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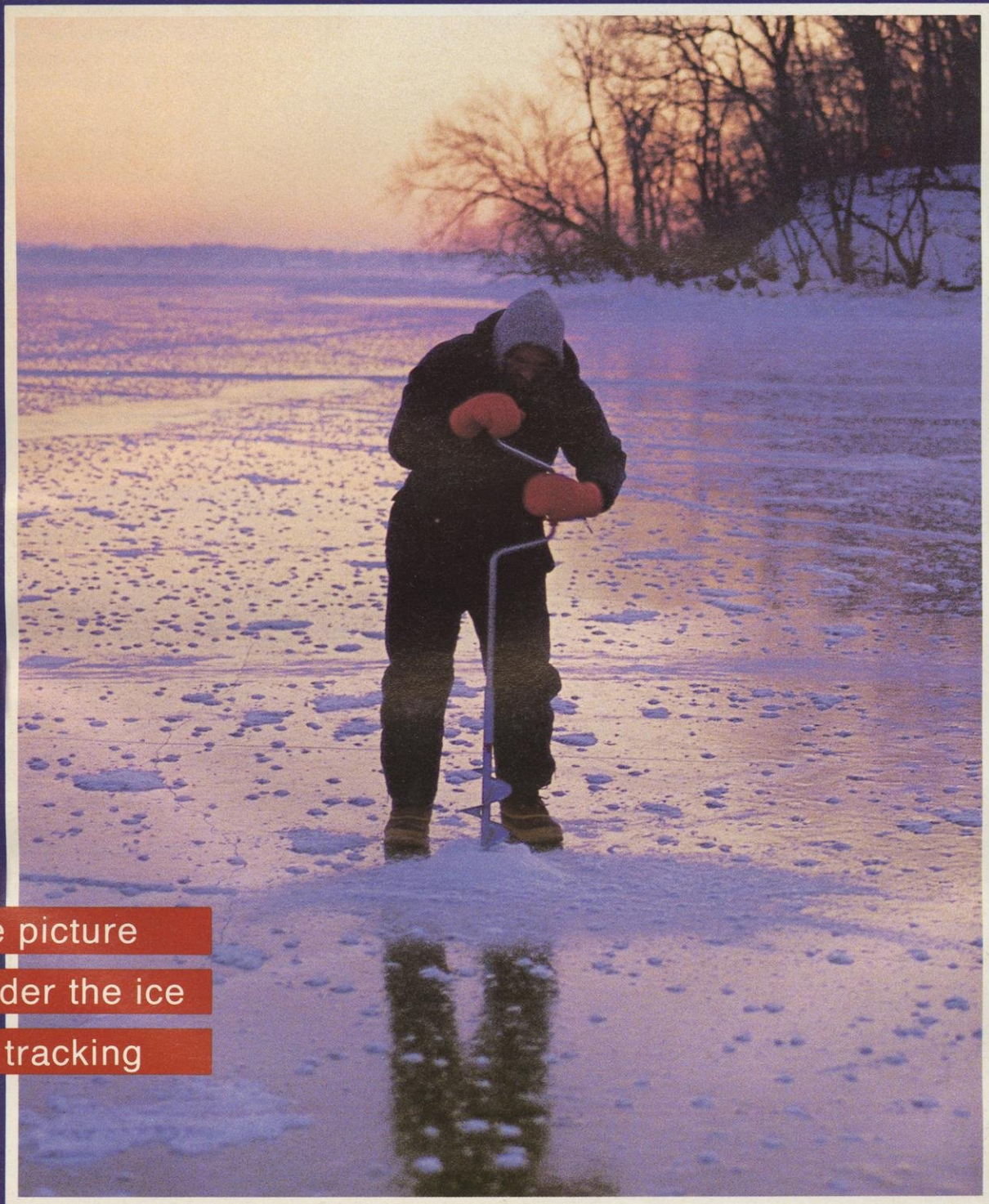
SPECIAL REPORT: In common trust . . .
gains and goals for natural resources

WISCONSIN NATURAL RESOURCES

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January/February 1988

Volume 12, Number 1



Get the picture

Life under the ice

Winter tracking

Project WILD

Kari Esbensen

Developed for children — brings out the kid in all of us.

With the blindfold removed, the “predator” slowly scans the shady under-story of the forest. Cautious not to be seen, it searches for a hint of movement or glint of color — waiting, waiting.

Wary eyes watch nervously from hiding places.



Teachers get a kick out of teaching themselves Project WILD activities. Here, teachers play “animal charades” acting the parts of an adult bird with a brood of chicks. Photo by Bob Wallen



How do teachers make students curious about life in our watery world? Aquatic WILD suggests ways teachers can build an appreciation for aquatic organisms and environments into everyday subjects like reading, science, dramatics, music, language arts, mathematics and social studies. Photo by the author

SNAP — a twig breaks, and the hungry predator lunges.

“I see you!” shouts the predator, and a red shirted youngster emerges from behind a tree.

Now captured, the youngster, once prey, becomes the predator, and the lesson called “The Thicket Game” continues.

“The kids love it,” says Carl Prien, sixth grade teacher at Bonduel Elementary School. “It’s a great culmination of things they learned earlier in the classroom.”

“The Thicket Game” is just one of 150 activities offered by the wildlife and aquatic curriculum education program, Project WILD (Wildlife in Learning Design).

Project WILD uses the intrinsic appeal of wildlife to innovatively teach traditional subjects. The program helps develop awareness, knowledge, skills and commitment to wildlife and the environment. Educators believe the program will lead children to better understand the problems people pose for wildlife and better prepare children to make informed decisions about natural resource matters.

Project WILD was developed by the Western Regional Environmental Education Council and the Western Association of Fish and Wildlife Agencies and is sponsored by DNR and the Department of Public Instruction in Wisconsin.

Since 1985, more than 5,000 Wisconsin teachers, naturalists and other interested educators have attended Project WILD workshops. Many, like Prien, use the K-12 interdisciplinary materials to supplement courses in math, science and language arts.

Project WILD materials are suited for use in the classroom or on school grounds. A round of “How Many Bears Can Live in This Forest?” can quickly have a class of third grade “bears” crawling around the “forest” floor, searching for colored cards representing food, and learning about wildlife concepts like carrying capacity. An hour of “Ethi-reasoning” will have a class of eighth graders intently discussing values and debating controversial questions about captive wildlife, pesticides and hunting.

Complement a Project WILD activity with a field trip to a marsh, prairie or some other natural habitat, and you have an unbeatable learning combination guaranteed to score high marks with kids of all ages.

Kari Esbensen is Assistant State Coordinator for Project WILD.

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FRONT COVER: Another dawn, another
ice angler, another ray of hope for a fresh
fish dinner! Photo by David L. Sperling



Aldo Leopold

Frances Hamerstrom

Aldo Leopold was known by many of his students simply as "The Professor," as though there were no other professors on the University of Wisconsin campus. His office in 1938 was a small, badly lit room in the basement of the old Soils Building. To enter it, one passed through a sort of vestibule used by the campus gardener as a potting shed. The potting shed was also the only "office" of The Professor's six graduate students. We kept a bannister brush hidden under the big table we used for making graphs, preparing specimens and studying, so we could brush away begonia leaves, wet earth and the fragments of flower pots that the gardener left behind.

Leonard Wing, one of the students, refused to work in the potting shed and tried to get the rest of us to keep it picked up so the entrance to The Professor's office would make a good impression. Late one afternoon, Wing, his dark eyes sparkling with suppressed excitement, whispered, "I've found a whole empty building on the campus. We are going to move The Professor. Bring your car at 8:00; it will be dark by then. You tell Hawkins, and I'll tell Wade."

We met at 8:00. Wing said, "I've found two wheelbarrows. Let's get the top of the Hamerstoms' car down right away; the big things go on the car. I'll keep an eye out for the night watchman

But it's already done

Our salute to Aldo Leopold included reflections from his colleagues and writings that first appeared in this magazine's predecessor, the *Wisconsin Conservation Bulletin*. The centenary celebration of his birth spawned several new books which should delight those who want to know more about Leopold.

I thought it would be nice to end with a story; a light reminiscence from one of Leopold's students, Frances Hamerstrom. It describes the day Leopold's students decided "The Professor" needed new digs.

and the campus cops. If you hear the call of a barred owl, it's the signal: watch out. . . . And you, Hawkins, take off that white sweater. It shows a mile away."

I hung the sweater over Leopold's desk lamp so passersby would be less apt to see what we were up to. We packed and moved all the books, all the reprints, all the maps, the duck decoys and the furniture into a roomy empty building that had once been a dwelling. We moved everything and then, to convert the whole ground floor into Leopold's possession and fill the place up, we moved tables and chairs and bookcases from our own quarters and arranged them to "occupy" as many rooms as possible. As a final touch, I picked some flowers from the campus gardens and put them in a mason jar on Leopold's desk.

Exhausted and somewhat grubby, we waited for Leopold's arrival the next morning. The Professor came down the path at a brisk pace. Leonard Wing, whose sense of the dramatic far surpasses mine, announced, "Your office isn't here anymore. Follow me."

Wing led the way to 424 University Farm Place. He threw the front door open and announced, "This room will be for seminars. It has a fireplace for winter

seminars, and it can hold 40 people."

Wing moved to the adjoining room. "Your office!" Sunlight poured in through big bay windows. All the books were in position on shelves that left room for more, and Leopold's pipe rested on the ashtray on his desk.

Wing let Leopold take it all in for a moment or two and then announced, "There's more. This room is for graduate students. It needs more desks."

