retard fire.

☐ Install a spark arrester in each chimney to trap sparks and burning materials.

☐ Use only Underwriters Laboratory-approved woodburning stoves and heaters in your home. Install them according to manufacturer's recommendations.

☐ Install smoke detectors where recommended by fire inspectors.

Landscaping and yard maintenance:

☐ Stack firewood away the house, the garage, trees and other flammable materials.

☐ Tend burn barrels and place them so sparks, burning ashes and embers won't start fires.

☐ Compost your yard waste rather than burning it.

☐ Know locations of nearby dry hydrants, creeks, ponds and other water sources firefighters can use in an emergency.

☐ Plant trees at least 30 feet away from the house or other buildings; 100 feet if you're planting pines.

☐ Clear overhanging limbs and other obstructions over and around the driveway.

Home maintenance:

☐ Keep gutters, eaves and roof free of leaves, twigs, pine needles and other flammable materials.

☐ Clean chimneys at least once a year to prevent buildup of soot or creosote.

☐ Dispose of ashes and partially burned coals from fireplaces, woodstoves and barbecues by wetting them thoroughly and dumping them in an earthen pit.

In case of fire or emergency:

☐ Know what fire protection is available and how to summon help.

☐ Post emergency numbers by each phone.

☐ Clearly mark your house and driveway with your fire number so emergency vehicles can find your home.

☐ Provide an adequate water supply to fight fire. Your well should have enough pressure to douse the house with a garden hose.

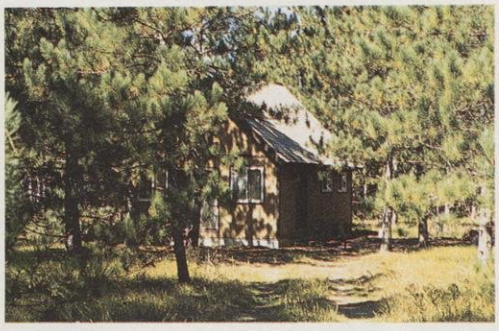
☐ Practice your safety plan. Make sure each person has two escape routes from each bedroom.

DEAN TVEDT

(left) Hot raging forest fires consume everything in their path, including homes.

(right) A wooden home nestled close to overhanging trees is especially vulnerable.

(bottom) DNR fire control specialists will share proven techniques for reducing the fire risk to woodland homes. It's up to builders and homeowners to follow the advice, use fire-resistant materials and plan for fire emergencies.



COURTESY OF BARRY STANEK

DEAN TVEDT

DNR'S MULTI-ARMED OUTREACH

DENNIS WENTHE

Men and women from all walks of life volunteer to fight wildland fires in their communities. The skills DNR crews teach may be needed nationwide. The National Forest Service flew this Wisconsin crew to northern California to battle a persistent blaze.

Department fire control specialists and foresters train interested citizens to fight wildland fires and help with prescribed burns on wildlife areas. Larry Schmitt, Boscobel forest ranger, started a program in 1980 to keep forest crews more fully staffed, assist with prescribed burns and provide trained crews for the U.S. Forest Service to fight wild fires outside of Wisconsin.

In the last five years, Schmitt's trained crews of private citizens have joined Forest Service firefighters battling blazes in northern Wisconsin, northern Minnesota, the Upper Peninsula of Michigan, Washington state, Oregon, northern California, Yellowstone National Park, Montana and Idaho. Some of Schmitt's graduates have become foresters, Forest Service "hotshot" crew members and backups to DNR firefighters statewide.

Beyond their training, this group of carpenters, farmers, business owners, students and homemakers has tremendous local influence. "From each person on a crew, I see benefits rippling through the community in preventing fires," Schmitt said. Crew members share their experiences "eating smoke" at family get-togethers, during bowling leagues, at civic meetings and religious gatherings. "The crew members give their friends and families much more of an understanding of the damage fire can do and that provides an excellent lesson in understanding the importance of fire protection and prevention," Schmitt added.

He heaped special praise on one local volunteer, a farmer who has photographed many of the fires he has helped extinguish. "This guy gives slide shows to adult groups, church and civic talks," Schmitt continued. The farmer has also paid his own way to take fire training with the Forest Service, become an EMT and qualify as a crew boss with federal firefighters, Schmitt noted.

"Eight other crew members took chainsaw training on their own time," Schmitt said. The volunteer crew became so proficient that a nearby ranger trusted them to help mop up a Bear Valley fire (western Sauk County) last year when several concurrent fires spread DNR firefighting efforts pretty thin.

Schmitt noted that DNR forester/rangers help train local fire departments and accompany local firefighters when inspecting fireprone property. Some

DEAN TVEDT

Wooded subdivisions need to be planned and regularly inspected to lessen the many hazards of fighting fires where houses are surrounded by fuels.

TO COMMUNITY FIREFIGHTERS

COURTESY OF BARRY STANEK

A volunteer fire department battles to protect this home from the engulfing Oak Lake Fire in 1980. Statisticians have started tallying the value of properties saved as well as those lost to such conflagrations.

rangers teach evening courses at vocational schools to train volunteer fire departments. A relatively new class teaches how to fight house fires in wooded areas, called the "urban/wildland interface" by forest professionals.

DNR forest rangers also manage federal cost-sharing programs that cover 50 percent of the costs for rural firefighting equipment, protective gear, communications equipment and part of the cost to install smoke detectors in woodland homes.

"We're into training programs heavy duty," Schmitt says. DNR-sponsored mock fire exercises simulate conditions so realistically that local fire companies use them to develop tactics and identify fireprone properties.

One such simulation showed that 93 of 120 homes in a subdivision would have been lost in case of fire. "That really opened the eyes of the local town chairman," Schmitt said. That township's efforts convinced Grant County to institute the state's first forest fire prevention zoning ordinances that specify road grades, construction techniques, power line location and installation, and other features that enhance community fire response.

For example, DNR programs have helped plan and install "dry hydrants" for rural fire protection.

In villages and cities, subdivisions are built with water hydrants where firefighters can hook up hoses to pressurized fire hydrants to fight a blaze. However, some new subdivisions have been built 10 miles or more from water sources where tankers and firefighting pumpers could load up. In these cases, fire departments search for lakes, ponds or rivers near roads that are closer to the subdivisions—ideal locations for a dry hydrant.

An underground pipeline is constructed connecting the hydrant to the body of water. These pipelines may run several hundred feet. In case of fire, a pumper truck can hook up to this roadside hydrant and draw water into the tanker, saving valuable time compared to a round-trip run into town. Former DNR ranger Paul Pendowski launched the dry hydrant program at a tree farm in Oconto County in the mid 1970s. Now more and more communities plan and construct dry hydrant systems, a proven technology for saving lives and homes in rural areas. For additional information about dry hydrants, write Forest Ranger John Pohlman, W8945 State Highway 8, Ladysmith, WI 54848. □

COURTESY OF BARRY STANEK

Testing a "dry" hydrant: a conduit from roadside to waterway in rural areas where pressurized hydrants are impractical.

STAND BY YOUR PLAN

BEETLES, BORERS, CANKERWORMS, FUNGI AND ROOT ROT CONSPIRE TO DO IN TREES. SAVVY WOODLOT OWNERS FOLLOW A PLAN TO BEST THE PESTS NATURALLY.

Jane Cummings-Carlson and Carol K. Nielsen

Insects and diseases are as natural a part of forests as ferns, trees and poison ivy. We may not like them, but we appreciate their role as woodland builders, destroyers and decomposers. While we cannot and should not eradicate every pest, it would be unwise to let their numbers increase unchecked. By using a combination of natural pest management techniques, woodlot owners can often keep insect populations under control.

ARTICLE PHOTOS COURTESY OF DNR FOREST INSECT AND DISEASE MANAGEMENT UNIT

They call it decay training. Foresters, college students and parks managers learn to identify the telltale signs of insects and disease in tree stands. DNR forest entomologists and pathologists lead workshops to describe how woodlands can be planned, planted, thinned and groomed to minimize pest damage. Most often, chemical controls are not needed. These same techniques will work on small woodlots.

Leaf-feeding insects, cambium-eating beetles and wood-decaying fungi all stress trees. Their actions lead to woodland changes that may be viewed as good or bad, depending on the landowner. An aspen killed by fungal decay is certainly a loss to a pulp producer, but it's a gold mine for woodpeckers and birders.

Signs of insects and fungi on trees actually help monitor a forest's health. Dying trees may indicate a forest in transition, a woodlot under siege by microorganisms or a forest just begging for a little help.

You can improve your woodlot, maintain the value of standing timber and get more out of woodland nature hikes by learning to recognize the signs of insects and disease. We'll concentrate on some of the major pests in our hardwood forests, how they can be managed, and where you can go for help.

They specialize on stressed trees

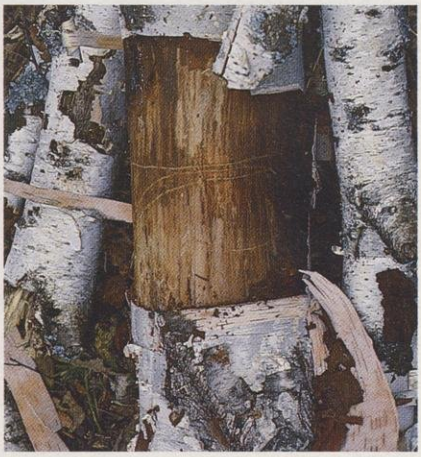
Insects and fungi lurk in the forest, waiting to attack trees stressed by drought, defoliation, flooding, nearby construction, cuts and wounds. Three of these opportunists — the two-lined chestnut borer, the bronze birch borer, and *Armillaria* root rot — have been thriving recently on Wisconsin's hardwoods, which have been weakened by two years of drought and infestations of two insects that defoliate trees.

The defoliators move in first. The forest tent caterpillar

Fall cankerworm. It eats leaves, cutting the tree's food supply. Weakened trees are susceptible to other ailments.

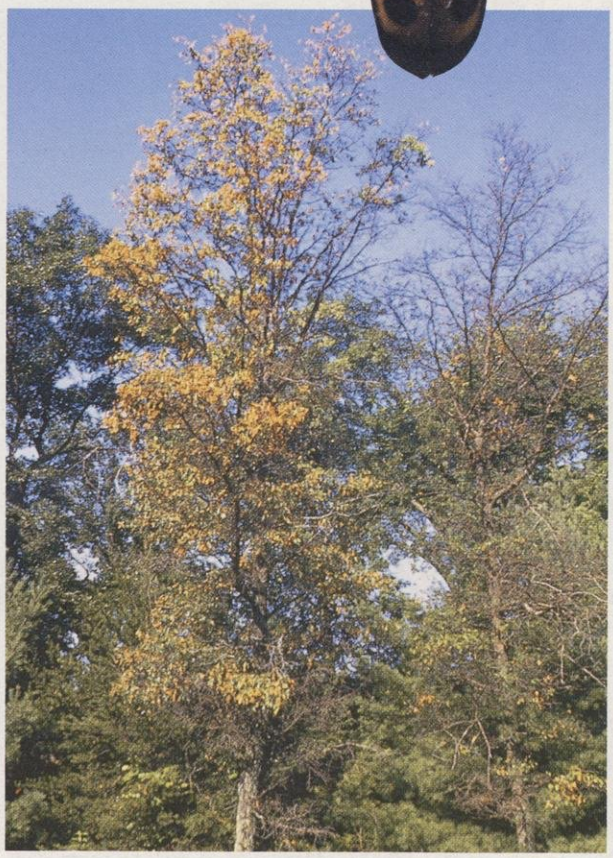
feasts on oak, aspen and occasionally, maple in northern Wisconsin in the spring. These caterpillars do not spin a tent; instead, they form a silken mat on a tree trunk or branch where they congregate to molt. The fall cankerworm, most common in south-central Wisconsin, feeds in the spring on oak, maple, hickory, ash and cherry. Normally, bad weather, parasites, disease and predation by beetles, ants, true bugs, spiders, birds and small animals keep caterpillar and cankerworm populations in check. Outbreaks occur when warm, dry springs give the defoliators the edge.

Trees usually survive this spring defoliation and often grow a second set of leaves in early to mid-summer. But refoliation comes at a price — the tree must draw on starch reserves stored in the roots to produce new leaves. Expending this additional energy weakens the tree and makes it more susceptible to invasion by the two-lined chestnut borer, bronze birch borer, and *Armillaria* root rot.



Caught with its defenses down. Trees weakened by drought and defoliation can't fight off other invaders. Bronze birch borers tunneled these horizontal tracks across the tender cambium layer, cutting sap flow and killing the tree.

Borer larvae kill stressed oaks and white birch by feeding between the bark and cambium, cutting off the flow of water and nutrients to the trunk and branches. *Armillaria* root rot invades stressed hardwoods through the roots and at the ground line, decaying wood, causing twig and branch dieback and eventually killing the tree.



Defoliated oaks in mid-summer are often a sign of oak wilt. The tree on the right is dead. The treetop on the left is dying too. Oak wilt fungus spreads where infected roots connect with roots from healthy trees. Picnic beetles *(on top) (Nitidulidae)* feed on the oak wilt fungus.

