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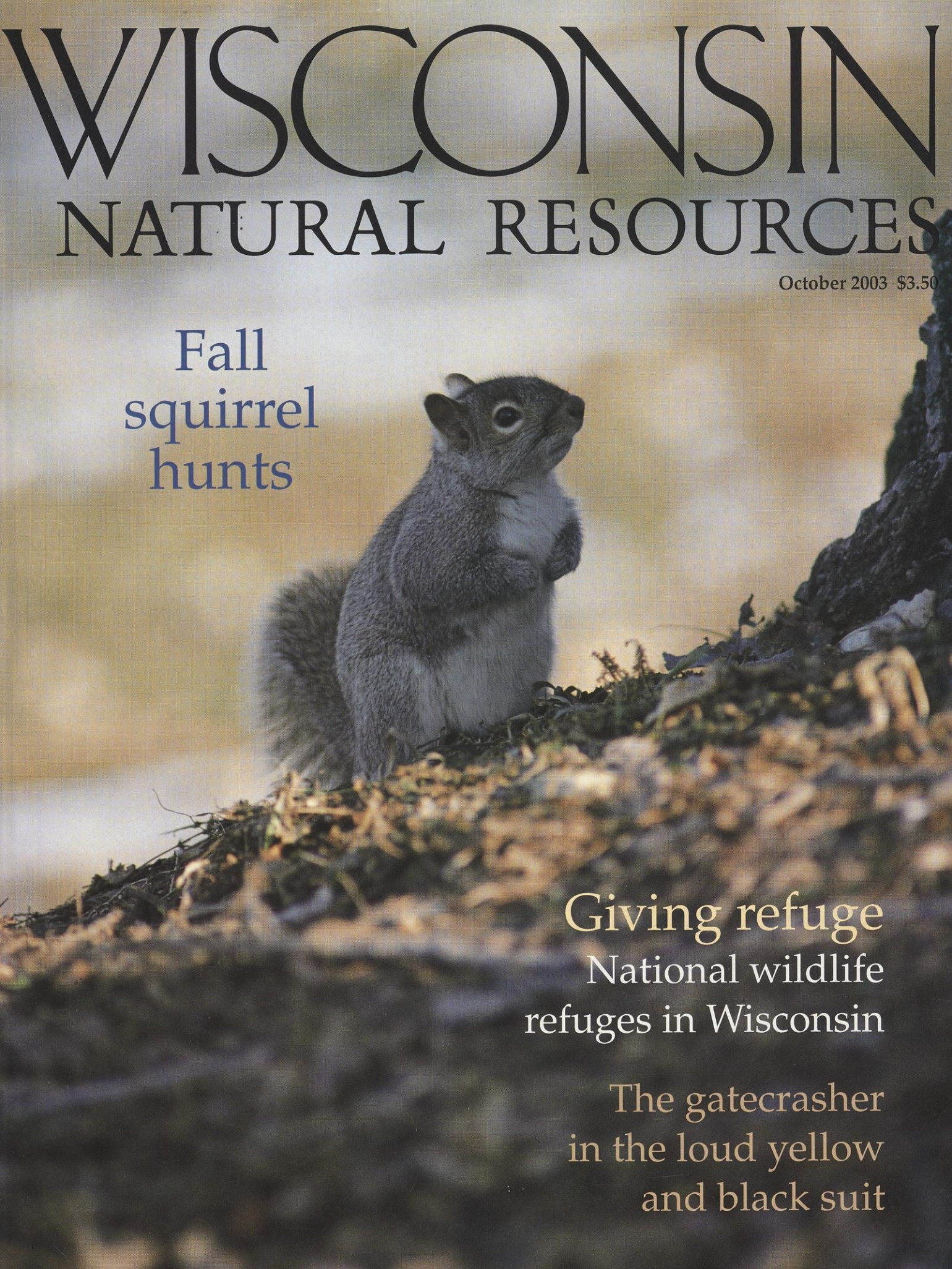
WISCONSIN NATURAL RESOURCES

October 2003 $3.50



Fall squirrel hunts

Giving refuge
National wildlife refuges in Wisconsin

The gatecrasher in the loud yellow and black suit

BOBBING, BUSTLING & BUSY

The semiaquatic water shrew is active all year even swimming under the ice on frozen creeks and streams.