He moved us on to the former kitchen. "This is the laboratory. It needs painting. We'll do that this afternoon."

Then he led the way to the pantry. "This is the darkroom. We'll paint it black. It has running water, too."

Finally, he opened a door leading to a room almost as big as The Professor's former office. "We could use this for storage, and there is plenty of storage space in the basement too."

Leopold asked, "How did this come about?"

Wing's deep voice answered pompously, "The other office was not suitable for you."

The rest of us explained how we had managed the move with two wheelbarrows and one car "between two days."

Leopold sat on the edge of his chair and telephoned the authorities. We could hear only his end of the conversation. "You say that the building has already been assigned to another department? . . .

"Yes, I understand perfectly. What I'm trying to explain is not that I wish to move my office. It's already *done* . . . !

"No, just the ground floor. The whole ground floor."

At last Leopold settled back in his desk chair, reached for his pipe and lit it slowly. He didn't need to say a word. He was smiling, and so were we. In those days, not everybody knew that Aldo Leopold was a great man, but his students did.

"424 University Farm Place" was the address of Leopold's department for the rest of his life.

And sometimes, when I hear a barred owl call, I remember that night and the dread with which we listened for footsteps, police whistles, and for the warning that never came.

Reprinted with permission from "Strictly for the Chickens" by Frances Hamerstrom, Iowa State University Press, Ames, Iowa 50010, ©1980.



424 University Farm Place, Leopold's office during most of his academic career. The turn-of-the-century victorian house was once Dean Harry L. Russell's home. Photo by Robert Fuller courtesy of Robert McCabe

Wisconsin deer in Dixie

William E. Schultz

When I walked up to the beautiful nine-point, 200-pound whitetail I had just dropped, it was obvious this was no purebred Southern deer.

No, it reminded me of my days hunting the Badger State, and its size confirmed again there are still Wisconsin deer in Dixie.

I was hunting in Jones County, one of the first places Wisconsin deer were stocked in Georgia. My deer's ancestors were brought to the area in 1944, during the very early part of a stocking program that lasted well into the 1960s.

Wisconsin deer are the northern subspecies of whitetail, *Odocoileus virginianus borealis*. Native Georgia deer are the southern subspecies *Odocoileus virginianus virginianus*.

The *borealis* subspecies is the largest variety of whitetail. The world record typical head, which scored 206 5/8 points on the Boone and Crockett scale, was taken near Danbury, WI in 1914.

Many of that big boy's cousins were stocked in Georgia's piedmont, a belt of counties stretching from South Carolina across the state's midsection to Alabama.

There's an excellent food supply and no harsh winter. And it means the trophy potential is really much greater than it would have been had the state been solely stocked with Texas deer or native Georgia deer from the coast.

The old Georgia Game and Fish Commission stocked 439 Wisconsin whitetails into 24 counties, and unknown hundreds more were brought by landowners fascinated by the idea of big bodied Wisconsin deer on their farms.

Private stocking was also done by the Worth County Wildlife Club.

"We didn't have any deer in our section at the time, no deer at all," recalls Heyward Brown, now 82, of Sylvester, past president of the club.

Club members saw an ad in a wildlife magazine offering Wisconsin deer for sale and went after them. "We bought 16 deer to begin with; 10 does and six bucks, from a Mr. Shuwalters (or Schowalter) up in Babcock, WI," Brown says.

Eventually, the club brought back about 100 deer, turning them loose in Worth and northern Colquett counties in southwest Georgia.

"Because we used Wisconsin deer, we have trophy deer," Brown says. "They are larger, I'd say healthier, than others in Georgia.

"My largest buck was probably about 300 pounds. And we've seen the biggest deer, I'd say, that's ever been killed. I think it was 500 and some pounds."

Remnant strains of Wisconsin whitetails may still be beefing up Georgia deer herds.



Simple deer traps like these were baited with alfalfa hay and cranberries. Captured deer were crated and shipped out of state. This trap from January 1964 was found on the Sandhill Wildlife Demonstration Area.

Photo by John Kubisiak

The live weight of that monster, taken by Boyd Jones of Tallahassee, FL in 1972, was never officially recorded, but the animal weighed 355 pounds field dressed. And though the 10-point rack didn't make the record book, that deer stands as the heaviest deer ever taken in Georgia.

"I'm glad we decided to go with Wisconsin deer," Brown says. "We probably could have got some Georgia deer from the islands, but they're small."

The reason Wisconsin bloodlines make Georgia so outstanding for deer hunting has to do with what biologists call Bergmann's Rule. It says that animals of the same species living in colder climates tend to have larger bodies than their cousins in warmer climates. That's because larger bodies retain heat better in the winter.

The larger animals from Wisconsin have played a major role in putting the

Peach State well up on the Boone and Crockett Club list of record bucks. Minnesota leads the list, followed by Wisconsin, with its 73 typical and 52 nontypical bucks, according to a recent summation of records published by Boone and Crockett. Georgia leads the south with 24 typical and six nontypical bucks.

Georgia hunter and author Duncan Dobie, who wrote "Georgia's Greatest Whitetails," said his research indicates there probably are 50 deer in Georgia that qualify for the record book.

Among other Southern states: Kentucky has 16 typical deer on the Boone and Crockett list, Louisiana 15 and Mississippi 11.

Dobie said experts from the University of Georgia did computer studies which showed the hybrid Wisconsin-Georgia deer produced the biggest racks and the biggest bodied animals. These were in the piedmont counties — west and southwest Georgia — where a lot of the biggest deer come from. The Texas deer didn't fare too well in their studies.

Those piedmont counties are among the most heavily hunted in the state. Bucks have little chance of making it past age five and so they rarely reach truly huge proportions. But each year new record class animals are taken.

Georgia got into the deer restocking business because deer were virtually extirpated in the state by 1900.

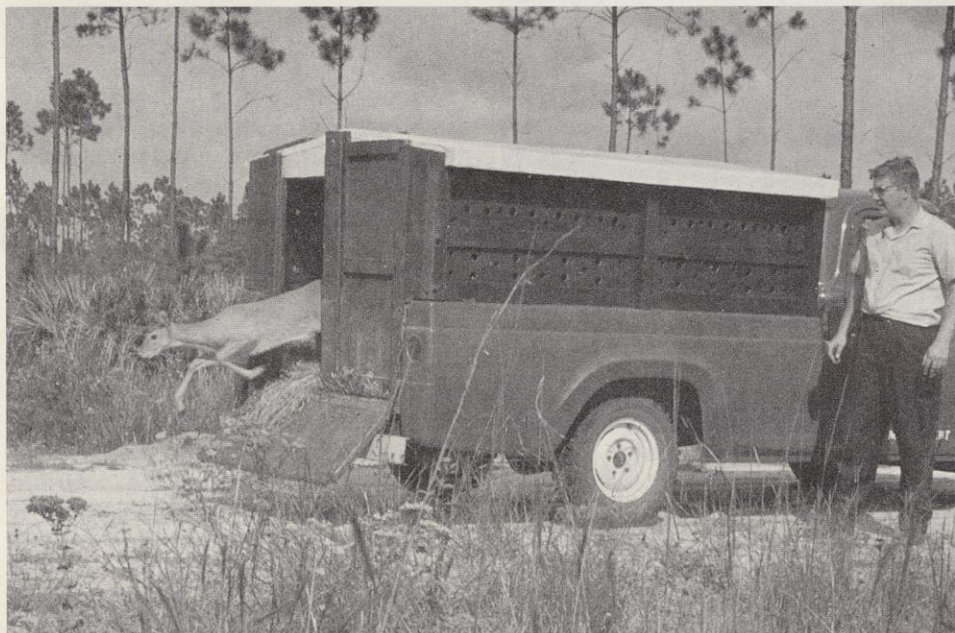
The first stocking efforts brought deer from North Carolina to the Georgia mountains by 1940. There are reports that deer were brought in from Minnesota, Michigan and Montana to stock mountain counties, but biologists have never confirmed them.

The major restocking effort didn't get under way until after World War II. By the time the program ended in the 1960s, 1,922 deer had been brought into Georgia: 1,058 from Texas; 439 from Wisconsin and fewer numbers from Kentucky Maryland, North Carolina and Virginia.

Dart gun helped livetrapped deer

An offshoot of the program was development of the "Cap-chur" gun to catch deer without injuring them. It's the dart gun now seen on almost every television wildlife show.

It was the idea of Jack Crockford, a Michigan born game biologist who became director of the Game and Fish Division. An expert gunsmith, Crockford devised the device while Dr. Frank Hayes of the University of Georgia School of



Top: Workers calibrate doses of modern compounds used to anesthetize animals so they can be safely handled. The compounds contain an immobilizer and a tranquilizer. Photo by Jeff Wilson

Middle: Captured deer were transported and released in Georgia to beef up local breeding stocks. Photo courtesy of the Georgia Department of Natural Resources

Right: Dr. Sheldon Feurt, University of Georgia School of Pharmacy, examines a deer hit by a drug-laden dart. Feurt was part of the Georgia team that perfected the Cap-chur tranquilizing dart gun. Photo courtesy of the Georgia Department of Natural Resources



Veterinary Medicine, Dr. Sheldon Feurt of the university's School of Pharmacy, and some dedicated graduate students developed the dart and the drug dosage.

After testing 165 drugs, they settled on nicotine, a dose equivalent to about two packs of cigarettes, as the best to capture deer.

Better chow builds bigger deer?

Crockford himself says he didn't go along with the idea of developing a "large deer" herd in Georgia by using Wisconsin deer. He said Georgia bought Wisconsin deer because there was a steady, dependable supply of the animals available there.