Oak wilt

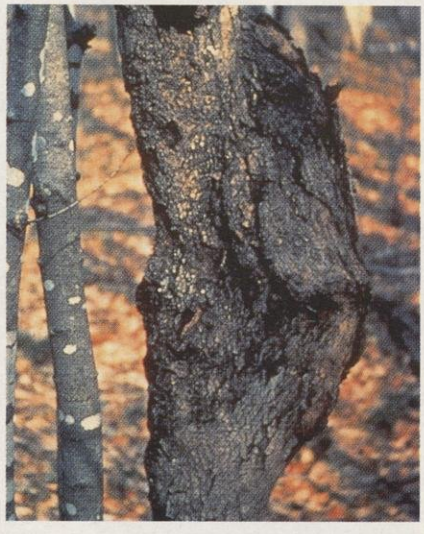
Oak wilt is a fungal disease prevalent throughout the southern two-thirds of Wisconsin. The fungus, *Ceratocystis fagacearum*, enters a healthy oak through open wounds where picnic beetles feed or where root grafts connect healthy and diseased trees. Picnic beetles, the little black bugs you find crawling in beer or wine at summer picnics, are attracted to the fungus, which smells like fruity gum. Once the fungus enters the tree, it plugs up xylem or phloem vessels causing leaves to wilt and fall. If you've ever seen an oak lose all its leaves during a few summer days, you've likely seen oak wilt. Once infected, trees in the red oak family (red, black, northern pin) die rapidly and will not refoliate. Infected white oaks (white, bur, swamp white) may die over several years, losing a few branches each year; some may overcome the infection and survive.

Cankers

Have you ever noticed crooked or misshapen tree trunks? Some of these cankers are caused by a group of fungi. Two of the most common are *Nectria* and *Eutypella*.

Nectria cankers occur on red and sugar maple, black walnut, largetooth aspen, white oak and sweet, yellow, and paper birch. They center around branch stubs and infect two- to 20-year-old trees. Young cankers look like flattened or depressed areas in the bark and develop into target-shaped cankers.

Eutypella cankers usually infect maples — red, Norway, silver, sugar, sycamore, black, and box-elder. The fungus gains hold at broken branch stubs or logging wounds. A typical canker has a sunken center surrounded by flared callus folds. Some call it "cobra head" canker. Cankers make trees less valuable to loggers by degrading the



The flared cobra-shaped head of the Eutypella canker is easy to recognize. Deformed logs make poor lumber but artsy carvings.

most valuable portion of the tree, the butt log or first eight feet. On the other hand, some artists fashion bowls and art pieces from tree cankers. The disease typically doesn't spread throughout a stand.

Decay

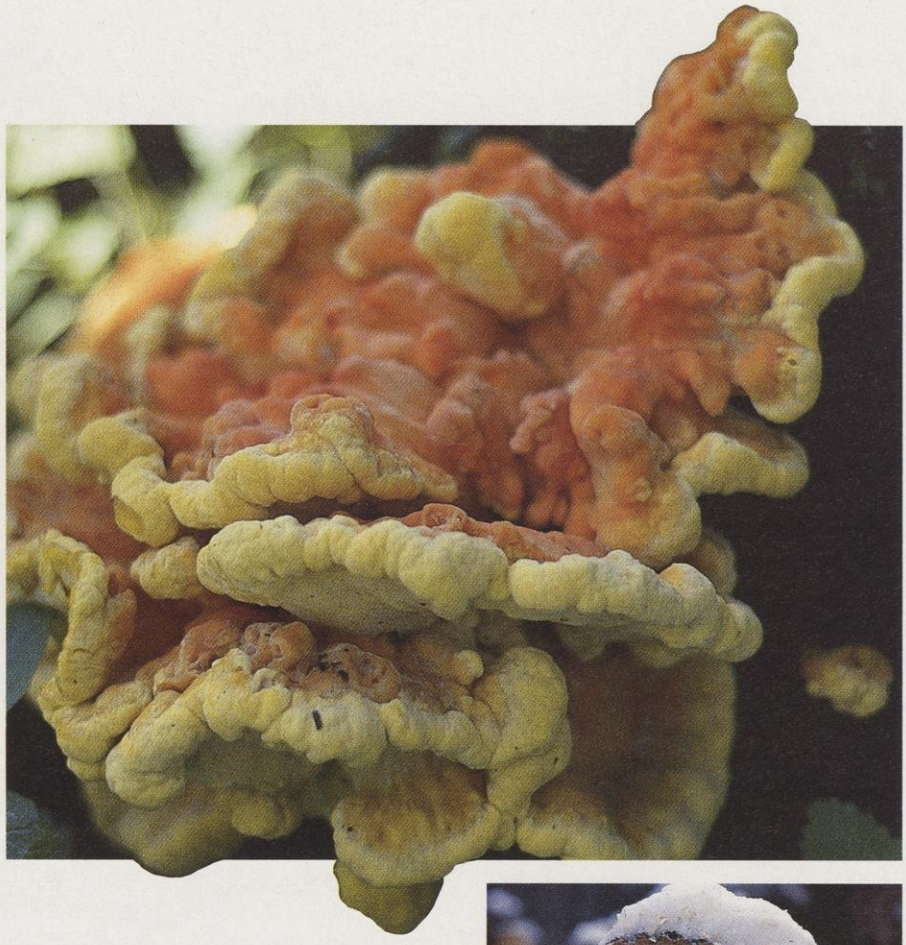
Fungi that decay trees are as ubiquitous as earthworms in fertile garden soil and as treacherous as a praying mantis waiting for its victim. Decaying fungi enter through broken branches, injuries to the main stem, fire scars, and broken tops. Once these fungi are under the bark, they start breaking down woody tissue, weakening both the woody structural corewood and nutrient storage systems. Trees can defend themselves against this fungal onslaught by forming physical and chemical barriers that wall in the decay, keeping it away from the heartwood and the cambium. The tree continues to add new healthy growth around the injured area.

Frost cracks — long vertical cracks on tree trunks — start from decaying areas inside a tree. If you notice a lot of frost cracks, those trees were probably wounded in the past, perhaps from an ice or wind storm or from careless logging.

Some decaying trees provide food and nesting sites for wildlife. Woodpeckers are often the first animals searching for insects and excavating nesting sites in decayed areas. When the woodpeckers move out, other birds and many mammals such as raccoons, martens, weasels, mink, skunks and foxes may use decayed snags for nesting or roosting.

Would your woodlot benefit from a timber sale?

People maintain their health with exercise, diet and prompt medical attention at the first symptoms of illness. We avoid major losses from forest insects and diseases by selecting disease-resistant trees, improving timber stands, timing harvests and detecting pest problems early. A forest management plan, tailored to your interests, can be prepared by a DNR, consulting or industrial forester. With a little imagination, your woodlot plan can provide a visually interesting, varied landscape that promotes a mixture of habitats to attract wildlife.



(top) The fungus *Laetiporus sulfureus* colorfully flags impending death for this tree. The tree could be used for firewood or become a nesting snag for birds and mammals.

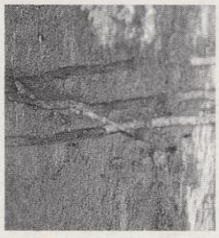
(right) Darker wood shows where this white ash walled off decay and grew for many years.

Set up a management plan as soon as you acquire a woodlot. A plan establishes a timetable for maintaining a healthy forest through practices such as: 1) planting the best species for your site, 2) thinning when a stand is overstocked, 3) harvesting overmature timber and 4) harvesting diseased and insect-infested trees.

Contact a forester whenever you are considering harvesting timber. Professional advice can help you avoid harvesting practices that invite insects and diseases. Minimizing logging damage and selecting the right time of year to harvest each species can improve your woodlot's overall health. The forester can offer sound business advice about writing logging contracts, selecting reliable loggers, conducting a timber sale and timing the harvest so your forest income can be spread over many years. □

DNR Forest Pathologist Jane Cummings-Carlson leads workshops for foresters and woodlot managers on building healthier stands of trees. Carol K. Nielsen is DNR's forester in Iowa County. She writes many forest management plans for hardwood and coniferous stands.

Common Infestations in Wisconsin Hardwoods

THE PESTS	POTENTIAL DAMAGE	POTENTIAL BENEFITS	MANAGEMENT ALTERNATIVES
Forest tent caterpillar and fall cankerworm	Periodic outbreaks cause heavy defoliation in the spring, inviting attack by borers and root rot. Outbreaks dramatically slow tree growth.	Provides food for warblers and other insect-eating birds. Poor quality oak stands with an understory of conifer or maple may benefit from defoliation. As oaks die, the maples or conifers take over and grow quickly.	Outbreaks often occur where trees are planted too densely, can't compete with shade-tolerant species or are overmature. Maintain proper stocking with periodic thinning. Harvest when trees become mature.
Two-lined chestnut borer	Usually kills oaks greater than five inches in diameter. Individual trees or pockets of trees may become infested. Other tree species may take over the site. Small animals and birds that eat acorns and tree buds may have less food.	When tall trees that form the forest canopy die, the woodlot will remain brushy for about 10 years. This will attract warblers, grosbeaks, cuckoos, cardinals, grouse, rabbits, deer and shrews. Dead trees also provide nesting sites and a source of insects for birds.	Maintain proper stocking so oak stands are neither too dense nor to sparse. Thin weakened trees. Remove dead and dying trees before spring to reduce the risk of further attack. Consider converting the stand to different trees such as conifers.
Armillaria root rot 	Kills scattered trees or pockets of trees greater than five inches in diameter.	As trees die, small brushy openings may benefit grouse, wild turkeys, deer and rabbits. Mortality may provide natural thinning if the stand is overstocked. Large dead trees may provide good perches for raptors. Brown creepers nest under sluffing bark.	Maintain proper stocking and harvest mature trees.
Bronze birch borer 	Kills trees or just treetops. Trees more than 40 years old and trees that normally grow in moist areas exposed to drought are especially susceptible to this borer. Infested trees decay rapidly, so lumber must be salvaged within a year of infestation. Birch are unlikely to grow again in the same spot. Less valuable species such as soft maple, aspen or brush may fill in.	May provide a short term food source for woodpeckers. Birds will drill and peck the decaying trees for the bronze birch borer larvae and wood borers. Some sites may grow back to other northern hardwoods such as sugar maple or red oak, if these trees are present.	Under the best of circumstances, it's difficult to perpetuate birch stands. Birches are a pioneer species that usually give way to successive species. Harvest white birch when they are approximately 40 years old. Harvesting before maturity encourages stump sprouting and continues the white birch forest, unless the birch sprouts are heavily browsed by deer. The woodlot could also be converted to other species through planting and proper site preparation.
Oak wilt	Pockets of red, black and northern pin oak will die. White and bur oak may survive infestations.	As oaks die, the opening can provide valuable feeding and nesting sites for wildlife.	Do not injure or log oaks from the time buds start to form in spring until leaves fully form in early summer. If infected trees are cut for firewood, cover the woodpile with heavy plastic for 1½ years following wilting. Stop disease spread by breaking root grafts between diseased and healthy trees.
Nectria canker 	Deforms trunks and slows growth of maple, black walnut, large tooth aspen, white oak, and sweet, yellow and paper birch.	If decay breaks down woody cankerous tissue, an infected tree may be excavated for nesting or roosting sites. Cankers may provide insects for birds. An occasional canker may be suitable for woodworking and art objects.	If less than 20 percent of the trees important to you are infected, continue with normal planned management. If more than 20 percent of selected species are infected, plant trees that naturally resist cankers like red oak, hickory or ash. Remove infected trees during timber stand improvements. Protect trees from stem wounds during harvests. Harvest cankered trees for firewood.
Eutypella canker	Kills maples less than three inches in diameter, limits the production of quality wood and increases the risk of wind breakage on larger maples.	Squirrels may feed on the fungus growing under the bark. This will kill the tree faster. Small trees killed by this canker provide nesting sites for small birds.	Remove cankered trees or place cankers face down on the ground (to limit spore dispersal). Protect trees from stem wounds during harvests. Harvest cankered trees for firewood.
Decay	Often damages the wood in the most valuable portion of the tree, the butt log, or first eight feet.	Decayed trees make excellent nesting and feeding sites, especially oak, sugar maple and hickory. Decaying aspen, birch and bassword also provide nesting sites, but these species decay more quickly.	Remove obviously decayed trees during scheduled thinnings or harvests. Minimize wounding! Harvest decayed trees for firewood, but leave one to three decayed trees per acre for wildlife to use as nesting, feeding and perching sites.

TAMMY A. PETERSON

AN ACCOUNT TO DRAW ON

With help from anglers, DNR's new director of fisheries management banks on a bright future for fishing in Wisconsin.

Lee T. Kernen

I love to fish, just like the nearly two million other anglers who test Wisconsin's waters each year. If you ask anglers why they fish, you're likely to get a thousand different answers. Most fall into a few general categories: "I like being outdoors," "I want some fish to eat," "I like being with my buddies (or family or children)," "I like the challenge of outwitting the fish" or "I want to catch a trophy." Some people want lots of panfish, some want a chance at a record, some fish for sport alone and release all the fish they catch.