Ann Bailey Dunn

Water shrews work the surface, shore and streambed in all seasons.

Among the unique creatures you may spy streamside, keep an eye out for water shrews, but you'll have to watch closely. They spend more of their time under the water than on it.

This five- to six-inch shrew is mostly aquatic and is active throughout the year. It swims, dives, floats, pops to the surface, runs along the surface (up to five feet, thanks to webbed feet) and will run along a stream bottom. In winter, this hardy shrew swims under the ice.

The water shrew *(Sorex palustris)* has large hind feet. The third and fourth toes are partially webbed and a fringe of stiff whitish hairs mat between the other toes to assist the shrew in swimming and provide warmth in winter. Guard hairs keep the shrew warm and dry trapping air bubbles in its fur. A microscopic view of the water shrew's guard hair in cross-section shows the hair is shaped like the capital letter "H". This provides a lot more surface area for air to adhere to each hair. So many air bubbles are trapped that the swimming shrew appears silvery under water like a speeding little bullet. On the other hand, all those trapped bubbles make the shrew extremely buoyant, and it can only stay submerged for about 48 seconds. When finished swimming and foraging, the water shrew stops, and trapped air bobs it back to the surface.

Water shrews dive and forage for aquatic insects, especially the nymphs of stoneflies, mayflies, caddisflies, crane flies and occasionally small fish in cool, clean well-oxygenated streams. Such delicacies are found by probing the bottom mud and crevices of submerged rocks with its nose. It also feeds on land for snails, earthworms and flies. The water shrew has to escape predators like weasels, hawks, owls, snakes and fish to survive.

Shrews live hard and fast. Like all shrews, their heartbeats race quickly, their metabolisms are fast and a "full life" lasts about 18 months. Water shrews may feed every 10 minutes,

continued on page 29

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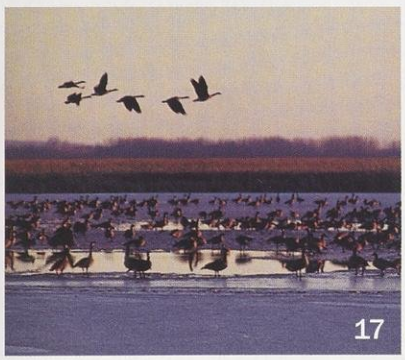

ROBERT QUEEN

CARMEN WAGNER

FRONT COVER: Gray squirrels *(Sciurus carolinensis)* prefer mature trees that provide nest sites and nuts.

HERBERT LANGE, Hazel Green, Wis.

BACK COVER: Sharp-tailed grouse use sparse grassland leks for their dancing grounds. *(inset)* Solon Springs Sharptail Barrens, Douglas County. For more information, contact the State Natural Areas Program, DNR Bureau of Endangered Resources, P.O. Box 7921, Madison, WI 53707.