Crockford retired in 1978 and now, as the elder statesman of game management in Georgia, doubts the theory Wisconsin deer are the reason for huge Georgia deer.

He cites key factors including: the superior nutrition available in parts of the state, a deer's ability to make it to age six in some areas, along with genetics, which produce big bodies and record book antlers. Small deer captured on Georgia's overcrowded coastal islands have bred descendants that grew past the 200-pound mark, Crockford said.

Bigness is in their genes

Some sportsmen don't agree.

"The Wisconsin deer are the reason we got three nine-point, 200-pound deer off our lease," said Bob Fawcett, a Jones County hunter. "You can still see the mark of the hybrid on some of them. They have a large white throat patch with a brown band across the middle."

One of the two yearling bucks in camp had exactly such a throat patch. Other deer among the 10 taken by the 10 hunters in our group had a throat patch which extended only a couple of inches down from the jaw.

The hunters who believe Georgia's excellent deer hunting has its roots in the Badger State point to Dobie's research.

Of the 41 deer listed as Georgia's greatest whitetails, all but five come from counties where Wisconsin deer were known to have been stocked, two from counties immediately adjacent to them. Those hunters are awfully glad there are Wisconsin deer in Dixie.

William E. Schultz writes for the Associated Press in Atlanta, Georgia.



Red-breasted nuthatch in midflight. Wildlife photography will reward patient, prepared photographers. Photo by Lynn Rogers

Get the picture

Dave Crehore

Tips to help wildlife watchers take better photos.

The first thing you'll need to take good pictures of wildlife is a 35 millimeter (mm) single lens reflex (SLR) camera, the kind that accepts interchangeable lenses.

You must also have a long focal length lens, usually known as a "telephoto." Telephoto lenses "see" a narrow angle of view and appear to magnify the image, making birds or other animals seem closer to the camera than they really are.

How much telephoto do you need? In most situations it takes a lot of magnification to produce a worthwhile picture of an animal. Even with a 300mm focal length lens, which produces about six-power magnification, you'll have to be

within 50 feet of a small critter to get a recognizable picture of it.

So here's the first rule of thumb for wildlife photography:

1. Use the "longest" lens you can afford and carry — for most work, a minimum of 300mm.

Lens types

There are two kinds of long lens designs: refracting and reflecting.

A refracting lens gets its narrow field of view and magnifying power by locating the glass lens elements far apart, as in a telescope. A 400mm (eight-power) lens will be about 13 inches long, for instance, and could weigh about three pounds. Refracting lenses are bulky, but they can produce sharp images and good color

quality. They also have variable apertures which allow you to control depth of focus and adapt to varying light conditions.

Reflecting lenses, also called "mirror lenses," use internal mirrors to bounce the light back and forth within them. Mirror lenses are lighter and shorter than refracting lenses of the same focal length range; a 500mm mirror lens, for example, is only six inches long and weighs a pound and a half. Mirror lenses are usually less expensive than refracting lenses of the same focal length, and they also focus closer than most refractors.

But there are drawbacks. Mirror lenses are somewhat more fragile than refracting lenses, their images are generally not as sharp, they do not transmit as

much light as refracting lenses of the same focal length, and they have a fixed aperture. This last drawback means that mirror lenses can't be used in extremely bright light without accessory filters.

Experiment with both types of lenses in the camera store before you buy. If light weight is important to you, consider a mirror lens. If the best possible picture quality is your goal, get a refracting lens.

Teleconverters

Teleconverters, also known as "doubblers" or "extenders," are small optical devices that increase the magnifying power of a long lens. A "2X" converter will turn a 300mm lens into a 600, for example. It's a lot less expensive to buy a converter than a second long lens, and that's the principal advantage.

But there are some disadvantages. For one thing, converters can make photography difficult when the existing light is low. A lens with a 2X converter on it will transmit only 1/4 as much light as it would without the converter. A second disadvantage is that you will lose some picture quality — the cheaper the converter, the more you will lose. Finally, there are no bargains. You can buy converters for less than \$100, but you probably won't be happy with the results. The best bet is to buy both a long lens and a teleconverter made by one of the major manufacturers: Canon, Nikon, Minolta, Olympus, and so on. These converters will cost anywhere from \$125 to \$350, but they will produce satisfactory pictures.

Camera types

It's best to start with a 35mm SLR camera, but some are not suitable for wildlife photography with long lenses.

First, rule out the auto-everything, "decision free," program-only cameras that do not permit you to set the exposure manually when necessary. When the lighting is tricky, you can make better exposure decisions than the camera's built-in electronics, so you need a camera that lets you get involved. Also, skip the cameras that only work with autofocus lenses. You can buy autofocus lenses up to 600mm, but they are hideously expensive, and you'll probably have to override the autofocus half the time anyway. Save some money and do your own focusing.

The camera body to look for is one that offers full manual exposure control along with various kinds of exposure automation. The manual control will let you compensate for difficult lighting situations, which you'll soon be able to recognize. The rest of the time, you can set the camera on "auto" and let 'er rip.

You won't need an expensive motor

drive for amateur wildlife photography, but a simple autowinder is something to consider. A winder will advance the film and cock the shutter for you at a rate of about two frames per second, and it lets you keep your attention on the subject while you shoot a sequence of shots. There are times, however, when the sound made by the winder will disturb jumpy wildlife, so it's best not to buy a camera with a built-in motor drive or winder that operates all the time. Look for a very quiet winder you can remove or shut off when its noise could be a problem.

Camera supports

For family pictures, scenery and other general shooting, photographers typically use lenses ranging from 28mm wide-angles up to moderate telephotos such as a 135mm. With these relatively short focal lengths, you can get away with "hand holding" the camera and lens. But hand holding big wildlife lenses in the 300 to 600mm wildlife category is not so easy.

You will waste a lot of film during your first attempts to hand hold long lenses; you'll get lucky with some shots, but if you project the slides or examine the negatives carefully with a magnifier,



Here, great blue herons (top) and double-crested cormorants strike an attractive pose for the photographer. This scene was captured at Grand Marsh Wildlife Area using a 400mm, f5.6 Novoflex lens. Photo by the author

you'll find that a majority will be fuzzy. It's a fact of photographic life that long lenses require some visible means of support.

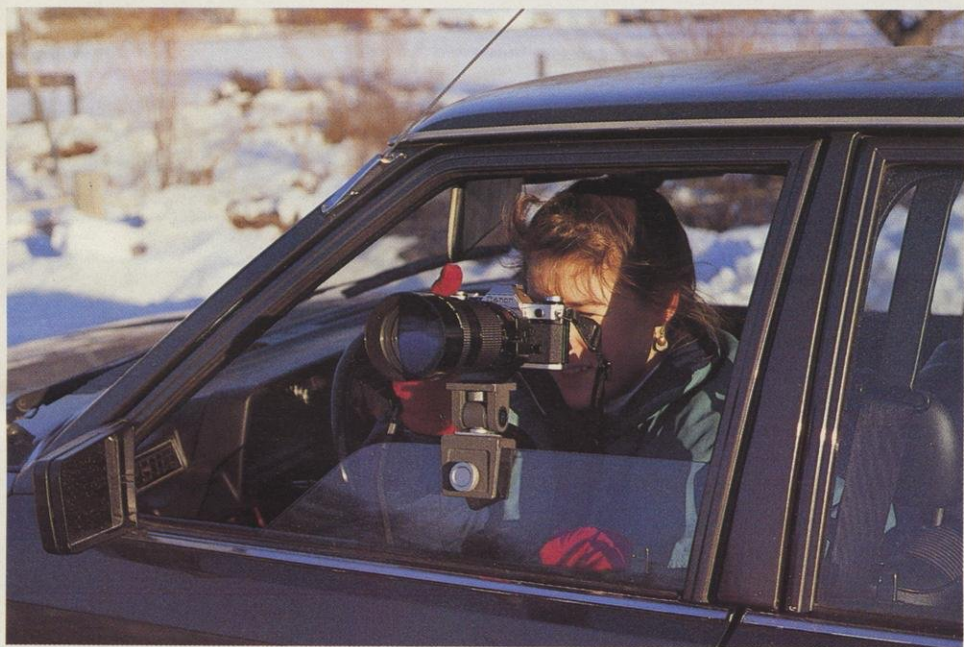
The reason for this is simple: the human body is always in motion. Pick up a cup of coffee and try to hold it steady. You'll never get the surface of the coffee to hold still for more than a second or two. After you stare at the coffee for a while, you'll notice that even your heart-beat makes it jiggle.

Long lenses magnify these human vibrations. Even a slight shake of the camera lens unit during exposure will blur or

soften the image. Reducing the effects of "motion blur" or "camera shake" is one of the major challenges of wildlife photography.

One way to minimize hand-held camera shake is to use fast shutter speeds. The effect of camera/lens movement will be less at 1/1000 of a second than at 1/125, for instance, which leads to a second rule of thumb:

2. If you must "hand-hold" the camera/lens unit, use a shutter speed at least numerically equal to the focal length of the lens and learn to make your body as steady as possible.



Top: Steady support is a must for consistently getting good wildlife photographs. When there isn't time for a tripod, brace your camera with your legs, arms and head. Photo by Don Blegen

Bottom: A window mount can be a great accessory if you're using your car as a blind. Photo by the author

If you're trying to hand-hold a 500mm lens, use a shutter speed of at least 1/500 second to get acceptable results. A 200 mm lens will require 1/250, and so on.

When there is no alternative to hand holding, there are a few other things you can do to get the steadiest possible shot.