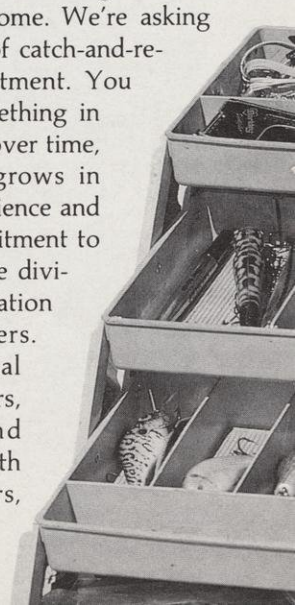
Ask me and my team of professional managers if we can really satisfy all those requests and we'll answer with a strong "Yes." What we can't do is provide all those opportunities on the same lake or stream. Let me explain how it works.

We have some beautiful, productive waters in our state and we catch millions of fish each year. But why, for example, is walleye fishing so much better in Canada? The answer is simple: Far fewer people fish Ontario's wilderness lakes. In Wisconsin, we take too many fish out of our waters and the fish populations can't build up as they do in unfished or underfished lakes. Believe me, our counterparts in Ontario are equally concerned about losing quality fishing in their wilderness lakes. Like us, they dropped daily walleye limits to three per day and instituted size limits on many waters.

I view fish populations like savings accounts. If we take all the interest out each year, our funds will never grow to meet future needs. That's what happened on many lakes and streams in the last 50 years — we took out fish and assumed nature would make up the deficit. On some lakes, we dipped too heavily into "principal" and squandered our natural fish stocks.

Today, more people are fishing and using sophisticated equipment that helps them fish more effectively. To counter the increase in fishing pressure, we need to let our fish accounts accrue interest. We need to give fish populations time to grow so anglers now and in the future can fully enjoy the sport that made Wisconsin famous. Moreover, I don't believe that anglers have to expect large bag limits to thoroughly enjoy each fishing experience.

By keeping fewer fish today, anglers will help us bank on good fishing in years to come. We're asking anglers to think of catch-and-release as an investment. You leave a little something in the account and, over time, that small sum grows in value. It takes patience and a sustained commitment to a strategy, but the dividends of conservation benefit all anglers. With professional fisheries managers, technicians and crews working with dedicated anglers,



we can expect a high return on our investment.

The new trout regulations follow this savings account analogy. By categorizing streams and assigning more restrictive size and bag limits, trout anglers gradually will see increases in both numbers and size of trout in many streams across the state. At the same time, we've kept liberal bag limits on tiny brook trout streams across the north where fish grow slowly. On those waters, fishers can still take 10 trout a day *with no size limit*. Trout anglers choose the kind of fishing experience they want. I'd like to offer a similar variety of opportunities on our lakes and warmwater rivers.

How does the notion of a fish savings account apply to lake fishing and walleyes? Heavy sport fishing by anglers and spring spearing by Chippewa tribes draw on Wisconsin's walleye deposits. To keep the account solvent, state and tribal fish managers carefully control which walleyes and how many walleyes can be caught and kept.

Spearing is a closely regulated, intensive harvest method. Safe harvest levels are set before the season by state and tribal fishery biologists.

Thousands of sport anglers fishing walleyes 10 months a year also affect fish stocks. If those anglers supported lowering bag limits and raising size limits for walleye, fishing would improve in the ceded territory.

Yes, spearing is controversial, but let's keep it in perspective. In 1990, tribal spearers harvested fish on only 119 of the thousands of lakes, ponds, rivers and streams offering good fishing in this state. If we put the controversy behind us and get on with life up north, we'll all have more time to fish. I urge you all to stay away from the boat landings in 1991. I'll be at home myself, oiling my reels and readying my equipment for the May 4th opener.

Fisheries are resilient when we give them a chance. The recent decision to place a 15-inch size limit on walleyes is a good example. In 1990, walleyes taken from lakes with these new regulations averaged over 18 inches in length compared with 14.8 inches in lakes exempted from the 15-inch limit. It took three times as long to catch a legal fish on lakes with new limits, but that was the whole idea. By reducing the number of fish removed we will build up the stocks and you will *catch and see many more fish* than you did in the past. If you get 40 strikes, catch 30 walleye and keep two, isn't that good fishing?

Musky fishers understand this concept better than any other Wisconsin anglers. They even led the way for DNR professionals by encouraging voluntary catch and release of muskies. That selfless effort has been a key factor bolstering musky populations. New musky size limits proposed for 1992 will create numerous trophy waters. Musky anglers across the state reviewed and supported the limits this fall. ("A trophy within reach" in this issue outlines the proposal.) The future of musky fishing is terrific!

Walleye tourney on Lake Winnebago. The pursuit of cash and prizes adds additional fishing pressure as anglers zero-in on one species. Many contests now require contestants to catch-and-release their entries.

DEAN TVEDT

Plugs, spoons and plastic worms make way for scented baits and electronics in some anglers' arsenal. DNR PHOTO

Bass fishers are close behind in protecting their favorite fish. Bass anglers' enthusiastic support for new size limits will promote larger numbers of bigger bass.

Informed anglers and the DNR professionals are striving to build up our fisheries by reducing harvest. But we can't do it alone. We need the support and cooperation of every angler to be successful. I am convinced this will work!

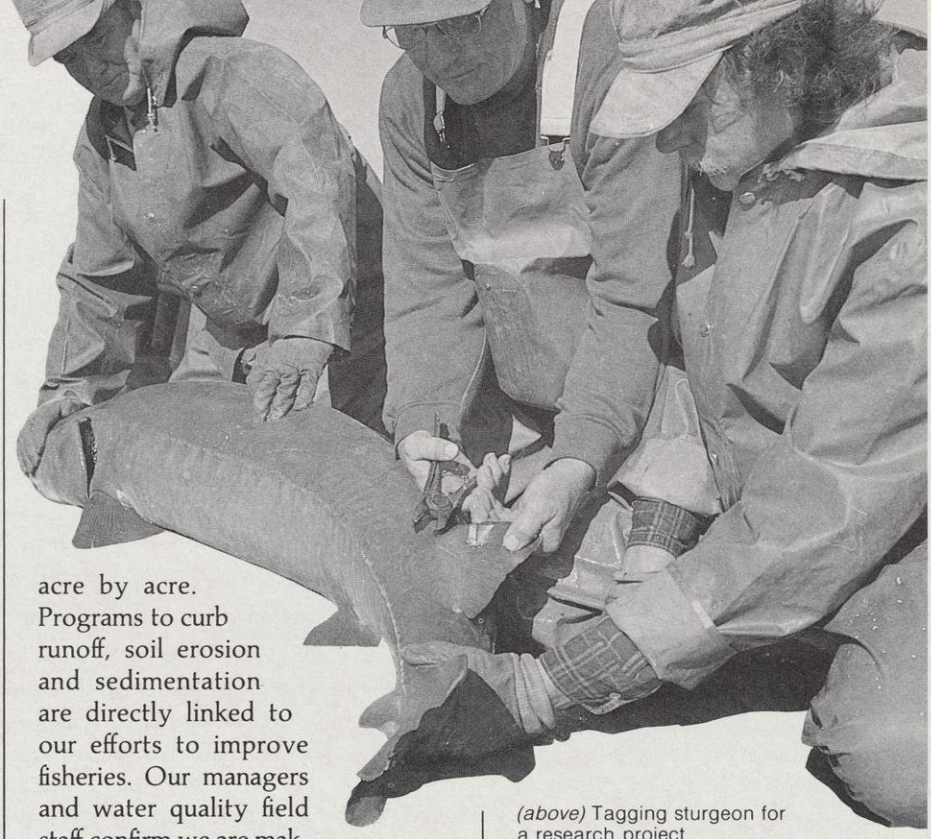
In the meantime, the Bureau of Fisheries Management will continue

its nationally recognized programs. Buying land, building accesses to lakes and streams and creating more productive fishing habitat is the most visible part of our plan. In partnership with environmental programs and communities, we're rehabilitating fisheries in previously polluted waters like the Wisconsin and Fox rivers. We'll produce better walleye and musky fingerlings when our new hatchery improvements are completed. Introducing new strains of fish like steelhead in Lake Michigan has picked up some of the slack in our salmon fishery. Huge lake renovation projects like last year's work on Delavan Lake will produce thousands of hours of exciting fishing beginning in 1992. Our aquatic education program teaches young people to fish and appreciate the environment should pay big dividends in the future.

Contaminants remain a challenge in some waters — DNR environmental staff are working on solutions to resolve past problems while cutting the flow of new contaminants in lakes, rivers and streams. Environmental conditions are improving, and fish from many hundreds of our lakes and streams are as safe and wholesome as any food you can buy in a supermarket.

We are still losing habitat through wetland dredging and filling. We must continue to fight these losses acre by acre. Programs to curb runoff, soil erosion and sedimentation are directly linked to our efforts to improve fisheries. Our managers and water quality field staff confirm we are making progress across the state, and many of our streams are running clearer and purer. Still, many more rivers, especially those in cities and villages, could offer better fishing, better recreation and quality relaxation closer to our homes.

Does all this mean that in the future you should be ashamed to kill a couple of 16-inch walleyes and eat them? Absolutely not! Our waters can and should produce a surplus of fish for people to eat and enjoy. As a group, anglers just need to show some moderation and be satisfied keeping two or three game fish a day instead of a limit of five. We'll be rewarded with more action out on the water and we'll catch larger fish.



DEAN TVEDT

(above) Tagging sturgeon for a research project.

(right) Cane poling for perch from a Lake Michigan pier.

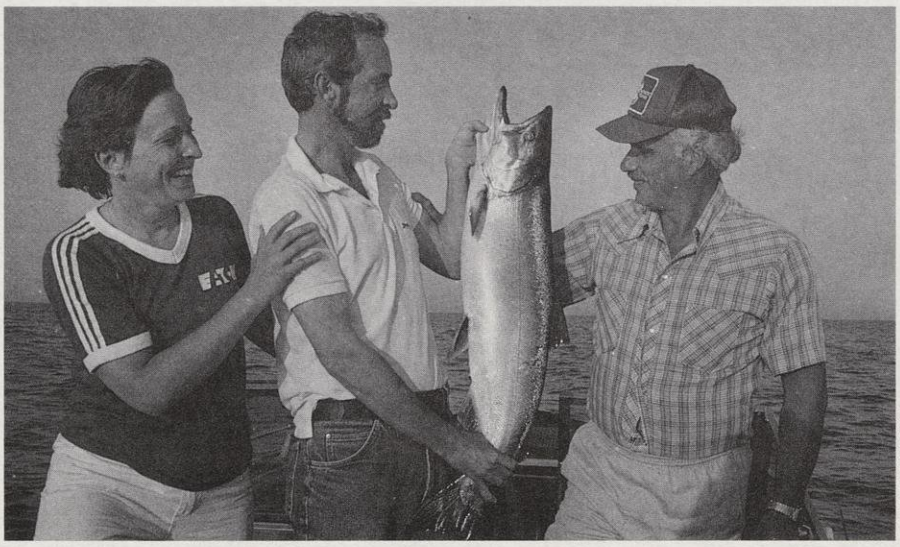
There's one final request I'd make of anglers: Take an interest in young people. Take children fishing and introduce them to the sport's many joys. Show them the red eye of a rock bass. Point out the electric blue lines on a sunfish's cheek. Enjoy our waters from the banks and offshore. Experience a misty bay in the morning. Take a quiet tromp around a city pond or along a trout stream bank. Feel the satisfaction of docking a boat after a great day on the water. We live in a beautiful place and it's young people who will keep it that way, if we teach them.

Now you know how I feel about the future of Wisconsin fishing. I look forward to meeting and working with as many of you as I can. I encourage you to call upon our fishery managers, technicians and crews across the state to share your ideas. Together we can really make a difference. □

Lee Kernen

Lee T. Kernen directs DNR's Bureau of Fisheries Management.

Better fishing is their profession and their pleasure. Fisheries Management staffers Peg O'Donnell, Carlos Garces and Lee Kernen caught this beautiful chinook salmon on a summer outing.



TAMMY A. PETERSON

ROBERT QUEEN

CATCH A GLIMPSE

Tammy A. Peterson

Shiocton, New London, Northport, Shawano . . . names that conjure up visions of cozy, rural towns, dairy barns, cheese factories and sporting goods stores dotting the Wolf River valley. Here, the fishing is good, the hunting is better, and the living is easy.