RJ & LINDA MILLER, La Crosse, Wis. *(INSET)* © THOMAS A. MEYER, Wis. DNR

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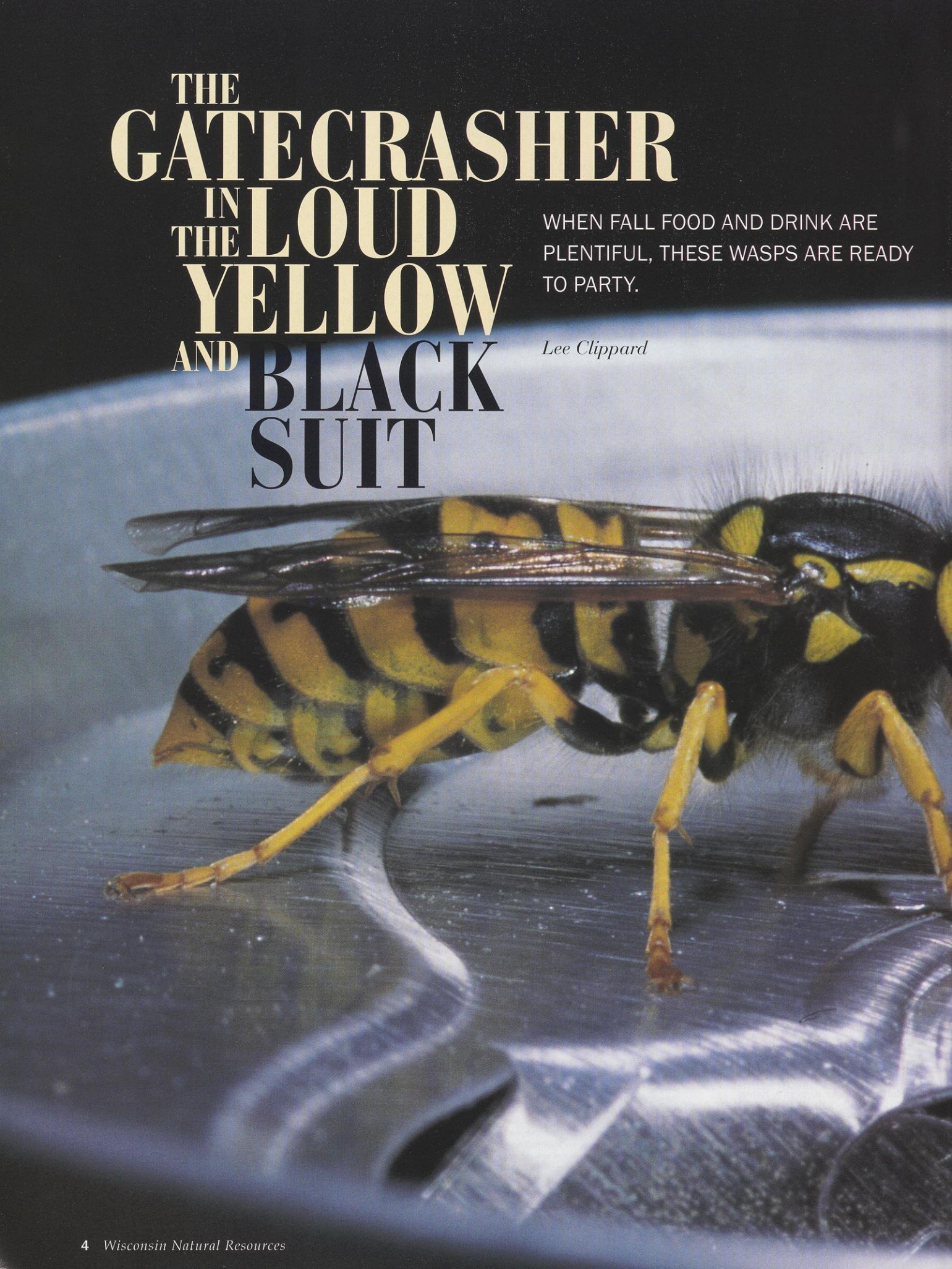
THE GATECRASHER IN THE LOUD YELLOW AND BLACK SUIT

WHEN FALL FOOD AND DRINK ARE PLENTIFUL, THESE WASPS ARE READY TO PARTY.

Lee Clippard



Come Saturdays in fall, folks from around the state swarm into Madison headed for football at Camp Randall. Cars line the neighborhood streets, red-clad crowds stream toward the stadium, and the distinct smell of tailgate-cooked brats and beer hangs in the air. But people aren't the only things swarming into the stadium on Saturday. Following those same smells are yellowjackets. When the game gets underway, there are plenty of shouts and cheers for the Badgers, but there are also a few yelps of pain when football fans come face-to-face with these pesky creatures.

Nancy Robinson, EMS Coordinator at Camp Randall, is well aware of the distress yellowjackets inflict. "On average, in August and September, the paramedics respond to two or three stings per game in the stands and about 16 patients will come into the first aid stations," says Robinson. The number of stings is likely higher, as football fanatics shrug off a sting to keep watching the Badgers push for the end zone. The yellowjackets are such a problem that between displaying touchdowns and field goals, the score-

In later summer and fall, sweetened sodas provide quick energy and "flight fuel" for these German yellowjackets *(Vespula germanica)*. Some native yellowjacket species stay in the countryside, but the invasive German yellowjackets have adapted to urban living and feed on sugar and protein food sources they can find readily in cities.

board flashes a reminder to fans: "Please make sure to check for bees in your beverages!"