- Support your body. Kneel or lean against a tree, car, doorframe or other rigid object.

- Use the fastest shutter possible in the situation.

- Use your hands effectively. Support the lens by cupping it in your left hand. Operate the focusing ring with the thumb and fingers of the left hand. Wrap your right hand around the right side of the camera body, so that your index finger can press the shutter release and your thumb can operate the film advance. Press the camera firmly against your forehead and rest your elbows against the front of your body.

- Squeeze. Ease off the shot, don't punch the shutter release. Take a shallow breath, hold it and then release the shutter as gently as possible.

No matter how well you learn to hand-hold a long lens, however, wildlife pictures taken with the camera on a tripod will always be sharper than hand-held photos, even if they're taken at 1/1000. It's unavoidable, and that brings us to the third rule of thumb:

3. Despite rule 2, use a support for the camera and long lens whenever you can.

Here's a look at the principal kinds of camera supports:

A tripod is the best and most reliable camera support, and the bigger the tripod, the better. If a tripod is really convenient to carry around, it's probably too flexible and shaky to support a camera and long lens. A worthwhile tripod will weigh as much as 10 pounds, will be a pain to carry around — and will be worth its weight in sharp pictures.

Here are four tripod hints: First, make sure the long lens you buy has a tripod screw mount built into it. Always attach the lens, not the camera body, to the tripod. Second, be certain that the locking controls on the tripod head are strong enough to hold a camera and long lens in various positions. Try before you buy. Third, the tripod you use with a long lens should weigh at least as much as the camera/lens unit you are going to support with it. Finally, avoid a tripod with folding horizontal braces between its legs. The braces make the tripod more rigid, but also make it difficult to use on uneven ground outdoors. A day in the field with one of these braced tripods will age you 10 years.

Unipods are overlooked, but useful. A unipod is a collapsible metal post with a mounting screw on top. It's used as an assist to hand-holding while you stand or kneel and grip the camera.

A window mount combines a flat rubber screw clamp with a simplified tripod head. You roll your car window down about three-fourths of the way and clamp the mount on the glass. It's almost as steady as a tripod, and is really convenient when you are using your car as a blind.

Shoulder stocks or "chest pods" are another way to use long lenses without a tripod. The camera and lens attach to the stock, which is then pressed back against the body. In my experience, shoulder stocks are somewhat steadier than simple hand-holding, but are not as steady as a unipod.

Finally, beanbags and miscellaneous other camera holding devices can be useful if you don't have a tripod handy. A cloth bag full of dried beans to rest your lens on will absorb the tremors of your hands. Photo magazines carry ads for a variety of other gadgets that you can use to steady a camera. One of the best is a Vise Grip-type locking pliers with a tripod screw welded to it. You can clamp the pliers to small branches, railings, bumpers and so on.

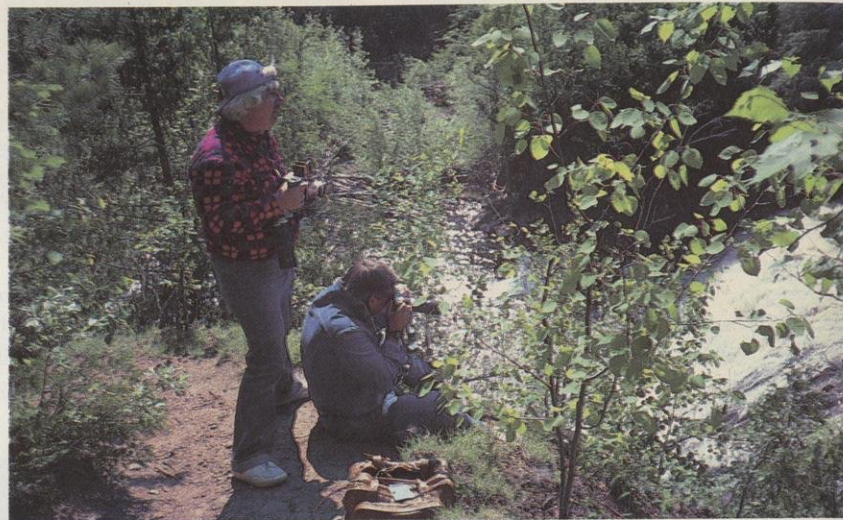
Film

There are two common types of color film that can be used for wildlife photography: color negative and color transparency.

Color negative films produce negatives which are made directly into color prints. The names of these films almost always end with "color," as in Kodacolor or Fujicolor.

Transparency films are used to make slides, and their names usually end with "chrome." Agfachrome or Kodachrome are examples. The slides can be projected or used as color originals for reproduction in magazines such as this one. You can also have a color print made from a slide, although it is expensive. Because professional wildlife photographers shoot for magazines, picture agencies and slide shows, they use color slide film most of the time.

The relative sensitivity of films to light is measured on a scale of "ISO" numbers. The more sensitive a film, the higher its number. For example, an ISO 50 film will be twice as sensitive as an ISO 25 film, an ISO 100 film will be three times as sensitive as a 25 film and so on. Photographers use the terms "fast" and "slow" to describe films — the more light sensitive a film, the "faster" it is.



Left: Wildlife photography is a fun hobby you can share. Good spots and good shots bring back memories of good times. Photo courtesy of the Wisconsin Division of Tourism

Bottom: Tundra swans enjoy a temporary pond at Arlington Prairie. The scene was photographed using a 600mm f8 Novoflex lens. Photo by the author

Film speed is important because long lenses are inherently "slower" than short lenses — they transmit much less light to the film because of their physical length. Under the same conditions, a wildlife lens such as a typical 400mm will require an exposure four times longer than the 50mm normal lens that comes with the camera.

Given this difficulty, wildlife photographers use the fastest films they can, because fast films permit fast shutter

speeds. Suppose, for example, that you are trying to photograph an animal with a 400mm f5.6 lens, the sun is at your back, and the scene is brightly illuminated. With an ISO 25 film, the fastest shutter speed you could use would be 1/250 — fine if the camera is on a tripod, but insufficient for hand-holding. And if the animal were to move into the shade, you would be forced to shoot at 1/125 or even 1/60, risking motion blur that would ruin the picture.

With ISO 50 to 64 films, the fastest possible shutter speed under bright sunlight would be 1/500, enough to permit marginal hand-holding of a 400 and give you quite steady results with a unipod. Films in this medium speed range yield almost as much picture quality as ISO 25 film, and are preferred by wildlife photographers when there is plenty of light.

An ISO 200 film offers even more possibilities, allowing shutter speeds up to 1/1000 in bright sunlight and adequate shutter speeds in lower light. Unfortunately, there is a drawback to fast films: the more light sensitive they are, the poorer their overall picture quality. As a practical matter, most pro wildlife photographers carry 64, 200 and 400 speed films, using 64 and a tripod whenever possible. As you gain experience in wildlife photography, you'll discover the true value of a tripod — it allows you to use slower shutter speeds and sharper films.

Fieldwork

Here is another rule of thumb:

4. Even if you have a long lens, there is no substitute for getting close. Impressive pictures that show every feather won't happen unless you learn to approach animals closely.

Entire books have been written on the use of blinds, calls and other tricks to reduce the distance between the wildlife photographer and his subject, and there isn't space here to do justice to the demanding blend of technology and woodcraft that is required. Read the books, acquire or build some of the equipment, and practice.

The most important field technique, however, is mental, not physical. It's more of an attitude than a skill. Before you can accomplish much as a wildlife photographer, you must first learn to slow down and fit in. As Isak Dinesen wrote in *Out of Africa*:

"Out in the wilds I had learned to beware of abrupt movements. The creatures with which you are dealing there are shy and watchful, they have a talent for evading you when you least expect it. No domestic animal can be as still as a wild





You can get shots like this from a blind. Greater prairie-chicken cocks flutter-jump in competition for hens, Buena Vista Marsh, 600mm f8 Novoflex. Photo by the author

animal. The civilized people have lost the aptitude of stillness, and must take lessons in silence from the wild before they are accepted by it. The art of moving gently, without suddenness, is the first to be studied by the hunter, and more so by the hunter with the camera. Hunters cannot have their own way, they must fall in with the wind, and the colors and smells of the landscape, and they must make the tempo of the ensemble their own."

The animals you wish to photograph are leading lives of their own and can neither obey nor cooperate. Relax, "fall in with the wind," and don't expect too much too soon. Empathize with the animals and develop some hunting instincts. That's the essence of the fifth rule of thumb:

5. Good wildlife photography is primarily a product of the photographer's understanding of wildlife:

Even if you know some photography and have the basic camera equipment, you won't get close enough to record good images if you don't understand the animals. You must create opportunities for encounters with wildlife, and that's where knowledge of and sympathy for the beasts is required. Once you have created an opportunity, you can go about the mechanical task of taking pictures.