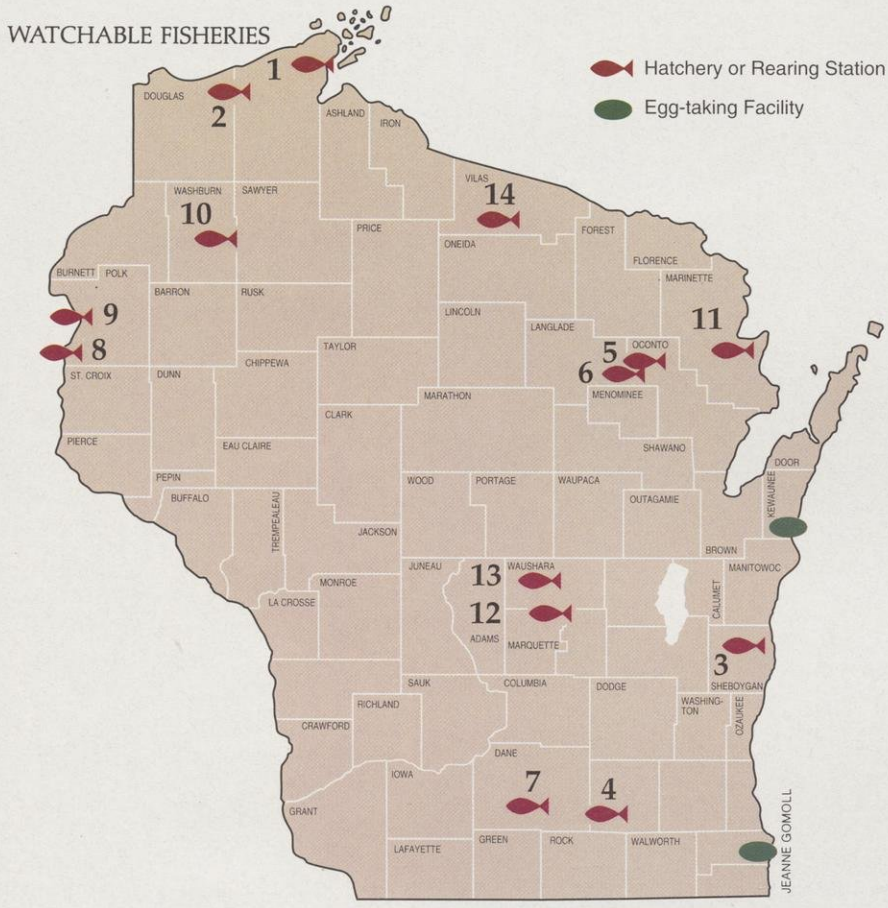
Except in April.

Then these quiet, riverside towns become staging grounds for one of the world's spectacular natural displays.

Deep in the cool river currents just out of view, hundreds of prehistoric creatures lurk, waiting for the exact moment to make their move. Sometime around the 15th of April, when water levels and temperatures are just right, armor-plated, torpedo-shaped giants appear in the rocky shallows of the Wolf and Fox rivers. In an ancient ritual, shark-like tails thrash the surface, knifing and propelling these Mesozoic remnants into front-page news.

Hundreds of volunteers and law enforcement specialists line the banks to ensure a safe journey for these primeval visitors. Reporters and journalists eagerly await their arrival and vie

Sturgeon spawn just a few feet away in the Wolf River shallows every spring.
DAVID CREHORE



	FACILITY	TELEPHONE	Hatches Eggs	Type of Fish	Live Fish Display	Restrooms	Picnic Area	Seasonal Operation*
1	Bayfield	(715) 779-5430	●	●		●		
2	Brule	(715) 372-4820	●	●		●	■	
3	Kettle Moraine Springs	(414) 528-8825	●	●		●		
4	Lake Mills	(414) 648-8012	●	●	●	●	●	
5	Lakewood	(715) 276-6066		●		●		
6	Langlade	(715) 882-8757		●		●		
7	Nevin	(608) 275-3246	●	●			●	
8	Osceola	(715) 294-2525	●	●		●		
9	St. Croix Falls	(715) 483-3535	●	●		●	■	
10	Spooner	(715) 635-4147	●	●	●	●		●
11	Thunder River	(715) 757-3541		●		●		●
12	Westfield	(608) 296-2343	●	●		●		
13	Wild Rose	(414) 622-3527	●	●	●	●	●	
14	Woodruff	(715) 356-5211	●	●	●			●

KEY

● At hatchery

■ Nearby

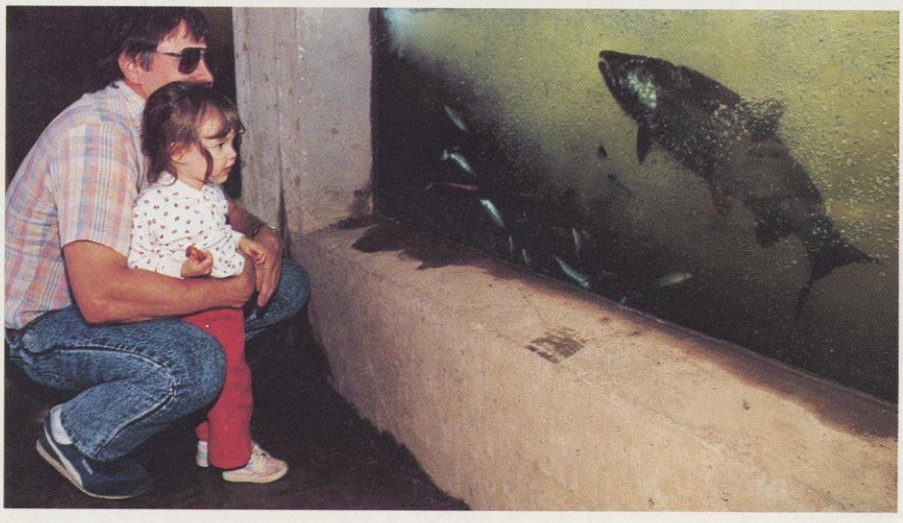
* No fish on premises during winter

TYPE OF FISH

Coldwater

Cool/warmwater

Both



DWIGHT NALE, COURTESY OF THE POST-CRESCENT, APPLETON

for the first glimpse. Biologists and researchers stand poised at the ready to quickly tag, measure and weigh the freshwater leviathans. Thousands of curious onlookers witness this rare and spectacular sight: the annual spawning run of Winnebago lake sturgeon.

The Wolf River may be the only place in North America to view these spectacular fish during their spawning migration. Rock riprap, placed along sandy bends to prevent erosion in the shallow river, provides prime habitat. In the early 1950s, the Wisconsin Conservation Department began monitoring fish populations and documented seven spawning sites for 12,000 lake sturgeon in the Winnebago system. Today, with riprapped shores, intensive law enforcement to thwart poachers seeking the valuable roe, a ban on gill netting and an extensive research program, more than 40,000 lake sturgeon spawn at 50 sites along the Fox and Wolf rivers.

The Wisconsin Department of Natural Resources cordially invites you to pull up a front row seat to this watery performance and many other natural events in lakes and streams throughout the year. Fish are fascinating creatures with fascinating habits. From the 100-pound lake sturgeon to trout and salmon running in Great Lakes tributary streams, Wisconsin offers myriad opportunities for families and friends to take in a "finned feature."

At 14 hatcheries and fish production stations throughout the state, visitors can see fish zoom through their formative years. New placards and exhibits at all 14 sites make the state hatcheries excellent spots for fish watching.

Other notable places to catch fish and fish crews in action include egg-taking facilities on the Kewaunee and Root rivers. Underwater viewing windows at both of these locations

(top left) Visit a hatchery or watch when fish eggs are collected seasonally.

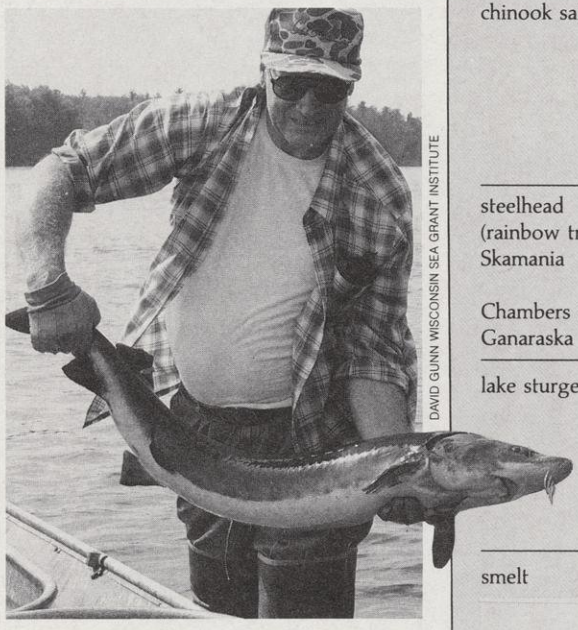
(bottom left) Take a gander at migrating salmon from the bottom of the fish ladder, Kewaunee egg-taking facility, Dana Farms County Park west of Kewaunee.

give visitors an up-close and personal view of chinook and coho salmon, brown and steelhead trout, suckers and bass.

Big Rock County Park on the Sioux River near Washburn offers excellent steelhead viewing in April and May; brown trout, coho and chinook salmon provide the thrills September through November.

Roadside exhibits will be constructed at several locations along the Wolf River next year. Curious onlookers will better understand the sturgeon's life history, management and protection.

The two million people who annually purchase fishing licenses in Wisconsin already know the thrill and excitement of catching a fish, or merely catching a glimpse. Join their adventure. Experience the splendor of our underwater world.

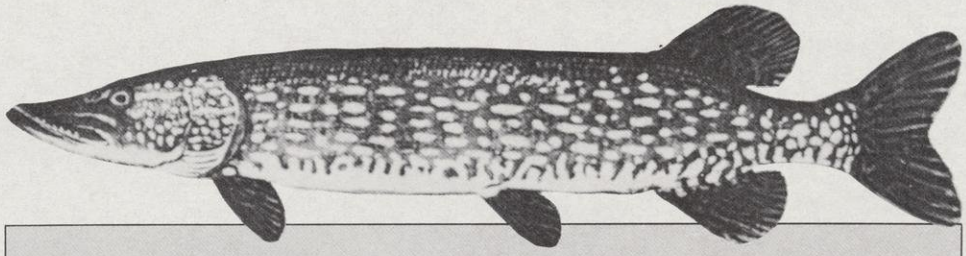


DAVID GUNN WISCONSIN SEA GRANT INSTITUTE

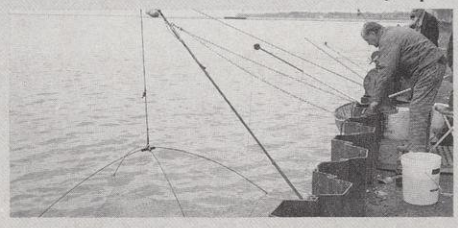
Retired Fish Manager Dan Folz still keeps his hands in sturgeon research when the big fish run the Wolf River.

For more information on sturgeon watching, or fish watching in general, call or write: Aquatic Education Program, Bureau of Fisheries Management, 101 S. Webster Street, Madison, WI 53707. (608) 266-2272.

Additional fish watching opportunities are listed in the following table. □



SPECIES	DATES	LOCATIONS
brown trout	late September-November	Big Rock Park on the Sioux River in Washburn Kewaunee River egg-taking facility*
suckers	April-June	Peshtigo River in Peshtigo at the railroad bridge Kewaunee River egg-taking facility*
northern pike perch	April-June	During high water, flooded ditches adjoining Green Bay hold spawning fish. County Line Road adjoining Brown and Oconto counties provides good viewing.
coho salmon chinook salmon	October-November September-October	Kewaunee River egg-taking facility* Root River egg-taking facility** Holiday Inn of Racine at the Horlick Dam Quarry Park in Racine Pikes Creek Dam in Bayfield. Park at the Bayfield hatchery and follow the trail. Big Rock Park on the Sioux River near Washburn
steelhead (rainbow trout) Skamania Chambers Creek Ganaraska	 January-February March late April	Lake Michigan tributary streams on the Root River (Racine), Kewaunee River (Kewaunee), Menominee River (Menominee), Peshtigo River (Peshtigo) Big Rock Park near Washburn
lake sturgeon	mid April-early May***	Highway X crossing of the Wolf River between New London and Northport Shawano Dam on the Wolf River in Shawano Shiocton along Highway 54 near "Bamboo Bend"
smelt	late March-early April	Red Arrow County Park in Marinette east shore of Green Bay at the Red River in Kewaukee County Oconto fishing pier Highway 41 bridge between Marinette and Menominee public boat landings along the Lake Michigan coast public beaches and landings near Ashland



DNR PHOTO

* Dana Farms County Park west of Kewaunee at the junctions of county highways C&F

** in Lincoln Park, Racine

*** Sturgeon are visible for a few days when water temperatures are just right. For an accurate update on the sturgeon spawning run, call the DNR's Oshkosh office, (414) 424-3050.

Tammy A. Peterson leads DNR's aquatic education program. She encourages anglers and nonanglers to enjoy annual fish rituals.

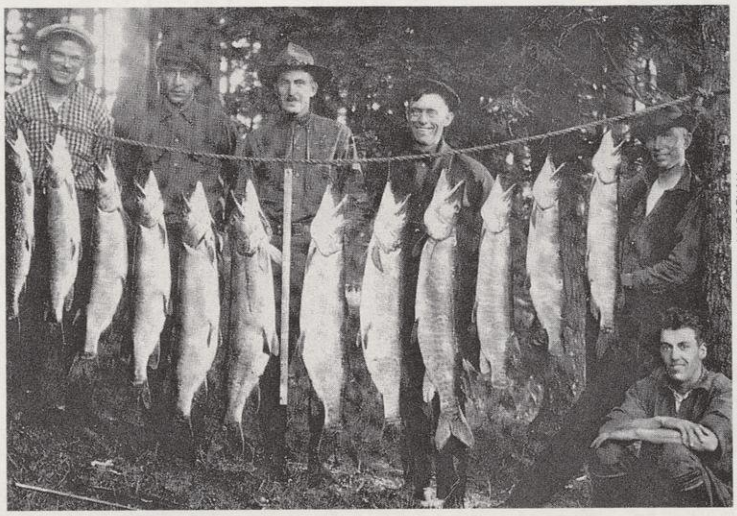
DAVID MARSHALL

New size limits for musky aim to strengthen naturally reproducing populations while keeping a gleam in every angler's eye.