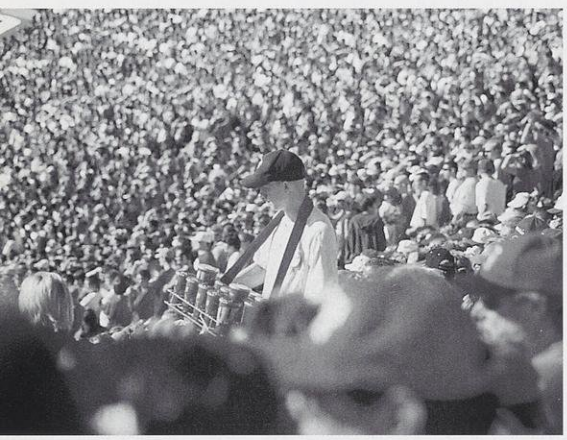
Know thy enemy

While there's no real harm in calling a yellowjacket a "bee," it gives the true bees a bad rap. If there's an insect hovering around your soda can this time of year anywhere in Wisconsin, chances are it's a yellowjacket. Yellowjackets are actually wasps, distant cousins of the bees, as both belong to the scientific group Hymenoptera.

Thirteen different yellowjacket species reside here and all are recognizable as little buzzing bullets with angry faces. They aren't covered with fuzzy hairs like bees. Instead, they are slender and slightly shiny. Most yellowjacket species boast distinct yellow and black banding patterns on their bodies, but some species are actually black and white. One ubiquitous yellowjacket in Wisconsin, a member of the black and white camp, is commonly known as the bald-faced hornet.

That said, identifying a yellowjacket wasp is difficult, especially if you are running away from it as fast as humanly possible! Several flying insects are often mistaken for yellowjackets: honey bees, bumble bees, and paper wasps. Honey bees are cute, furry fliers that make honey, beeswax and pollinate about 80 percent of our important agricultural crops like apples and alfalfa. Since honey bees only collect nectar and pollen, they are rarely, if ever, interested in human drinks and foods. Honey bees will sting, but usually only when heavily provoked, like when you mess with their hive or accidentally step on a lone forager. Honey bees, with their yellowish brown fur and docile demeanors, seem like teddy bears compared to the yellowjacket clan.

Bumble bees, just as their name describes, are fat, fuzzy critters that buzz around from flower to flower, and when loaded up with pollen and nectar, return to their little colonies in the ground. Bumble bees are often confused with yellowjackets thanks to their coloration and because, like some yellowjackets, they too nest in the ground. To add to the confusion, many Wisconsinites have grown up calling "bumble bees" yellowjackets. This must come from the fact that bumble bees, with their typical black abdomens and pale yellow thoraxes, look like they are actually wearing a "yellow jacket."

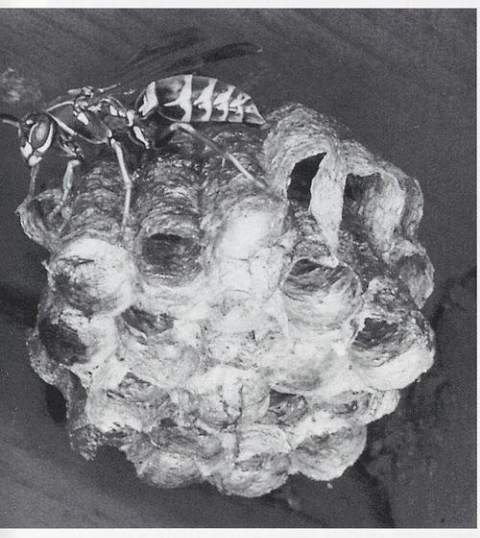


ROBERT QUEEN

(left) **A stadium full of football fans drinking sodas and eating brats is a perfect stationary source of sugars and fatty proteins for foraging yellowjackets.**
(below) **Nancy Robinson, EMS Coordinator at Camp Randall *(in red)*, tends to a fan stung by a yellowjacket that didn't want to share a snack.**

ROBERT QUEEN

SCOTT NIELSEN



DON BLEGEN

TOM DUERST

G. TRYGGESETH

Two bees and not two bees. *(clockwise from top left)* **A bumble bee on a coneflower, a yellowjacket in flight, a honey bee on an aster, and a paper wasp guarding its nest.**

Paper wasps are actually close relatives of yellowjackets. From a distance these slender, mostly hairless wasps resemble yellowjackets, but their nests are very different. Paper wasps build their nests on the warmer southern eaves of houses, and their homes aren't covered in paper — a habit for which yellowjackets are renowned.