Three warnings

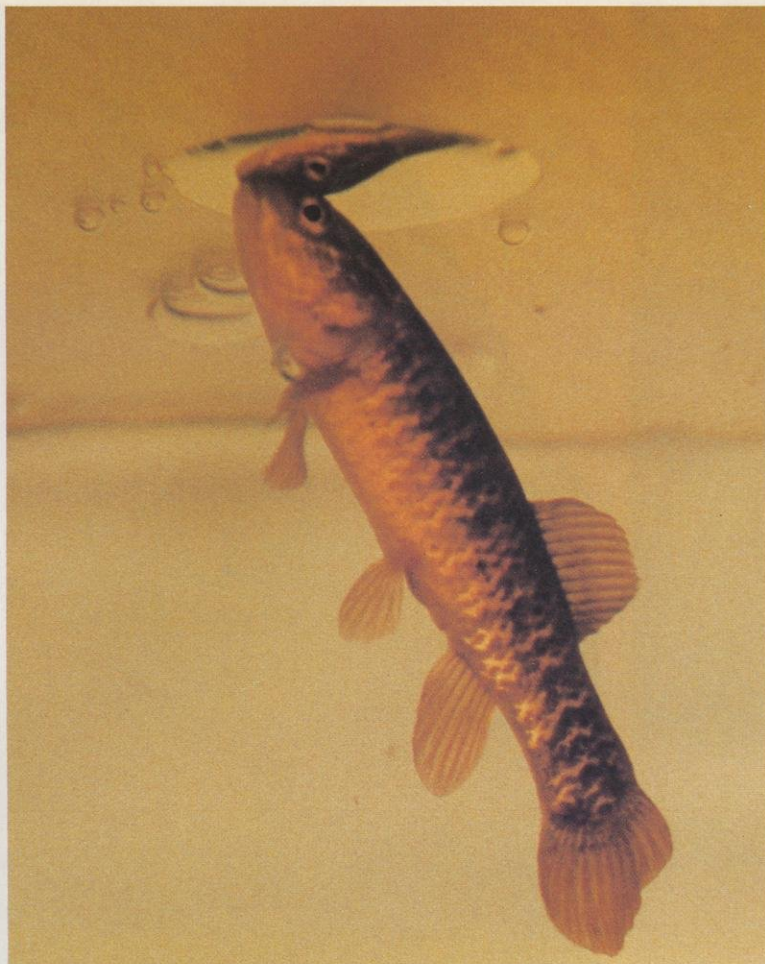
First, as you stalk the wild chickadee with your camera, remember that you are merely an observer and a guest. In your zeal to get the perfect photograph, don't harm your quarry. Nesting loons, for example, make wonderful photo subjects. But if you approach a loon nest too closely, the adult will leave. While it's gone, predators or the weather may destroy the eggs. And loons have enough problems already.

Second, wildlife photography is both expensive and addictive. A full working kit of professional cameras and lenses will run into the thousands before you figure in the travel, film and processing. But it is possible to do good work on a budget with amateur gear. Technique and understanding can take the place of a lot of equipment.

Finally, be aware that wildlife photography is likely to be good for you. Of course, anything that gets you outdoors is good for you. But wildlife photography also teaches patience, sympathy with nature, and humility in its presence. We can all stand a double dose of those.

Dave Crehore is DNR's public information officer in the Lake Michigan District. He's an avid wildlife photographer.

The plucky mudminnow can survive in winterkill lakes. It sucks the air out of gas bubbles that are trapped under the ice. A picture in the laboratory simulating this natural event was photographed by John J. Magnuson and Donald E. Chandler.



Life under the ice

"I'm champing at the bit right now," Dave Johnson said. "I love ice fishing. I think I like it more than summer fishing."

Johnson, who eagerly anticipates his 39th season on the ice, speaks about the sport with a passion that only Leo Buscaglia or Phil Donahue can fully appreciate. Johnson lives and loves to ice fish.

From his customary perch on an up-ended five-gallon bucket, Johnson has looked into the winter world through a 12-inch hole drilled in the ice. The picture looks like a Joe Louis title fight on TV in the '40s, blurry images.

But with the help of avid ice anglers, and experts from the University of Wisconsin (UW) and DNR, life under the ice comes into sharper focus.

John Magnuson, director of UW-Madison's Center for Limnology, discussed the hand dealt to fish by Wisconsin winters. He spoke about the topic on a misty, gray December day from his comfortable office overlooking Lake Mendota on the UW campus.

Magnuson explained two factors in the mechanics of freezing that are critical for life forms. The first happens prior to ice-on. According to Magnuson, the

Fish adjust to survive the big chill of winter. But, under a blanket of ice, the watery world is more moderate than you might think.

Thomas Vanden Brook

lower its temperature, the better water holds dissolved oxygen that will sustain life through the winter.

Second, and perhaps more important: bodies of water freeze from top to bottom, rather than vice versa. And while it doesn't take a degree in limnology to realize that, it's interesting to note the reason. Water reaches its maximum density around 39°F and sinks to the bottom. Thereafter, cooling makes water more buoyant until it freezes.

And that's where the story begins.

"When ice forms," Magnuson said, "the lake is protected from further tem-

perature changes. It doesn't keep getting colder and colder. In fact, in some cases, the deep water may warm up from biological processes, such as decomposition.

"The lake is sealed off," he continued. "You don't have oxygen being added from the atmosphere or as much light coming in. People often wonder: what do fish do under there, do they shut down, do they hibernate?"

Although fish don't hibernate, one denizen of the deep, catfish in the Mississippi, comes close to it. Larry Claggett, DNR cold-water fisheries specialist, cited a study done by the department several years ago. "Theoretically, everything slows down for a fish," Claggett said. "Those catfish look like they're in a state of suspended animation. Divers can pick them up and play with them for a while."

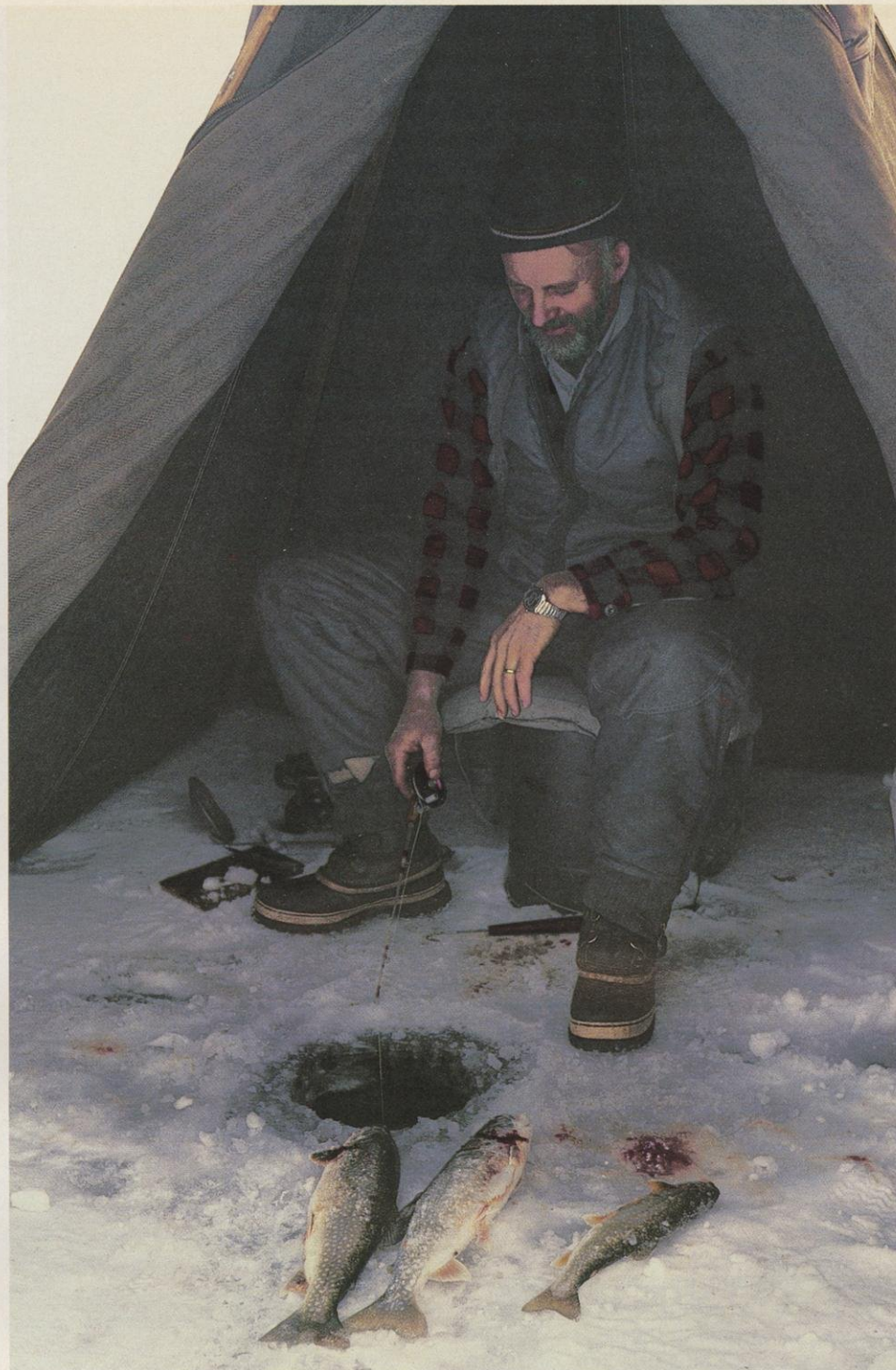
But according to Magnuson, you shouldn't lose sleep over the fate of fish that get left outside all winter. "The first thing you have to remember is that it's a lot warmer under the ice than it is up here. The water temperature is above freezing under there, in some cases close to 40°F, so that's not very cold.

"Animals that live there are in a much



Left: It's a tough sport, but somebody has to do it! This casual ice angler takes time for quiet thoughts on Lake Monona, near Madison, while awaiting a strike. Photo by Anne Short

Right: Splake fishing on Lake Superior. Photo by Rodger Anderson



more moderate thermal environment than those of us that live in a terrestrial realm."

While temperatures are relatively moderate, it's still no Miami Beach in the depths. Fish, being cold-blooded animals, slow down their pace. The rat race lifestyle of summer feeding binges and spring spawning gives way to a more relaxed period. Eating, growth, movement and reproductive patterns all slow down.