A trophy within reach

Terry L. Margenau, Steve P. AveLallemant, Dennis K. Scholl

Meet the muskellunge: a lean, mean fightin' machine that's the most sought-after trophy fish in the state. The library of fish fiction features tales of 100-pound-plus specimens lying in wait, ready to haul unwary anglers out of boats or consume small poodles in one swallow. Even the true feats of *Esox masquinongy* are legendary. But without a little help, it's possible that the official state lunker will dwindle to a hollow legend in its own time.



ARTICLE PHOTOS COURTESY OF TERRY L. MARGENAU

The days of lunker musky poles are long gone. Avid musky anglers were the first to realize their favorite quarry needed special protection. Anglers promoted catch-and-release fishing and size restrictions.

In Wisconsin, as in other neighboring states and Canadian provinces, the musky is managed as a trophy fish. Regulations such as season length, bag and size limits maximize chances that an angler will catch a musky about as long as a yardstick or as heavy as a 20-pound sack of spuds.

A steady decline in catches of 40- to 50-pound monsters, however, told biologists and anglers that all was not well with the fearsome underwater fighters. The big fish couldn't hold out against the combined forces of increased angling pressure, sophisticated fishing equipment, loss of habitat and competition from other species — notably the voracious northern pike. For once, muskies were on the losing end of the line.

Sizing up the situation

Present regulations for most musky waters in Wisconsin include a 32-inch minimum size limit, a daily bag limit of one, and a season open from late May through November. Except for minor changes in season length and minimum size, these regulations have been in effect since the 1930s.

DNR fisheries biologists believe a new lake category system will better protect and improve musky populations while providing anglers with opportunities to catch the really big ones. The idea is to put all musky waters of Wisconsin into one of the following categories:

Category 1: 36-inch minimum length limit on all lakes not covered in categories two and three.

Category 2: 40-inch minimum length limit on specified waters listed by county. Lakes selected for this category include some of Wisconsin's finest musky waters.

Category 3: Special regulations on a limited number of waters listed by county. Some lakes and rivers will be candidates for a 45-inch "trophy only" size limit. Others would retain the current 32-inch minimum, because researchers believe few fish in these waters will grow to a 36-inch or greater length.

Lakes would be placed into categories based on observations and recommendations from fish managers working in cooperation with public

conservation groups. We expect about 80 percent of Wisconsin's lakes would fall into the 36-inch size limit category while about 20 percent would be regulated by a 40-inch size limit. The few remaining lakes would be regulated with a 32-inch or 45-inch size limit.

Categorically speaking

Each lake or river is a biologically unique world unto itself, a special mix of animal, vegetable and mineral subject to scores of natural forces and human foibles. So how do we decide how to categorize a lake? A number of factors are taken into account. One thing we'll be looking at is the musky growth rate.

The growth of muskies in a body of water tells a lot about the dynamics of a lake or river. Too many small muskies in a water may mean there's too much competition for food from other species and other muskies. Nobody goes hungry, but without the right kind, the right size and the right quantity of forage fish, muskies grow so slowly that they probably won't reach trophy size.

Since musky depend primarily on sight to capture prey, they sometimes have difficulty feeding in dark or murky waters. Yet some of Wisconsin's most turbid lakes are also great muskie lakes because the nutrient-loaded water produces plenty of good forage fish. Conversely, some of our clearest and coldest lakes may not have enough food fish to satisfy hungry muskies. Then again, some of our deep, cold lakes are home to the biggest and oldest muskies of all.

Even if two lakes are side-by-side, they won't necessarily produce the same quantity or quality of muskies. When it comes to the muskellunge, each lake or river is different! Under the category system, each water will be assessed individually for its potential to produce muskies of a certain size. The opinions of people living around musky lakes and rivers will help DNR staff decide how these waters should be managed.

What's a "trophy"?

You know the old saw: One angler's monster is another angler's minnow.

To someone who has never caught a musky, hooking a 36-incher is akin to reeling in Jaws. On the other hand, a more experienced angler might confer trophy status only upon a musky near or over the official state record of 69 pounds, 11 ounces.

To get a better idea of what a "trophy" musky is, the University of Wisconsin and DNR polled more than 1,000 anglers who ply Wisconsin waters for the fish. Nearly all (98 percent) of the respondents said a musky must be at least 40 inches long before they'd consider it a trophy specimen. About 40 percent said a trophy was 50 inches or larger. If muskies are to be managed as a trophy fish in Wisconsin, the numbers suggest that efforts should be geared toward increasing the numbers of fish over 40 inches.

Musky anglers also favored higher size limits. Over 60 percent of the anglers polled favored a change to a 40-inch limit on most waters of the state while less than 30 percent opposed the idea. The proposed size regulation, including categories both above and below 40 inches, promises satisfaction for both groups. "Trophy" doesn't necessarily translate to "wallhanger": Catch-and-release fishing is the standard among musky anglers today. Nearly 80 percent of legal-size musky are being released to fight another day — evidence that memories are the most valued trophies of all.

Making more muskies

Fish biologists expect to improve the chances of successful spawning by protecting adult muskies longer. Males reach maturity at four to five years of age, when they are 28 to 31 inches long; females mature at five to seven years, at 30 to 36 inches. Researchers have a hunch that older, more "experienced" spawning fish are more successful than fish spawning for the first time. Larger size limits would protect spawning muskies for two or more seasons, depending on the lake's category.

Larger size limits may help self-sustaining musky populations thrive. Greater numbers of adult muskies in a lake mean more spawners will be present and, therefore, more eggs laid in springtime. Only a few lakes remain in Wisconsin where muskies can replenish their own numbers. Without protection, these populations face uncertain futures and may require stocking.

Improving natural reproduction is a worthwhile goal. DNR stocks about 150-175,000 musky fingerlings each year, and it costs about $2.85 per fish — nearly $500,000 annually — to bring musky fingerlings up to stocking size. Raising these hearty eaters can put a sizeable dent in the pantry: It takes 3½ to five pounds of live fish food to produce a pound of flesh on a muskellunge.

The mortality rate for stocked fingerlings is high. On average, 60 percent of the young fish die within four weeks of stocking, usually preyed upon by northern pike, great blue herons and other species. Only 25 percent of stocked muskies survive to swim beyond their first birthdays in the spring.

Stocking may also weaken natural populations. The gene pool of a self-sustaining musky population develops over time in response to the unique conditions of the home water. By interbreeding with stocked fish that may lack unique genes, muskies in natural populations may lose the ability to survive in a specific lake or river.

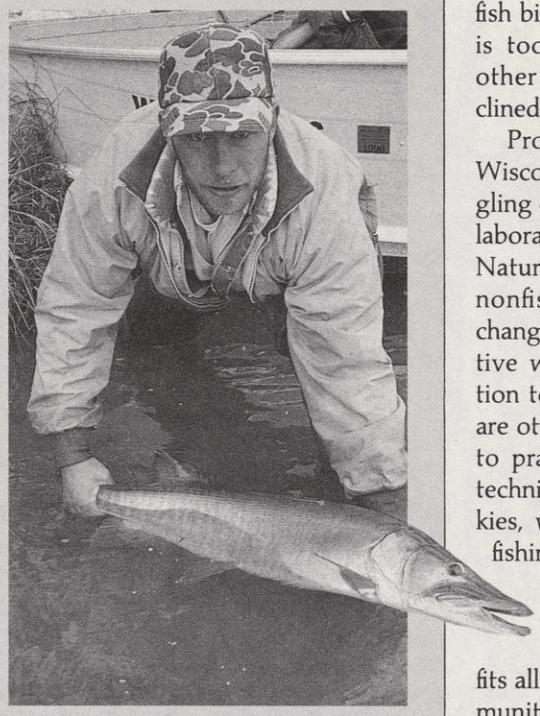
If natural reproduction can be improved in some lakes with the help of size limits, the hatchery-reared fish can be diverted to waters where stocking is absolutely necessary to maintain a musky fishery.

Muskies for the future

Twenty years ago it took 100 hours or more on the water for an angler to catch one musky. Thanks to high-tech fishing gear, the average angler today spends less than 80 hours to get a productive strike. Three-dimensional depth finders, electric trolling motors and detailed lake maps are now found in the boat alongside old-fashioned bucktails, spoons and jerk-baits, allowing both experienced and novice musky anglers to pursue their elusive quarry with increasing success.

Anglers, however, have shifted toward conserving muskies. According to a 1990 DNR outdoor recreation survey, the overwhelming majority of the 25,000 anglers who prefer to fish for muskies practiced catch-and-release. But nearly 96,000 regular anglers caught muskies in 1990. Even with catch-and-release, fish biologists fear the musky harvest is too high, and musky clubs and other conservation groups are inclined to agree.

Musky are gently bagged and weighed as part of a musky genetics study in northern Wisconsin.



Finding release

The best thing a musky angler can do to protect muskies is to practice proper catch-and-release techniques. Follow these tips carefully and the legal or undersized musky you return to the water unharmed today may be the lunker you catch in the future:

1. Play the fish only as long as necessary.

2. If possible, don't remove the hooked fish from the water. Release it while it's in the water. If you must bring a musky into the boat, lay it on a wet, soft surface and keep the fish moist.

3. Remove the hook with long-nosed pliers. If removing the hook could injure the fish, just cut the hook from the line or lure and leave it in the fish. It will dissolve gradually and cause no harm.

4. Never hold a musky by the eye sockets or gills.

5. Once the hook is out, hold the fish in a normal swimming position in the water and move it back and forth if it is breathing slowly. Hold the musky until it can remain upright by itself and its strength returns.

Protecting the musky resource in Wisconsin while allowing quality angling opportunities requires close collaboration among the Department of Natural Resources, anglers and the nonfishing public. The size limit change is the simplest and most effective way to provide needed protection to musky populations, but there are others. Encouraging more anglers to practice proper catch-and-release techniques, especially for large muskies, will help ensure quality musky fishing in the future.

Controlling nonpoint source pollution to improve musky spawning habitat benefits all species. Lake districts and communities can take an active part in regulating shoreline development, monitoring septic systems, protecting wetlands and preventing fertilizer runoff to maintain good spawning areas.

Anglers have the opportunity to show their support for the proposed musky regulations at the 1991 spring conservation hearings, held in each of Wisconsin's 72 counties on April 22th. To find out where your county's spring hearing will be held, contact a warden at your DNR district office.

The days when musky were primarily harvested for the frying pan are long gone. Out of necessity, we manage muskies today as trophy fish. True to their lofty position, muskies encourage hours of enjoyment on Wisconsin waters, inspire awe in nature, and strike just a touch of fear in the hearts of armchair casters. By protecting musky populations with size limits and improving habitat, more anglers will experience the first-class freshwater thrill of challenging a living legend. □

Terry Margenau leads fisheries projects for the DNR Bureau of Research from his base in Spooner. Steve AveLallemant is DNR's fish manager for Forest County. Dennis Scholl is a DNR fish manager in Iron and Ashland counties.

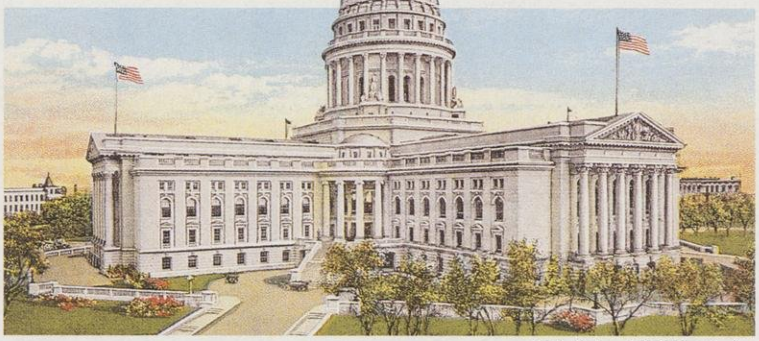
WISCONSIN TRAVELER

APRIL 1991

INSIDE

VOLUME 3 NO. 2

STATE CAPITOL



E.A. Bishop Publishing, Racine

Capitolism

A dance hall, a church, a theater, a funeral parlor. Yes, and a pig sty, too. In the early days Wisconsin's State Capitol was used for just about everything except legislation. Prideful Madisonians, who felt their slender isthmus between four lakes an ideal spot for the seat of government, had to wait while Belmont, Wis. and Burlington, Iowa served briefly as territorial capital. Finally, in 1838, the first of three Madison capitol buildings sprouted from the knoll in the center of town. Yet the honor of "capital city" was by no means guaranteed.

They said the new building looked like a toad squatting in the grass. They called its tin dome an inverted washbowl. Detractors of Madison, a crude frontier town, repeatedly tried to convince fellow legislators to move the seat of government to someplace civilized — Milwaukee, for instance. But the deed was done. Although the roof leaked and it cost twice as much as to build as originally estimated, the capitol was in Madison to stay.

The structure was not without charm. A thoughtful superintendent converted the basement from a hog house to offices, added a gothic brick outhouse for the convenience of the lawmakers and planted a few trees on the grounds in 1846.

Despite the refinements, the building could not meet the needs of a growing state. Plans for enlargement surfaced in 1857 and the reconstructed capitol was completed in 1863.