A yellowjacket nest is one surefire way to distinguish the insect from all the other look-alikes. Even those who harbor hatred for the stinging fiends will admit that the yellowjacket nest is truly a beautiful work of architecture. Through a long process of scraping, chewing, mixing and building, the wasps create artful papery globes. The queen builds a small golf ball-sized honeycomb structure that is the core of a nest. Worker females add more paper, called *carton* by biologists, to expand the nest. The wasps manufacture the grayish carton by scraping up tree pulp and mixing it with their saliva. They

© ROBERT L. JEANNE

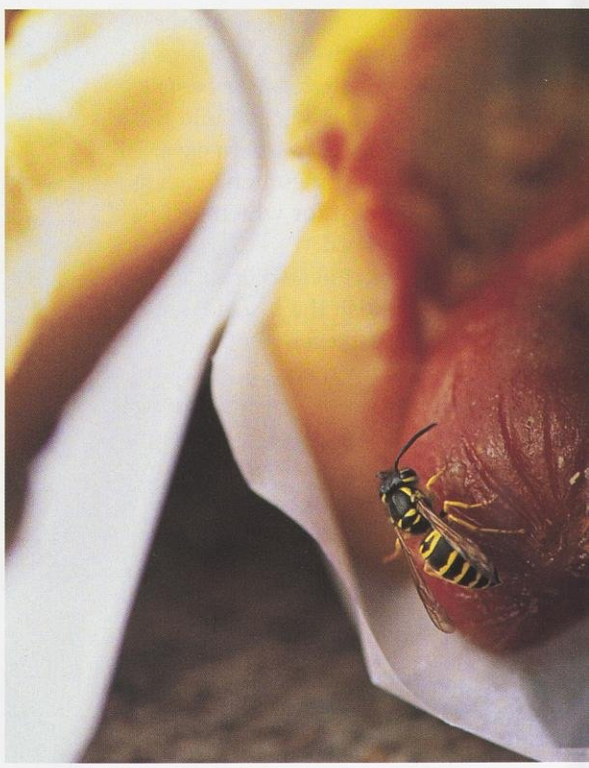
(above) Female workers tend yellowjacket eggs, larvae and pupae feeding them a diet high in fatty proteins.
(below) That's why yellowjackets will "prey" on hot dogs and brats. Researchers are studying how yellowjackets communicate the locations of food sources to other foragers back in the nest. The wasps' communication skills are not as well understood as the patterns and dances honey bees use.

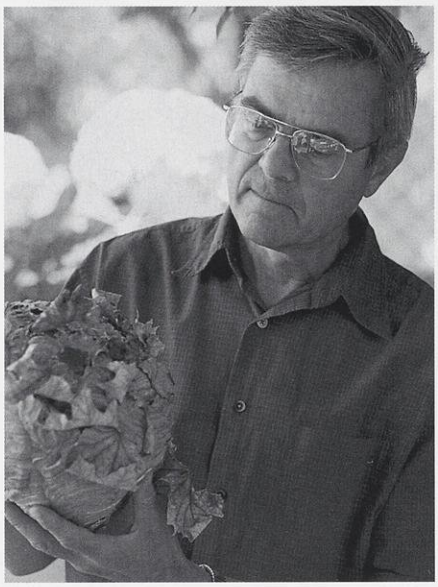
apply this mixture in papery thin strips that form stacks of combs to hold vulnerable larvae and sheathe the nest in a very strong protective cover. Depending on the yellowjacket species, the nest will hang from a branch, nestle inside a cozy wall crevice, cling to the side of a house, or go underground concealed in a cavity. Whether underground or in the air, most people recognize these as the classic "hornet's nest." The yellowjackets work hard to create this amazing nursery and home base, yet it is only used for a few months each year then stands abandoned like a factory out of commission.

A yellowjacket colony, like the Fourth of July, is an annual event that goes out with a bang. Colony life begins in the spring. When the snow and ice are just finished melting away, plump hibernating queens emerge from their winter slumber in search of a nice place to start a family (i.e., chipmunk hole, rotting tree stump or tree branch). Once the young queen finds a suitable spot, she builds a tiny paper nest by herself and then starts laying eggs. These eggs hatch into all female workers that help expand the nest and raise more workers. The colony grows larger and larger through the summer, and by late August or September, some colonies can hold 3,000–4,000 workers.