John Herbrand, an avid walleye ice angler who took an 11-pound fish from Lake Mendota last year, noted that winter feeding habits for walleye border on

the anorexic.

"During the summer," Herbrand said, "they're feeding twice a day. During the winter, I've heard they'll feed only once every three days."

Further, not all fish were created equal. Some have evolved to be more active in the winter than others. "Ice fishermen are used to catching perch, bluegills and crappies," Magnuson said. "If you have the right bait, you might catch a cisco or bass, but it's not very likely."

Winter also affects eating habits. One source of food available to fish under the ice is a red worm, a larval midge. These



Catching perch requires a keen eye and a quick hand. The winds can howl, the snows can blow, but when perch bite, a rod tip may move but a fraction of an inch. Photo courtesy of the Wisconsin Division of Tourism

worms inhabit mucky lake bottoms in the warmest, most dense water during winter.

"If you're looking for where a fish is going to be," Magnuson said, "consider that it interacts with a lot of things like food and temperature. Fish, particularly perch, forage for red worms, which might explain why ice fishermen often catch perch in deep water."

Reproductive activity also takes a backseat in the frigid water. However, Magnuson said that some fish are armed and ready for the spring spawn. "Those fish are essentially partly ready for spawning in the fall. When a few changes occur under the ice, they move to the spawning beds. One group of fish spawns even before the ice is out. They're just on hold, ready to go as soon as conditions are favorable in the spring.

"Northern pike is a good example," he continued. "Pike spawn in sedge meadows and sloughs around lakes and rivers. They may be spawning in these areas before the ice is actually off the lake. There are some interesting advantages for a predator to get an early start like that. By the time young bluegills are coming off their nests in June, small

northern pike are big enough to prey on these smaller fish.

"Northerns get a temporal jump on the species they forage on later. Walleyes are not far behind."

Dave Johnson, the ice fishing devotee mentioned earlier, agreed with Magnuson. Johnson said that walleyes' fall spawning preparations mean potential trophy fish for the ice angler. "I truthfully believe that the next state record walleye will be caught through the ice. You've got your big females with all their eggs, and they're as big as they'll get."

As winter progresses, respiration and decomposition begin to deplete dissolved oxygen stores. In large lakes, this presents no major problems for fish.

"With regard to oxygen," Magnuson said "in a lake like Mendota — or any of the nutrient-rich lakes in the state for that matter — oxygen begins to disappear from the bottom of the lake first.

"One of the easiest, quickest adaptations that animals can make is to swim up and away from the deeper, low-oxygen area. So, it's a very simple behavioral thing, no different than moving into the shade on a hot day. This may also cause them to move away from the center of the

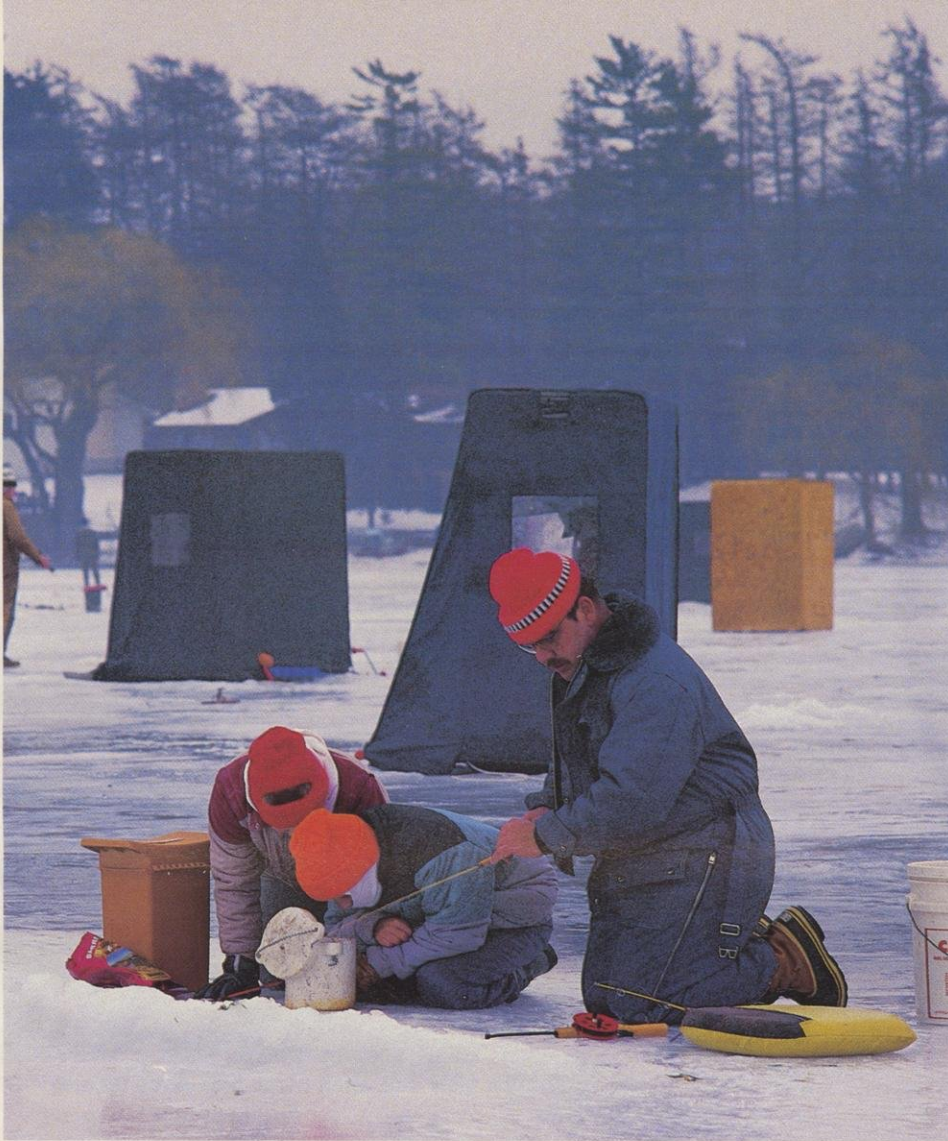
lake, forming a doughnut or ring just above the deoxygenated area."

While fish in larger lakes simply move to more comfortable surroundings, the inhabitants of smaller lakes face another threat, complete oxygen depletion.

"Lakes that are very, very small, shallow and cut off from the atmosphere can be a very severe place to live in the winter," Magnuson said. "There's a fixed amount of oxygen under the ice and that can be used up. We call these 'winterkill' lakes.

"In small northern Wisconsin lakes where this happens, minnow dealers raise baitfish because severe winter conditions kill the fish that you'd associate with game fishing: bass, bluegill, perch and northern pike. Instead, you end up with a group of fish especially able to survive, which turn out to be some minnows and other fishes that we call mudminnows."

Magnuson and his associates found that the mudminnow survives when others can't because of a remarkable adaptation. Mudminnows suck the air out of gas bubbles that form under the ice due to activity from animals such as the muskrat. A small lung allows the fish to breathe the small amounts of oxygen



Like father, like sons. Dad scouts out the fishing hole while the boys talk to the bait.
Photo by David L. Sperling



Ice anglers primarily use minnows and small grubs to catch bluegills in this shallow bay. Photo by David L. Sperling

trapped in the bubbles.

One other creature deserves mention: the crayfish. If the old saw can be applied to a crustacean, winter turns a young crawdad's fancy to thoughts of love. Magnuson noted that unlike pike, the crawdad can't wait for spring to start a romance.

"We've noticed that keeping them under winter conditions in the lab," Magnuson said of the crayfish, "they continue to court and go through all the reproductive behaviors. They do become less active, but they do a lot of courtship in the winter."

Getting back to another smitten by cold and ice, one finds Johnson readying his arsenal for the seasonal offensive. Prints from wildlife artists hang on the walls of his tidy apartment, and his closets bristle with battle-ready ice fishing rigs that he designs and builds. He estimated that his collection of fishing jigs, the small, colorful hooks that sell for about 60 cents apiece, would cost over \$130 to replace.

To put it mildly, he's excited.

"Last year was the best for ice fishing in about 20 years," Johnson said, "and I think University Bay on Lake Mendota is the best place in the state for ice fishing."

He recalled a time 30 years ago when that particular area played host to over 1,000 ice anglers who took their limits of perch with ease. He related stories for nearly two hours of huge fish caught and those that lived to swim another day.

One story, however, stands out. It was a winter several years back when big crappies, all nearly 12 inches long, lined up around anglers' lines to be caught. Johnson literally fished and filleted until it hurt.

"I caught so many crappies that year," he said, "that I'd fill up small plastic bags with fillets and give them to little old ladies. We had tremendous fish fries with the whole neighborhood over."

"They thought I was God," he said with a laugh.

"I kept at it for about two weeks, but my hands got sore from the fish spines, and they got raw from cleaning."

"I finally had to stop because my hands got so sore I couldn't close them."

"And that's the truth."

Which proves another point about the effects of ice on life forms: it causes them to stretch the truth.

Thomas Vanden Brook is an editorial intern with Wisconsin Natural Resources magazine. He resides in Madison.

A cottontail rabbit managed to beat the dead of winter. These tracks were seen along a stream in the Northern Unit of the Kettle Moraine State Forest. Photo by Dennis Yockers



Winter tracking

Have you ever wondered how wild animals live in various parts of Wisconsin? You can learn about them without actually seeing them — through winter tracking. You may not discover every single wild critter, but by following deer, grouse, pheasant or fox tracks after a snow, you'll be surprised what you can learn about their habits.