To paraphrase a well-known statesman of the era: "You can't please all of the people all of the time." Citizens and legislators tolerated the refurbished building until 1903, when a commission was appointed to plan another expansion.

A gas lamp eased the commission's task. About 2:45 a.m. on Saturday, February 27, 1904, the lamp touched off a fire in a south wing cloakroom. By the time the sun was up, most of Madison's second capitol was smoldering ash.

Capitol number three — the one standing today — is the product of a 1905 competition. An elegant, formal plan designed by a New York architectural firm claimed the $10,000 prize. Ground was broken in 1907 and construction completed in 1917, at a cost of $7 million.

Any Wisconsinite will tell you it was worth every penny (especially when residents from other states are

Continued next page

Gilty!

At 15′4″ and 6,000 pounds, she's no candidate for Miss America. Which suits the people of Madison just fine. They wouldn't have **Wisconsin** traipsing cross-country; they like her where she is, where she's been since 1914 — atop the Capitol dome.

After celebrated American sculptor Daniel Chester French cast the embodiment of the Badger State in bronze and wrapped her in a coat of gold leaf, a great debate arose: Which way should Wisconsin face? Some said west, toward the new university. Others suggested east, where she could greet the rising sun. Few mentioned south (the sun would be in her eyes) or north (brrrr). Today she looks to the southeast, facing Lake Monona and welcoming all to the official "front door" of the building on Martin Luther King Jr. Boulevard.

Time and the elements are as unkind to metal as they are to flesh. Wisconsin was regilded in 1932, 1957 and 1990. Her new 23 1/2-karat raiment is truly a sight to behold.

Anton W. Rajer

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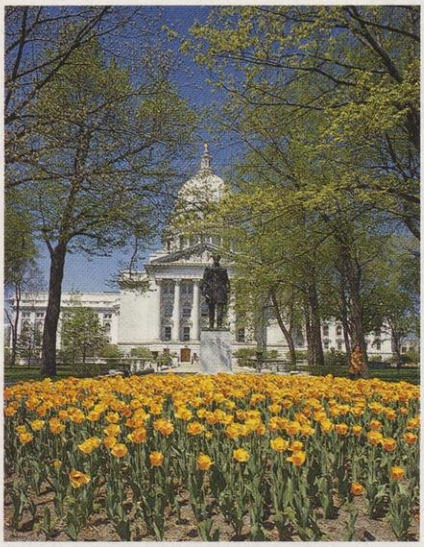


A spring day reveals Wisconsin's State Capitol in all its glory. DNR photo

within earshot). The interior of the only granite-domed state capitol in the U.S. features 43 varieties of marble and stone from around the world. Mosaics, stained glass skylights, finely carved wood furniture and historical murals add an air of refinement. The breathtaking sight of Edwin Blashfield's circular mural "Resources of Wisconsin" greets visitors who glance up two hundred feet to the center of the dome.

And then there's Wisconsin herself. The lady who sports a badger hat stands in golden silence atop the granite dome, urging all to follow the state motto, "Forward."

Excuse the brag, but *Traveler* says Wisconsin's State Capitol is by far the fairest in the land. Regular free tours are offered year 'round seven days a week, beginning at the ground floor information desk.

For tour information, call (608) 266-0382. Read more about frontier days in the capital city at the State Historical Society Library, 816 State St., Madison, (608) 262-3421. To plan a Madison vacation, call the Greater Madison Convention & Visitors Bureau, (608) 255-0701 or the Wisconsin Division of Tourism, 1-800-432-TRIP.

A real stitch

A Drunkard's Dream. A Wedding Ring. Grandmother's Fan. The Log Cabin. And down to the last detail, a Wandering Snail. You'll find them all at the **Amherst Quilt & Consignment Auctions**, Saturday, May 18th and Saturday, August 24th on County Highway A, three miles south of Amherst in Portage County. Antique furniture and housewares catch the attention of bidders, but the quilts — individual interpretations of traditional patterns hand-sewn by Amish women from around the country — are the main attraction. Amish women of the Amherst area serve lunch and hold a bake sale on the grounds. Inspection opens at 7 a.m. and the auction begins at 9 a.m. Free admission.

Opening the outdoors

Nature presents no obstacle to people with disabilities at many Wisconsin state parks and forests. Continued improvement in trails, campsites and other park amenities means more of the outdoors will be accessible, especially for those with mobility impairments.

Here are a few destinations to consider:

Pattison State Park, 13 miles south of Superior, has a paved path leading to a magnificent view of 165-foot Big Manitou Falls, the highest waterfall in the state. Excellent campsites and a wheel-in shower make this park a good choice for an extended stay. (715) 399-8073.

Everyone can be a little closer to nature in a Wisconsin state park. DNR photo

Willow River State Park, six miles northeast of Hudson, offers outstanding birding on paved walkways — more than 200 species have been sighted at the park located along the Mississippi Flyway. Yellow perch, northern pike and largemouth bass are reputed to lurk near the easy-access fishing pier. (715) 386-5931.

Point Beach State Forest, five miles northeast of Two Rivers, brings the Great Lakes into focus at picnic areas and campsites overlooking Lake Michigan. An accessible nature center allows closer examination of the sights, sounds and smells of Wisconsin's East Coast. (414) 794-7480.

Mirror Lake State Park, five miles southwest of Wisconsin Dells, enjoys a well-deserved reputation for excellent facilities including an accessible fishing pier and boat landing. This spring, the Telephone Pioneers of America and several private businesses will build a rustic cabin in the park for people with disabilities. The simply designed, barrier-free building with modern bathroom fixtures is scheduled to open in June. Campers who want to use the cabin must fill out a reservation application and mail it to Mirror Lake. Call (608) 254-2333 or write Mirror Lake, Rt.1, Box 283, Baraboo 53913.

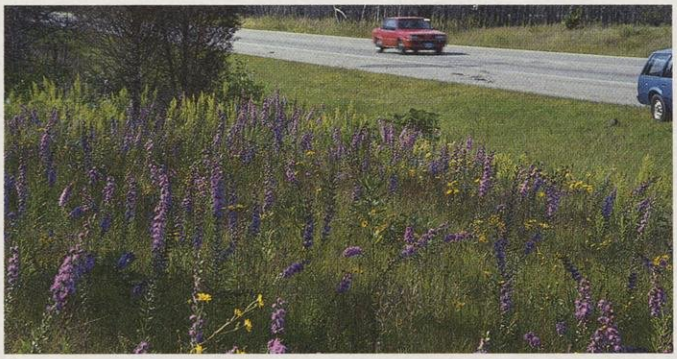
Bicycles aren't the only wheels welcome on Wisconsin's state park trails — there's room for wheelchairs, too. Gentle gradients and firm crushed limestone surfaces guarantee a safe trail ride.

With accessible facilities at all Interstate and freeway rest areas and at waysides along major highways, you'll enjoy traveling to and from Wisconsin's state parks.

If you need any assistance during your stay at a state park, just ask the park superintendent and staff. They'll be glad to help.

"A Guide for the Mobility Impaired to Wisconsin State Parks, Recreation Areas, Forests and Trails" is available free from the Bureau of Parks and Recreation, P.O. Box 7921, Madison WI 53707. Call (608) 267-7490 (voice) or 267-2752 (TDD).

Highway masterpieces



Roadside prairies: Colorful reminders of a graceful living carpet that once covered two million acres in Wisconsin.

Jim Ritzer, Department of Transportation

Meet the three Great Impressionists: Renoir, Monet and the Wisconsin Department of Transportation.

Sacre bleu, mon Traveleur! Surely you jest!

Mais non, bon motoriste. DOT transformed Wisconsin's highways into works of art by planting prairie wildflowers and grasses along well-traveled roadsides beginning in 1975. Today, the view from a windshield reveals a landscape awash in purple blazing stars, yellow puccoon, pink lupines and the pearly haze of prairie smoke. It's as if the medians and shoulders were created with a broad stroke from a master's brush.

Highway prairies stand as colorful reminders of the original two million acres of prairie that existed in Wisconsin before the 1830s, mostly in the central and western parts of the state. On some roads in these areas, DOT did no planting but simply stopped mowing and let nature do the restoration work.

It takes from three to five years for prairie plantings to mature, but once they're established, a three-season colorama awaits motorists. Delicate lavender pasque flowers begin the show in April; bold purple prairie clover and gold prairie dock claim the summer months; blue fringed gentians bloom in fall. The shifting backdrop of big bluestem and needle grass changes from green to gold, blue and brown with the approach of winter.

These long-stemmed, deep-rooted plants enrich the soil, prevent erosion and provide habitat for birds and animals. There's another advantage: Roadside prairies eliminate the need for frequent mowing, saving tax dollars and freeing highway crews to handle more important road repair tasks.

Highway prairies: *Ca c'est une bonne idee!*

For a copy of "Conserving Wisconsin's Prairies," write the Wisconsin Department of Transportation, Box 7910, Madison WI 53707 or call (608) 266-3581.

Paul Peeters

The prairie returns

Listed below are a few of the locations where you can see highway prairies. You're sure to discover more on your Wisconsin travels.

- WIS 35 (The Great River Road) in Crawford, Vernon, La Crosse, Buffalo, Pepin and Pierce counties
- US 12 "South Beltline" in Madison
- US 41 in Winnebago and Outagamie counties
- US 51 between Portage and Wausau
- US 63 in Bayfield County
- US 141 between Crivitz and Pembine
- I-43, County V interchange south of Sheboygan
- I-94 between Warrens and Black River Falls
- I-90/94 between Wisconsin Dells and Camp Douglas
- I-94, Zoo interchange, Milwaukee County
- I-894, Hale interchange, Milwaukee County
- Rest areas on US 51 in Marquette County and I-90 in La Crosse

Almost major league

April 1991 finds the **Midwest League** entering its 43rd season of bringing the national pastime a little closer to home.

Wisconsin's four "single-A" ML baseball teams — the Madison Muskies, the Appleton Foxes, the Beloit Brewers and the Kenosha Twins — play each other and challengers from Illinois, Iowa and Indiana throughout the spring and summer.

Owned by major-league baseball clubs (the Oakland A's, Kansas City Royals, Milwaukee Brewers and Minnesota Twins, respectively), the single-A teams give aspiring ballplayers a swing at the big time. At minor-league prices, you'll see soon-to-be major-leaguers perfect their soon-to-be-notorious fastballs, double plays and line drives.

Madison Muskies

Intimacy is the name of the game at single-A parks: Smaller stadium size means every seat is a good one. (You'll be so close to the action that if you scratch your ear, the runner on first might steal second.) Players new to fame enjoy mingling with fans after the game. Single-A followers, though fewer in number, are as garrulous, partisan and prone to the charms of a mustard-slathered hot dog as their counterparts in the big leagues.

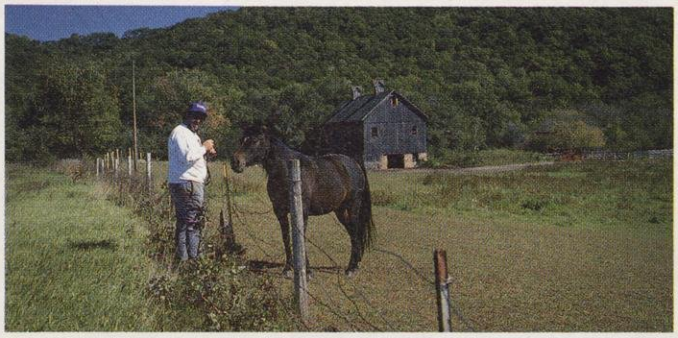
Take yourself out to the ballgame when a balmy summer's evening finds you in one of Wisconsin's single-A cities. Buy some peanuts and Cracker Jack. If the home team doesn't win it's a shame, but you'll have the time of your life at the old ballgame.

For park locations, schedules and ticket prices, call: Madison Muskies, (608) 241-0010; Appleton Foxes, (414) 733-4152; Beloit Brewers, (608) 362-2272; Kenosha Twins, (414) 657-7997.

Farm charm

You know the tune: "Old MacDonald had a farm, E-I-E-I-O. And on his farm he had some guests, E-I-E-I-O ... ." Whoa! Back up there a sec. Guests, you say? Shouldn't that be goats?

Not in the 1990s. In addition to making hay, Old MacD makes beds for visitors vacationing on his farm.



Engaging in a fenceline conversation with a new friend is just one of the many pleasures awaiting travelers who vacation down on the farm. Tracey Teodecki

Many Wisconsin farm families open their homes and barns to travelers curious about the rural way of life. Out in the barnyard, adults see the backbone of Wisconsin's economy in action while supermarket-savvy kids learn where food really comes from.

If your idea of relaxation includes manual labor, a farm is the place to unwind. Depending on the season and the farmer, guests can help plant corn, farrow pigs, milk cows, shear sheep, harvest fruit or muck out the barn. Other pleasurable on-farm exertions, such as hiking or cross-country skiing through a woodlot, farm pond fishing or ice skating, berry picking, bread baking, horse riding and sleighrides will leave you with a farmhand's appetite at day's end.

Folks seeking a retreat in the country will find that, despite the presence of the ubiquitous feathered alarm clock, most farms have corners of quiet solitude — places to think, read or contemplate the clouds and cows.