For people, wasps cause the most problems in early fall when the number of workers is so high. During reproduction time (the "bang" part of this cycle, which is typically September and October in Wisconsin), the colony starts producing males and larger females, destined to be future queens. When the new queens and males hatch, they fly away to mate. Afterwards, the males die, having served their lone purpose: insemination. The newly fertilized females, on the other hand, still have much to do before their biological role is filled: each new queen must find a snug place to hibernate over winter, while waiting to start a brand new colony in the spring.

Yellowjackets defend these great colonies using another unmistakable characteristic: their painful, powerful punch. When a bee stings, she sacrifices her life defending the colony. A bee's reverse-barbed stinger works like a bait-holding fish hook: it goes in but won't come out. On the other hand, a yellowjacket can sting again and again. This is why one wasp trapped in your shirt can get you multiple times. Since wasps aren't necessarily risking their lives to sting, they can afford to be a little jittery and aggressive. Yellowjackets





ROBERT QUEEN

Professor Robert L. Jeanne, entomologist at the UW-Madison campus, examines a bald-faced hornet nest. Some wasps build nests in trees. Yellowjackets are more likely to build underground nests.

will defend their nests from attack with a vengeance, but they will also defend themselves from attack (i.e., a mouth covering *their* soda can) when they are far away from the colony.

One wasp sting is painful enough. But get stuck with the thrust of an entire colony and you can end up in the hospital, or worse. The Centers for Disease Control in Atlanta report that 40–50 people die each year in the United States from allergic reactions to stings.

ROBERT QUEEN

Why do yellowjackets bother us so much?

Yellowjacket colonies survive by sending out foragers to scour the countryside for sweets and meats. The foraging wasps must collect enough sugar and protein to support the growing hordes of larvae, the busy workers, and eventually, new queens. To get their sugar fix, yellowjackets search out the sweet secretion of aphids and scale insects, called honeydew, which collects on leaves and branches as it falls from the sap-sucking insects. Hunting for other critters like caterpillars, spiders, centipedes, flies and damselflies provides the colony with protein. Foragers also sidle up to the bar with crows and vultures, and industriously carve away fleshy morsels from carrion with these other scavengers. And because yellowjackets are born to scavenge, they have one particularly profitable food provider: people.

As with other forms of wildlife, there is often a conflict between yellowjackets and people competing for the same space at a state park, a well-manicured back yard or a county fair. Where people abound, the wasps may eschew the search for honeydew and take the easy pickings of soda or other sweets in garbage, at a picnic table, and in a cup in a hand on the 50-yard line. They'll happily pull pieces of turkey right from between the slices of bread on a plate or munch away on a Johnsonville brat as if it was beer-boiled and grilled just for them.

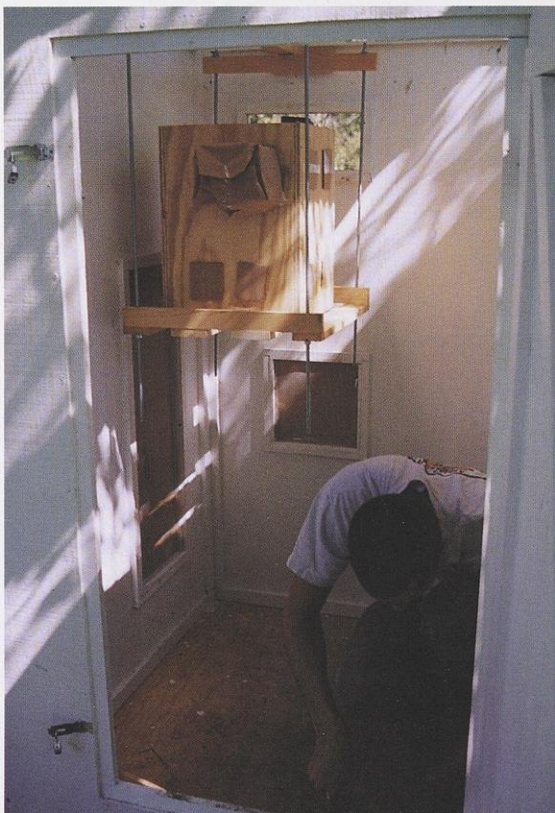
"The thing that's always been interesting to me," says Camp Randall's Nancy Robinson, "is the number of people who get stung in their mouths while eating their brats." For these wasps, Camp Randall is an all-you-can-eat buffet. Robinson jokes that there are so many wasps around the stadium during August and September that they must "tell one another to come down on Saturday morning."