Many DNR wildlife areas scattered throughout the Badger State are perfect spots for winter tracking. You may be able to find tracks of birds such as crows or pheasants; predators such as foxes or coyotes; large mammals such as deer; or even mice. On a clear, cold day tracking can be exciting and informative.

When my associates and I followed 109 miles of red fox tracks for four win-

You can learn a lot from the tale of the trail.

Chuck Pils

ters in southern Wisconsin, we found that foxes killed mice and voles once out of every five attempts. We also discovered the remains of 11 cottontails, two unknown birds, one dove, one pheasant and strangest of all, a great horned owl!

We never did determine whether the fox fought back after being attacked or the fox attacked the owl on the ground. One thing was certain; the owl died of puncture wounds made at the base of its skull. We also learned that foxes were not fussy about eating carrion including pigs, deer, raccoons and opossums.

Although you probably won't track animals for long periods, even part of one day spent tracking can yield a surprising amount of information concerning animal habits.

It doesn't matter which part of Wisconsin you use for winter tracking; just use the following guidelines to make your outdoor experience meaningful:

1. Read *Mammals of Wisconsin*, by H.H.T. Jackson (University of Wisconsin Press, 1961) to find out which mammals live in your area.

2. Review any animal track guide before you begin tracking. Better yet, attend any available courses on tracking or talk to your local naturalist.

3. Dress like an onion (in layers). Remember that you will be walking a lot, so

don't wear heavy clothing like a down jacket. Talk to a cross-country skier for specific instructions. You should also wear rubber boots, sun glasses and carry a lightweight camera and/or binoculars (you may see a critter or two!). Bring a small notebook and pencil along to record your findings.

4. Frozen wetlands are excellent areas for tracking; however, be careful about thin ice.

5. Go tracking 24 hours after a snow-fall of less than six inches.

If you follow these bits of advice, you will discover a little used way to enjoy nature during the winter.

Chuck Pils is a DNR fur resources specialist based in Madison.





The DNR's MacKenzie Environmental Center staff recommend these books on wildlife tracking:

A Field Guide to Animal Tracks, Olaus J. Murie (*The Peterson Field Guide Series*), Houghton Mifflin Company, 1954. *Very comprehensive background information on tracks and tracking.*

A Guide to Nature in Winter, Donald W. Stokes, Little/Brown Company 1976. *Not only has a great section on the winter activity of animals, but also shares information on winter insects, birds, snowflakes, fungus and more!*

Track Finder, Dorcas Miller, Nature Study Guild, Box 972, Berkeley, California 94701, 1981. *A guide to mammal tracks of eastern North America. Good for beginners, especially children.*

Animal Tracks and Hunter Signs, Ernest Thompson Seton, Doubleday, 1958. *Nature lore and tracking by this famous nature author.*

Field Guide to Tracks of North American Wildlife, Myron and Charles Chase, Nasco Nature Study Aids, Fort Atkinson, Wisconsin, 1969.

Animal Tracks and Signs of North America, Richard P. Smith, Stackpole, 1982.

Animal Tracks, George Mason, Morrow, 1943. *Grades 5 to 9. Mason has also published the following books: Animal Homes, Animal Sounds, Animal Habits.*

Identifying Animal Tracks, Richard Headstrom, Dover, 1971.

Track Watching, David Webster, Franklin Watt, Inc., 1972. *Elementary.*

Crinklefoot's Book of Animal Tracks and Wildlife Signs, Jim Arnosky, G. P. Putnam's, 1979. *Elementary.*

Big Tracks, Little Tracks, Franklyn Branly, Scholastic Book Service, 1975. *Grades K to 3.*

Guide to Animal Tracks. Stackpole, 1976.

Clockwise from upper right: Skunk tracks, early spring, by Greg Scott; wolf track by Lynn Rogers; beaver print in snow by Dennis Yockers; muskrat track by Dennis Yockers; bird tracks by Bob Wallen; making a cast by Dennis Yockers



Casting animal tracks, a lasting impression

Richard C. Mulhern

For weeks now, you've wanted to search out a sign of your tuneless country neighbors, the coyotes.

The idea of spotting and photographing a nice, sharp track or two sounds appealing.

But wait.

There's more than one way to record your furry neighbors' intriguing footprints. How about making a plaster cast?

"Not for me," you think, "casting would be much too difficult."

Not so. If you have the interest and some simple, inexpensive materials, you're well on the way to making beautiful print casts for your office or den.

Here we go —

Take a scavenger hunt through your home and collect these materials: spray shellac or spray plastic, plaster of Paris, a couple of mixing containers (old tin cans are fine), precut cardboard strips (two inches wide, about 10 inches long), spray bottle for misting water, stirring stick and jackknife.

These supplies are optional (you'll see why) — a few paper clips, sandpaper, petroleum jelly, loop of wire, vinegar, salt and small eye screws.

Once you've rounded up the materials, you're halfway home. Now, here's the process:

1. Look for a good track in heavier soil or fairly heavy snow.
2. Once you find a track, clean it of loose particles of soil, twigs, leaves and other litter.
3. Spray the track with shellac, cold water or plastic.
4. Prepare a collar from the precut cardboard. Fasten the collar in a circle with paper clips and tap gently into the soil or snow surrounding the track. When casting in snow, the temperature must be well below freezing, and the track should be misted with cold water from the spray bottle and allowed to freeze for five to 10 minutes. Misting should be done before placing the collar around the track. Press collar firmly into the ground to give support, but make sure at least one inch extends above the ground to form the edge of the mold for the plaster.

5. Now, mix about two cups of plaster of Paris and cold water in container. Sprinkle plaster into water without stirring until the proportion is about seven parts plaster to four parts water. Stir the mixture gently with a stick until it is smooth, like

pancake batter or pudding. Adding a few drops of vinegar to the mixture slows hardening, if you think it will take a lot of time to pour the mix. Adding a pinch of salt speeds it up, if you're casting in snow. Add either just before pouring.

6. Pour the plaster into the collar, filling the track first. If you're casting a Christmas ornament, just fill the track itself. If you're making a paperweight, fill the collar to 3/4-inch thickness. Tap the collar gently to force up air bubbles and to settle plaster into small areas of the track. A paper clip can be inserted at an angle into the edge of the wet plaster to serve as a hanger, or place the small eye screws near the edge of the cast as the mixture starts to set up. The cast should be dry in 20 to 30 minutes, an hour or more in cold weather. If you're casting in damp soil, hardening may take longer.

7. When the plaster has hardened, loosen the soil or snow around it before removing the cast. When the cast is completely cured, lift it out carefully and brush off any excess soil. Later, clean the cast by scraping it with a knife blade and washing it with a damp cloth.

There, now you have what's referred to as a "negative" — a raised likeness — of the track. You can take the next few steps if you want to create a likeness of the actual, sunken track.

Apply a thin coat of petroleum jelly to the surface and track of the cast. Place it on a flat surface and surround the casting with a two-inch strip of cardboard.

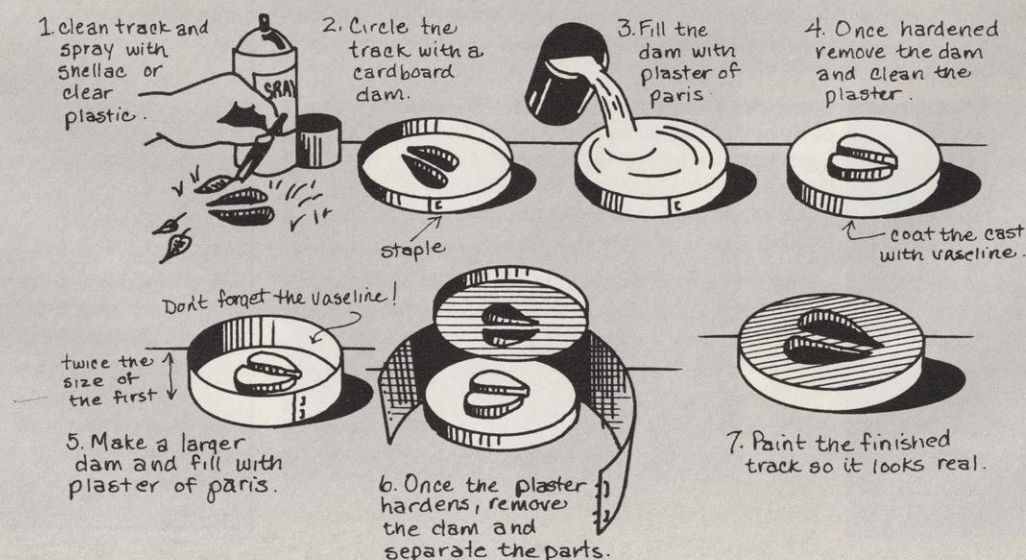
Mix plaster of Paris and pour into the mold, making certain that the top surface of the casting is smooth and level with the mold. If you plan to use the casting as a wall plaque, place a loop of wire or small eye screws in back of the casting while the plaster is still soft. Allow two hours for plaster to harden.

Carefully remove the mold when the plaster is dry. Separate the two layers and wipe the excess petroleum jelly from the face of the cast and track. Scrape any rough places with a knife blade, or use fine sandpaper to smooth the surface. Wash the completed cast in running water.

When your creations are thoroughly dry, a coat of clear shellac or clear plastic may be applied to protect and preserve them.

Basically, that's it in a nutshell. Happy trails.

Richard C. Mulhern is an editorial assistant with Wisconsin Natural Resources.