Vacation farms offer diverse lodgings. You may stay in the family farmhouse, or be put up in a renovated granary or barn. Three hearty squares a day are part of the package at some farms; at others you do your own cooking. With the help of Wisconsin's Division of Tourism, it's easy to tailor a farm vacation to your needs. E-I-E-I-O!

For a list of vacation farms, write for the "Wisconsin Recreation Guide," Wisconsin Division of Tourism, P.O. Box 7606, Madison, WI 53707 or call 1-800-432-TRIP.

Wisconsin Traveler is produced by Wisconsin Natural Resources magazine in cooperation with Wisconsin's Division of Tourism Development, Department of Transportation, and State Historical Society.

Make a Date

April 19-21:
Trivia Weekend, Stevens Point, Portage County. The 54-hour contest broadcast by radio station WWSP attracts players from all over the country, engulfing the community in three days of wholly worthless knowledge. (715) 346-2696.

April 30-May 20:
Festival of the Flowering Crab Trees, Delavan, Walworth County. The city blossoms when 7,000 crab trees bloom. Find the hot spots with a map from the Chamber of Commerce, 52 E. Walworth Ave. (414) 728-5095.

DNR Photo

May 5: Cinco de Mayo, Milwaukee. Celebrate Mexican Independence Day with music, food, games and cultural displays from 8 a.m. to 8 p.m. at Mitchell Park, 524 S. Layton Blvd. (414) 671-5700.

May 31-June 1:
Third Annual Great Wisconsin Cheese Festival, Little Chute, Outagamie County. Holy Mozzarella, Batman! (Or should that be Swiss?) Big Cheese parade, cheese carving, cheesemaking demonstrations, cheesecake competition and lotsa free samples. 5-11 p.m. Friday, 8 a.m.-11 p.m. Saturday, Doyle Park. (414) 788-7390.

For a Calendar of Events, write Wisconsin Division of Tourism, P.O. Box 7606, Madison, WI 53707, or call 1-800-432-TRIP. Dates and times of events listed in Traveler may change; avoid a hitch in your travel plans by calling ahead.

With this issue, Wisconsin Traveler comes to the end of a journey. As any traveler knows, without money you won't get far. Traveler got caught in the general belt-tightening when agencies sponsoring the publication faced shrinking budgets. That's adventure for you — you never know where it's going to lead. But thanks for joining us on the trip! Hope you enjoyed it as much as we did.

Maureen Mecozzi, Traveler Editor

A solid foundation for water rights

An environmental concept older than the Constitution protects your rights to water today.

David L. Sperling

On the rugged Lake Superior shores in Bayfield a developer must scale back a plan to build a string of condominiums because shops jutting out over the ice-blue waters would block the shoreline. On a northern Wisconsin trout stream, a fly-fisher casts for brookies, wading the waters that flow by homes, farmsteads and forests. On a small lake in southeastern Wisconsin, a sailor plies his tech dingy past fancy runabouts and half-a-million dollar homes.

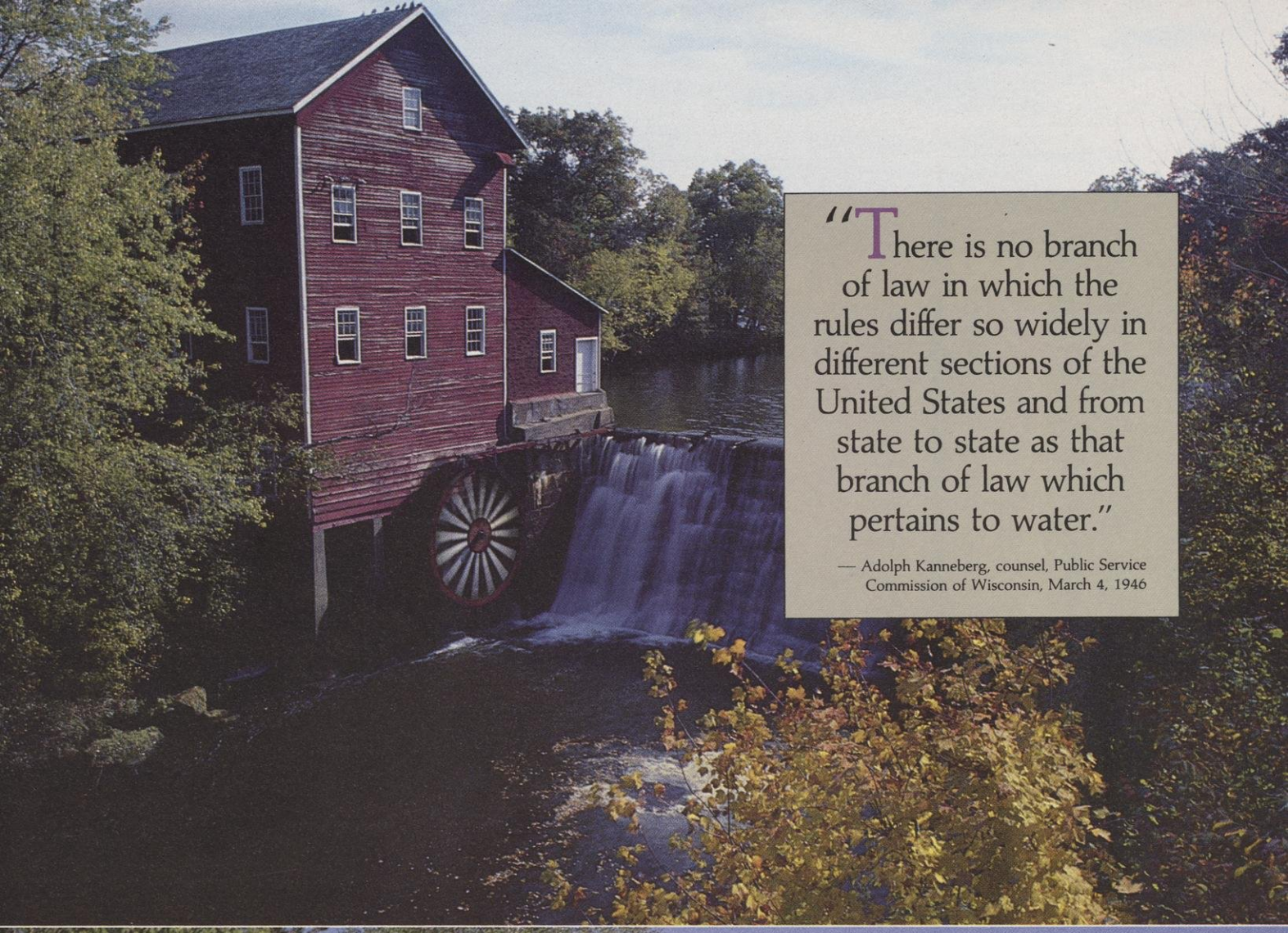
What protects your rights to these waters? An idea older than the U.S. Constitution that we are still forging, stretching, defending and interpreting in the 1990s. It's called the Public Trust Doctrine, a long-standing series of laws and court decisions defining our collective rights to use surface water.

The doctrine formed in the ashes of a new nation impoverished by the Revolutionary War. States were broke and they were looking for ways to raise taxes to pay for the war that freed their citizens from taxation. The land-rich states were especially pressed to help reimburse costs, rebuild battered cities and open the frontier. A three-year debate over terms to unite the nation ensued (Remember? Articles of Confederation 1778-1781). The states fiercely maintained their individual rights, yet they wanted assurances of equal rights as new territories were divided or developed.

Massachusetts and Virginia lay claim to the unsettled western territories north of the Ohio River, west of Pennsylvania and east of the Mississippi River. When ceding its western territories, the State of Virginia wanted assurances of rights to commerce and navigation on the lands it was giving up. Moreover, Virginians wanted to prevent the new states carved out of the Northwest Territory from imposing taxes or tolls on people who wanted to navigate these waters.

1792 Map of the Northern and Middle States showing the Northwest Territory published by J. Stockdale.

COURTESY OF THE STATE HISTORICAL SOCIETY OF WISCONSIN ARCHIVES (WHi H GX83 1792 A)



"There is no branch of law in which the rules differ so widely in different sections of the United States and from state to state as that branch of law which pertains to water."

— Adolph Kanneberg, counsel, Public Service Commission of Wisconsin, March 4, 1946

In an era of jets, rails and interstate highways, it's hard to appreciate the importance of rivers and connected lakes as transportation routes. Vast, unexplored lands had no roads and no maps. The waterways were the highways of commerce. The most important trade routes were the Mississippi River and the St. Lawrence. Two of the most important routes passed land that's now Wisconsin — the Fox and Wisconsin rivers linking the Great Lakes to the Mississippi, and Lake Michigan leading to the Chicago, Des Plaines and Illinois rivers.

Virginia ceded its territories on the condition that new states in the Union would have the same sovereignty as existing states and "the navigable waters flowing into the Mississippi and the St. Lawrence rivers and the carrying places between the same, shall be common highways, and forever free." Virginia's terms were accepted, the language was incorporated in the Northwest Ordinance of 1787, interpreted in the Wisconsin Territorial Law of 1836 and embodied in the State Constitution in 1848 (Article IX, Section 1). The rights to use navigable waters were to be held in public trust for all Wisconsin residents and other U.S. citizens.

Case closed? Story over? Hardly!

Interpreting this trust and defining "navigability" has taken as many twists and turns as a meandering stream. For instance, in Mississippi, navigable waters were those at least 25 miles long and deep enough to float a steamboat carrying 200 bales of cotton. Coastal states said rivers were navigable up to the point where tidal waters ebb and flow. Wisconsin and Minnesota first defined navigable waters as those that could float a saw log. Subsequent interpretations of public rights to waters were equally variable.

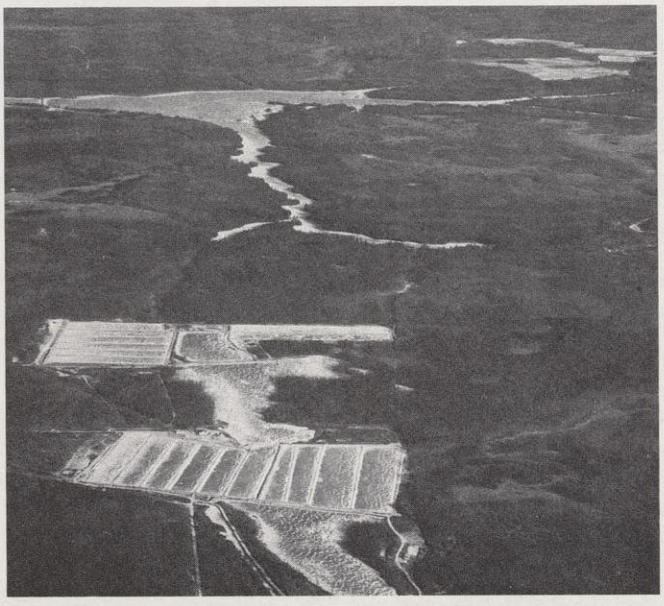
To appreciate how the doctrine is applied in Wisconsin, let's stroll through legal history as trappers, miners, loggers, settlers, farmers, canoeists, resorters and community developers fought water fights for water rights.

Territorial Wisconsin needed water for power as much as for nourishment. Grist mills ground grain, saw mills cut timber and other mills provided mechanical power. Hand and horse power could be spared where water could turn the economy. The Milldam Act of 1840 gave the owners of potential mill sites general rights to dam non-navigable waters and flood upstream lands without consent of the upstream land owner. However, the dam owner had to pay reasonable damages for the lost use of flooded property.

Settlers and businesses zealously guarded the streams, lakes and rivers that moved goods to market. To ensure the paths of commerce flowed freely, the Territorial Laws of 1841 forbade all dams, bridges or other obstructions in navigable waters unless expressly permitted by the legislature. Between 1836-1910, the legislature granted 665 dam franchises to create power, improve navigation, facilitate log driving and lumber processing, encourage fish farming, create canals, fill ponds, flow cranberries, build levees and form millponds. Towns and counties would receive authority to construct public dams, bridges and roads over waters in 1858. The same law set fines up to $5 for dumping logging wastes like wood slabs, brush and debris in streams.

In 1911, the Dells Dam failed, rising water downstream then collapsed the Hatfield Dam and wiped out most of the business district of Black River Falls. It was clear the legislature had neither the time nor the expertise to oversee how dams were constructed and maintained. They gave the Railroad Commission (now called the Public Service Commission) the sole jurisdiction to issue and oversee permits for dam construction. The program would subsequently be entrusted to the Department of Natural Resources.

Industries and business opportunities promising jobs in the cutover stumplands of northern Wisconsin received special attention. The Cranberry Law of 1867 granted special privileges to dam, ditch and cultivate this crop that might help the depressed region recover. One project stretched these special water rights to great lengths, ditching more than 10 miles of Wood County to connect the Wisconsin River to the Cranmoor marshlands.



RICHARD J. KNITTER

Bird's-eye view of a cranberry bog. Cranberry growers were granted special privileges to dam and ditch waterways in 1867. Growers and environmentalists are currently debating what additional protection wetland acres need.