She's not that far off.

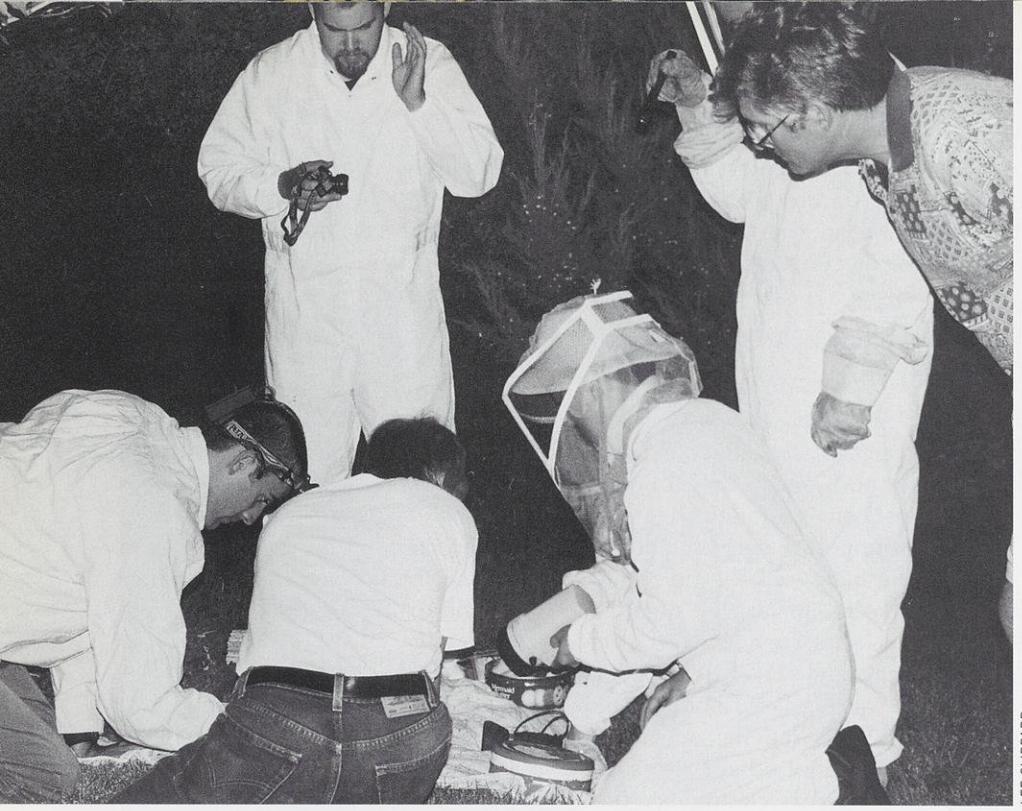
In 1998, Professor Bob Jeanne and Stephanie Overmyer at the University of Wisconsin-Madison confirmed Robinson's suspicion that some yellowjackets were in the know. Jeanne and Overmyer discovered that foragers of the German yellowjacket, an invasive species, somehow communicated to other wasps in their colony when there was sugar-water to be had. The researchers theorize it has to do with the odor of soda and other sweetened drinks. The means by which wasps recruit each other is still uncertain, but it's clear they can quickly communicate when and where food and drink might be discovered.

(top) Researchers study yellowjacket behavior by transporting their nests to field labs or offices. The wasps will use artificial entrances to their nests. *(Below)* Sealed windows under and around the nests can be opened to observe the insects' habits. Individual foragers can be marked and tracked.

LEE CLIPPARD



LEE CLIPPARD



LEE CLIPPARD

Entomologists work quickly to anesthetize an underground nest on a summer evening after wasps have returned from foraging. Nests are carefully excavated, a census of the population is compiled and nests are moved into observation chambers in the lab that same evening.

Those spots can be rapidly overrun by yellowjackets.

The German yellowjacket is a special pain, simply because it lives in close proximity with humans. This onerous wasp invaded Wisconsin in the 1970s as it spread from Europe to eastern North America and westward. It's considered an urban pest because of its propensity for choosing walls and attic spaces for nesting, though it will also nest in the ground.