Readers Write

■ Re: your September/October cover, this loaded gun could have gone off, killed the photographer and deprived (the gunmaker) of holding us all at gunpoint in our homes. What ever happened to treat every gun as if it is loaded and never aim at anything you don't intend to shoot!

Don Schleiss
Rice Lake.

■ As a sportsperson, hunter, shooter and, certainly nonetheless, a Wisconsin Hunter Safety Instructor, I find your September/October cover photo of an individual "aiming" a rifle at any prospective reader despicable. It's in bad taste for an agency pledged to the safety, welfare and good conduct of state shooters to use a cover photo that violates one of the cardinal rules of "safe" gun handling.

Larry J. Severtson
Spring Green, WI

■ I am saddened to see any muzzle loading weapon being fired without protective eye guards. To show the use of the weapons without protective glasses must be unacceptable to many readers of your publication. Having used black powder weapons for over 40 years, I would correct such behavior in any hunting camp or shooting match I was at.

Allan G. Skinner
Anchorage, AK

■ I have been a hunter safety hunter instructor for 20 years, and while I am not a fanatic, I do not like staring down the muzzle of a firearm even in a picture (S/O cover). It is very frightening to me. This picture is counter productive to the three basic rules of hunter education and safe gun handling practices, which simply stated are: 1) Treat every gun as if it were loaded, 2) Always point the muzzle in a safe direction and 3) Be sure of your target and beyond.

Ron Wunrow
River Falls, WI

We received several letters about this cover. Of course, our intention was to produce a dramatic, tasteful photo highlighting Mr. Huebing's artistry in wood, metal and authentic clothing. That's why the photo highlighted Huebing's eye and gun sights, not the barrel. The rifle was not loaded nor was photographer John Beth in any danger. But that's what a lot of people thought before they had accidents. Our writers are absolutely right that all arms should be treated as if they are loaded. We'll use a slightly different viewpoint for our future photos.

■ Especially appreciated "A Hike through Central Wisconsin History." Last week we took a trip through northern Wisconsin and hiked part of the Ice Age Trail near the Grandfather Falls hydro plant. The 1987-88 federal duck stamp picture by Anderson certainly makes this your most outstanding issue. Keep up the good work.

Frank L. Carlson
La Crosse, WI

Sincere thanks to our readers who patiently awaited our November/December issue on Watchable Wildlife. Unavoidable delays all along our editorial and production schedule meant that most of you did not receive the issue until after Christmas. We apologize for that inconvenience. I assure you we are making every effort to get back on schedule.

David Lawrence Sperling

■ I always find your magazine enlightening and interesting. The article on the "tension zone" particularly caught my attention. But I was surprised to find a statement implying that we in the north have no oaks.

I live in Oneida County well north of the "tension zone." We do have many oaks of several species in the Wisconsin north — the northern pin, white, red and scarlet oaks — which seem to be native to a good part of the north. White oak acorns are a favorite fall food of white-tailed deer in the north where farmers' corn fields are scarce.

One deciduous tree that is a highly visible and specific indicator of the area north of the zone is the birch. Pampering is usually needed to grow most birches in areas south of the zone, but no help is needed in the north.

Elmer A. Goetsch
Three Lakes, WI

■ Three cheers for running the sustainable agriculture article. I believe this is the foremost land use challenge of the 1990s and not just for farmers but everybody who cares about farmers and natural resources. Putting the article in WNR means an important new readership is exposed to the mission. The sequels should tie sustainable agriculture even more intimately to DNR management objectives. It's a marriage made in heaven.

Dale Marsh
Madison, WI

■ The special report published in your September/October issue on the Wisconsin conservation warden force was both interesting and informative. Many times the impression we have of the warden is that of an official waiting to "catch us in the act" of breaking a conservation law and not of someone who would prefer to teach us to understand and obey that law first. Providing the general public with a clearer understanding of a warden's job can only help to reinforce the idea of the warden as an educator and not someone solely interested in arresting violators.

Jan A. Schock
Rice Lake, WI

Readers Write

■ I enjoyed the beautiful photo section in the July/August edition feature "Explore the Wonders of South-eastern Wisconsin." A real "wonder," however, is the photo showing the large sailing vessels, salmon fishermen and lighthouse in our Broughton Sheboygan Marsh Park!

We are most proud of that facility, which now provides a new restaurant and tavern, a meeting lodge, 64 campsites, picnic and playground areas, canoe and boat rentals, fishing piers, snowmobile trails, and excellent small and big game hunting on some 13,000 acres . . . much with financial aid from DNR and local conservationists. However, it lies nearly 25 miles inland (near Elkhart Lake). Our expansion plans have not yet extended it to Sheboygan's beautiful waterfront, which is shown on your photo.

Mark J. Leider
Sheboygan, WI

■ I just finished reading the special edition of WNR on the 50th anniversary of the Pittman-Robertson Act. It is truly an outstanding treatment of this federal program. The various stories, all well-written and illustrated, accurately portray the diversity of activities and efforts supported by this extremely important federal aid program.

Please pass along hearty congratulations to all those involved in putting together the special edition and my sincere thanks for their efforts on behalf of the Pittman-Robertson program.

Frank Dunkle
Director,
U.S. Fish and Wildlife Service
Washington, DC

■ Your September/October article on Aldo Leopold's 1947 speech, "The Ecological Conscience," was excellent. He clearly understood the failure of soil conservation policies and the challenge of instilling a conservation ethic into the hearts and minds of the people.

Although our society has not yet developed a true conservation ethic (as evidenced by irresponsible polluters and toothless public policies), some progress is finally being made on soil conservation. In fact, many county land conservation committees (LCCs), which replaced soil conservation districts in Wisconsin in 1982, are now going further in developing and enforcing conservation rules than state laws require, and they are doing it in many cases with very little support from the state. Furthermore, the 1985 federal farm bill established tough new soil conservation policies that will affect the majority of farmers.

Finally, if Leopold were alive today, it is my guess that he would be more outraged by polluting corporations, "me-too" politicians and bureaucracies than with LCCs or farmers.

Glenn Stoddard
Madison, WI

■ I was very pleased to read, in your final salute to Jim Taylor, that the color spread of Harold Mathiak's clams is still one of your talked about editions. Thanks Jim, for that edition.

Marion E. Havlik
La Crosse, WI

■ The top picture and comments on page 19 of the July/August 1987 issue seem to miss the point that a septic system drain field must be operative, and if it is not, ponding as shown will result. A working drain field is very important, and a non-working drain field is, perhaps, the real cause of septic system failures. I did enjoy the story, however, and always look forward to receiving the WNR publication. I would agree with those who would require a professional inspection of existing well and septic systems upon sale of residential or other properties not connected to public utilities.

H.R. Pagel
Neenah, WI

■ Everyone at our house loves your magazine but we would really like to see you spend less time fishing and hunting and do more articles on our endangered and protected species. My husband and I are avid bird and wildlife observers; our special interest is birds of prey. I am always surprised how little the average person knows about these creatures, but how interested they are to learn. People should be told where to go to see the best fall migrations. The first time they see an eagle or a peregrine and learn some interesting facts, they start to care, and that can make the difference. Bird watching is the number one pastime in this country.

Vicki and Rick Kozellka
Prairie du Chien, WI

We sure hope you enjoyed our Watchable Wildlife issue.

■ DNR certainly shares Donald Smith's concerns about agricultural pesticides and livestock manure in our waterways, which he expressed in a July/August "Readers Write" letter. However, the situation in southwestern Wisconsin is complex. Both natural and man-induced factors influence bass populations. We believe a great deal remains to be learned, and we want to sort this out, identify correctable problems and propose solutions.

Pesticide use is widespread, but we don't have hard evidence of its adverse impacts on bass. Even some of the pesticides toxic to bass breakdown rapidly following field application and haven't been traced to streams or linked to fish kills. We know that livestock operations have caused bass mortality, but we don't know the true extent, importance and impact of this factor.

These streams hold more than professional interest for me because I was born and grew up, many long years ago, on the Pecatonica River in Lafayette County. Dr. Smith, other concerned citizens and DNR share a common goal to learn more about and someday solve environmental problems of smallmouth bass. We are all interested in ensuring the opportunity to go to that scenic country in future years to hook into one of those scrappers.

Jack Mason
DNR Bureau of Research

**Blanding's turtle tracks
at the Blue River.**

Photo by Robert H. Read

■ Thank you for publishing my Blanding's turtle article in the July/August issue of WNR. I have received numerous comments on it, which prompts me to clarify several points as they appeared in the printed article.

The phrase "only one in ten eggs hatches" is incorrect. Twenty-two percent of observed nests in a Michigan study produced hatchlings. Hatching success is not directly related to nest predation of which up to 93% has been observed.

Secondly, wetland drainage has probably eliminated many Blanding's turtles from Wisconsin. Predation of adult Blanding's turtles is very low as evidenced from field observations of nesting females and the species' longevity. Predation of nests is high, although this species appears to be able to cope with this phenomenon as it has been associated with the species for quite some time.

Thirdly, aestivation is not solely related to dry periods. Often, high temperatures and food availability influence this behavior as well.

And, fourthly, Blanding's turtle is probably not truly "threatened" in Wisconsin. The Bureau of Endangered Resources has the turtle listed as threatened because so little is known about its status.

David A. Ross
Wisconsin Rapids, WI



NEXT ISSUE:

**A plan to improve Green Bay
What makes trout anglers tick
Air pollutants and maple sugar
Making good use of federal fish funds**



Winter scape on a logging road in the
Northern Highland - American Legion State
Forest. Photo by Dave Kunelius.