Interpretations broaden to protect public water rights

An 1870 case *(Yates v. City of Milwaukee)* restricted how far shoreland owners could place wharves and

MICHAEL WEIMER

(top) The Dell's Mill at Augusta was typical of the hundreds of small millponds authorized by the Legislature between the 1830s and 1910. Impoundments of public waters were permitted to harness energy for grist mills, saw mills and mechanical power.

(bottom) Illegal boat house. Case law interpreting the Public Trust Doctrine answered such knotty questions as how far riparian landowners could build into public waters.

RICHARD J. KNITTER

piers into navigable waters. These riparians (from the latin *riparius*, "belonging to the riverbank") could build out from shore just far enough to have deep access to float a boat as long as such structures didn't interfere with public navigation. Wisconsin law maintains very tight reins in restricting structures extending from shore. An 1877 case set limits on shoreline construction to keep the water from wearing away the banks.

Another landmark case *(Olson v. Merrill)* in 1877 shored up the public's right to perpetual use on waters that may only be navigable for a short period of time each year.

Other actions wrestled to define where the shoreland owner's property rights end and public water rights began. Landowners own the property as far as the highest point the water normally reaches, the ordinary high-water mark. Landowners also have exclusive rights to use lands between the ordinary high-water mark and the low-water mark, but this region must remain open to public navigation.

Legal cases also settled who owns the riverbed under streams, beds and flowages created from streams and lakes. All natural lake beds are publicly-owned. Streambeds, on the other hand, are owned by the shoreland owner up to the middle of the stream. Although the public had rights to travel streams and cross ice, the ice that formed in winter was exclusive property of the person owning the water bed — an important property right in the days when ice houses preceded refrigeration.

JIM ESCALANTE

Shoreland owners can build piers to float a boat but they can't fill in wetlands to reach the pier.

Water rights secured around the turn of the century kept wealthy land barons from turning public waters into private sanctuaries. *The Willow River Club v. John Wade*, 1898, established the public's right to fish on navigable waters surrounded by private property. *Diana Shooting Club v. Husting*, 1913, set similar rights to hunt the wetland waters near Horicon Marsh. The courts subsequently upheld public rights to boating, sailing, skating, swimming and other recreational pursuits, even just enjoying the scenery. Wisconsin law expressly allows recreational rights to surface waters for "any purpose whatsoever" as long as the water is maintained for equal enjoyment by others.

The Water Power Acts of 1911, 1913 and 1915 set the framework for reviewing proposed projects to dam, ditch and drain waters; construct bridges; dredge sand, gravel and marl (clay sediments used to lime farm fields); and build docks and piers from shore. A dam inventory program starting in 1914 assessed who was operating dams and how public waters were used for public and private gain.

Water law between 1920-1930 refined these acts and set standards for determining benchmarks (flow rates, high and low water levels) on hydroelectric projects. Widespread development of electric power for public works and home use meant that communities distant from the water's shore could share in its harnessed power.

In the 1930s, dams were recognized as equally useful tools for slowing down raging gully-washers in western Wisconsin or for slowly rais-

RICHARD J. KNITTER

A 1966 case reaffirmed the State of Wisconsin's responsibility to hold the beds of navigable waters in trust for all citizens. The trust doctrine does not prevent minor alterations of natural boundaries between land and water. However, the court ruled that an extension from this property on Plum Lake *(Hixon v. Public Service Commission)* was not a minor fill. The decision stated "Our navigable waters are a precious heritage; once gone, they disappear forever."

RICHARD J. KNITTER

RICHARD J. KNITTER

(top) Sierra Club members canoed Five Mile Creek near Bayfield to prove it was a navigable water protected for public use.

(left) Development pressures along waterways are tremendous. Bit by bit rezoning battles in Milwaukee let builders and businesses encroach on the riverbanks until a channel remained.

ing wetland flowages that attract wildlife.

Recreational uses and individual rights

A proposed dam on the Namekagon River of northwestern Wisconsin sparked a raging battle in 1950 between power interests and hunters, anglers and canoeists who savored the river's wild character. This conservation charge, lead by attorney Virgil Muench representing the Izaak Walton League, successfully fought the dam. The case determined that preserving the river in its natural state was more valuable to the public interest than producing electricity. Even though the project would have been a commercial success, the courts deemed natural preservation as a legitimate reason to conserve the river. The Wild Rivers Act of 1965 forbade construction or development on national scenic rivers. The first river protected under this nationwide program was the Namekagon.

The Wisconsin Water Resources Act of 1965 gave local governments responsibility for maintaining the public trust on shoreland development. These programs set zoning standards on lands designed to protect the water and prevent construction in inappropriate places. A 1968 case *(Just v. Marinette County)* extended public trust protection to wetlands and other areas adjoining waterways.

We are still filtering water questions through the fabric of this two-century-old policy. Today, we pose more questions about protecting water and shoreland resources than developing hydropower or encouraging commerce on waterways. In the 1990s, most of the shorelands that can be easily developed have been. Construction techniques could produce large buildings jutting out from small pieces of property. Better technology could fill in areas previously abandoned as infeasible building lots. These properties are available for a tiny fraction of the cost of upland property. Urban revival makes aging waterfront manufacturing centers a builder's bargain. Marinas, parks, waste disposal practices, new types of watercraft all pose questions about our collective rights to use and enjoy water. How are courts interpreting these modern water questions? You'll find out in our next issue. Trust us. □

David L. Sperling edits Wisconsin Natural Resources magazine.

Readers Write

DECEMBER'S DELIGHTS

Once again you have outdone yourselves! The December 1990 issue was a real treat — I couldn't get enough! I wish Wisconsin Natural Resources came out every month.

"Lone wolf odyssey" and "Small Packages" were my favorites. Maybe you could do something on year-round tree identification. You'd be amazed how complex, precious and just plain amazing trees are. The nice thing about tree identification is that you can do it anywhere, anyplace, anytime (as long as there are trees around!).

Keep up the good work. You haven't let me down yet!

Barbara Neff
Green Bay, Wis.

Thanks for the December 1990 issue. It's amazing how your magazine keeps improving in subject matter and style. The December issue is the best yet — a real bonanza!

We particularly enjoyed "Where Earth Day dawned every day," the story about the year-long curriculum emphasis on environmental themes in Door County's Gibraltar Area school system. It inspires our hope for the future.

We like the way you summarized the year-long "Earth Notes" feature. The little copyright block at the end leads us to believe the whole series of six might be available . . . please advise us of the cost and let us know how to order the "Earth Notes" collection. We'd like several sets to distribute to activist friends.

We were also pleased to learn about The Raptor Center's professional, effective staff in "A second chance." Although this clinic for our feathered friends is associated with the University of Minnesota and located in St. Paul, it's good to know that Wisconsin's raptors are welcome there as well! We were somewhat disappointed that no mention was made, nor credit given, for the very important pioneering work on the rearing of peregrine falcons in captivity and the successful return of fledglings to the wild done by the Cornell University Laboratory of Ornithology.

Keep the good news rolling!

Jack and Barbara Rudolph
Appleton, Wis.

To obtain a six-issue set of "Earth Notes," send a large, self-addressed envelope with .98¢ postage to DNR Bureau of Information and Education, Publications, Box 7921, Madison, WI 53707.

INSPIRED BY FROST

My wife and I find your magazine an excellent one, each issue crammed full of interesting things. If you didn't print the articles you do, fewer people would realize the many things that go on in Wisconsin and in other states and countries.

Both of us look forward to each issue and read it cover to cover. I liked the piece "Frosty flights of fancy," for though everyone seems to know what frost looks like, few know how it forms. I never knew until I read Anita Carpenter's story. Thanks, Anita, for a job well done.

Before we put storm windows on our home I had my own ideas of what "frost paintings" looked like and wrote a poem about them in free verse:

Frosted Windowpanes

Magic!
Between midnight and
morning,
windowpanes decorated
with delicate strokes
of small brushes used by
Jack Frost and fairies
who go about painting
designs
very beautiful to behold.

There were shapes of
snowflakes,
some as fine as feathers,
others like pipe cleaners,
only more lovely,
looking as if they were
covered
with tinsel of Christmastime.

Spiderweb strands
of frosty covered threads,
some like a burst of
fireworks
on the Fourth of July.
Shapes like vines entwined.

Tangled roots
growing in every direction,
Shooting stars, flowers,
lace on valentines,
a starfish, somewhat
relaxed.

The sun shone upon them
and they were more
beautiful
than ever.

Kenneth P. Van De Bogert,
age 76
Delavan, Wis.

ISLAND HUNT

I'm interested in finding out about the special black-powder deer hunting season on the Apostle Islands, which was mentioned in the August 1990 issue of your magazine.

Ed Czajkowski
Racine, Wis.

John Krambrink, the Apostle Islands National Lakeshore's chief of resource management, tells us that hunters participating in the 1991 muzzle-loading deer season on Oak and Basswood islands should plan for a challenging hunt in a pristine, backcountry setting. It's no target shoot: Populations range from a mere five to 10 deer on each island, and in the six years that the hunt has been held, only four deer have been taken. The experience, not the 10-point rack, is clearly what you're after here. For an application, write the Apostle Islands National Lakeshore, Route 1, Box 4, Bayfield, WI 54818 or call (715) 779-3397. Applications must be postmarked no later than August 31, 1991.

CREDIT WHERE CREDIT IS DUE?

Referring to the bottom-right picture caption on page 11 of "Earth Notes" in the December 1990 issue: What are "emission credits?" The caption states that emission credits can be sold to other companies. My interpretation of the caption is that the Spic and Span Company of Milwaukee, by installing efficient dry cleaning equipment and reducing its solvent emis-

sions, can in turn can sell its "rights" to pollute to other companies, for money?
Kathy Kruger
Lake City, Minn.

You're right, though it seems wrong to allow companies to profit from polluting. Call it a means to an end — which is, of course, clean air.

All industries and companies emitting pollutants receive an operating permit from the Department of Natural Resources indicating the quantity of sulfur dioxide, volatile organic compounds, carbon monoxide and other contaminants they can release into the air. Emission standards are set by the state and federal government.

If Company X is permitted to emit five tons of sulfur dioxide each year but, thanks to more efficient equipment or better manufacturing methods, only emits three, it can sell or barter a portion of the "unused" two tons to another company.

Notice the word portion: Trading in emission credits is not a one-for-one deal. An industry that wants to buy emission credits from Company X may only purchase the rights to, say, 1.5 tons of emissions. The result is that both companies are polluting less.

The market sets the price per ton of emission, but DNR sets the percentage that can be sold or bartered. In Milwaukee, a ton of emissions ranges anywhere from $2,000 to $5,000. Companies do profit from selling emission credits, but it's a one-time windfall, after which they are committed to a lower level of pollution. As fewer credits become available, the increased expense of purchasing "pollution rights" will encourage new companies to be as non-polluting as possible.

The practice of selling or bartering emission credits developed when certain parts of the country — particularly large urban industrialized areas like Milwaukee — were unable to meet air quality standards set by the United States Environmental Protection Agency. Under provisions of the Clean Air Act, construction of new industries or the expansion of existing companies would not be allowed in these "non-attainment" areas.

But the idea was to promote clean air, not thwart economic growth. The marketplace responded by selling emission credits, allowing businesses to open or expand while pollution levels drop. It's not the most perfect system, but air quality regulations are difficult and costly to enforce, and if industry wants to join in what is essentially a self-regulating activity, that's fine with us. Smart companies know preventing pollution right from the start makes the most economic sense of all.

NEXT ISSUE:
Dragonflies
Lake Michigan shoreline stroll
The water spa and bottled water business in Wisconsin

DAVID CREHORE

House finch *(left)* and the orange variant *(right)* photographed this winter at a feeder in Manitowoc.

Continued from page 2

common in the western U.S. and this variant also has been observed in some eastern states. Females of both species are brown and may be confused with sparrows. The female house finch has a more finely streaked breast than the purple finch and lacks the purple finch's distinctive pale streak over the eye.

The original range of the house finch extended from Texas to California. In the early 1940s the birds were captured and shipped to the East Coast for use as cage birds. Owners in New York City and environs released their "Hollywood finches" and the escapees established the eastern population that has now colonized Wisconsin.

House finches were first sighted in Wisconsin in the mid-1980s. Temple and Cary's 1987 book, *Wisconsin Birds: A Seasonal and Geographic Guide*, lists the house finch as a rare species with records from only five counties. By December 1989, bird watchers participating in the Audubon Christmas Bird Count sighted 339 house finches in the Madison area alone! Recent observations of the house finch span the width of Wisconsin and extend north to a line from Eau Claire to Green Bay with a few scattered sightings in far northern counties.

House finches thrive in a variety of habitats, sometimes to the detriment of native species and agriculture. In rural California, the "Hollywood finch" might well be called the "Hollywood pest" — it frequents orchards and vineyards, causing considerable damage to grapes and other soft fruits. In urban and suburban areas of New York state, prolific house finches have displaced the native purple finch and may have reduced house sparrow populations. House finches readily take to bird feeders and can overwhelm other species with their sheer numbers.

Enjoy the color and song of this new arrival in Wisconsin, but keep a close watch on the habits of the house finch. If you observe any unusual interactions with other species, or notice any problems caused by the red-headed songsters, please share them with your Extension agent or DNR wildlife manager. □

UW-Extension Wildlife Specialist Scott R. Craven tracks species old and new from his perch on the University of Wisconsin-Madison campus.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