"If you go out on the UW-Madison campus during the fall and collect what's coming to your soda, I would guess that 95 percent of the insects will be German yellowjackets," Jeanne says. "Yellowjackets use soda and other sweet drinks as a sort of 'aviation fuel' to give them energy for flying and harvesting. The fats and protein they collect are brought back to the nest to nourish the larvae. That's different from the food mix wasps find in the country.

"Out in the rural areas it's still pretty much the same food sources as were used before by the other yellowjacket species," Jeanne said. In fact, one researcher working in Jeanne's lab found that yellowjackets coming to traps in the urban area were almost exclusively German yellowjackets. Traps in other parts of rural Dane County were dominated by the native Eastern yellowjacket. That's not to say yellowjackets are pests only in larger urban areas, but the concentration of people and wasps in larger cities likely increases negative encounters.

Evening the score

You may notice outdoor malls and gathering places around Wisconsin peppered with yellow traps marketed for yellowjacket control. They're filled with sugar-water and other specially patented chemicals that will attract the wasps. Most of them are chock-full of wasp corpses come October. But do they help?

Jeanne says those kinds of traps thin out the worker population, "but you don't kill the colony." He estimates that for every 100 yellowjackets killed from a colony, the queen may produce 200–300 more wasps. "Killing a few thousand yellowjackets at a trap over the course of the summer isn't going to make a dent."

Traps won't likely solve any problems for you in September, but traps set out in early spring could attract enough queens searching for sugar to put a dent in the summer's yellowjacket population.

If a wasp colony isn't bothering anyone, the best thing to do is let it be. By the time the first freeze descends in fall, the colony will have sent out its reproductive males and females and will be at the end of its life. All the workers will die and nests, whether in trees, walls or underground, are generally not reused. After a hard freeze or two is the perfect time to collect old nests and donate them to a local science class.

Yellowjacket nests also can disappear naturally with a little help from raccoons, badgers and skunks that seek out the larvae. To these animals a nest full of yellowjacket larvae is one giant, juicy protein-packed lunch.

If the colony is wearing your nerves thin and the fall freeze seems too far away, the best way to get rid of the nest is to sneak up at night. The yellowjacket defense team is inactive below 50° F. Wasp nests can be quickly bagged in heavy plastic, frozen, left in the sun or poisoned with commercial wasp and hornet sprays. The safe bet is just to leave it alone. Definitely don't try covering a ground nest hole with a rock or plugging a hole in the wall with caulk. Wasps are extremely diligent and will quickly find a new way out of the nest cavity, either by digging a new hole or by coming into your house. For more specific recommendations about control techniques, check out the UW-Madison entomology website, www.entomology.wisc.edu, or send for the UW-Extension bulletin A-2018, "Wasp and Bee Control," by Jeffrey Hahn, Phil Pellitteri, and Donald Lewis.

Whether you're picnicking, at a football game or just relaxing with an afternoon beer by the lake, the best advice is simple vigilance. Bob Jeanne echoes the warnings of the Camp Randall scoreboard, "If you're just going out to a state park and opening up a picnic basket there's really not much you can do. Just be careful that you're not the only one drinking out of your soda can." And don't forget to check your brats, too.

Lee Clippard is a freelance science writer based in Madison.

The taste of autumn

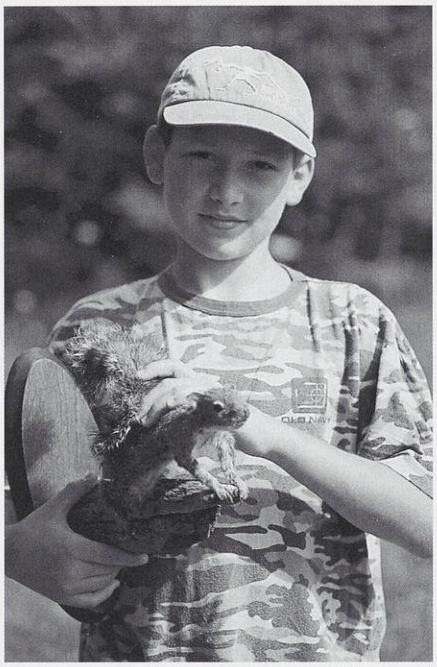
Squirrel hunts are great ways to enjoy fall days and teach new hunters field skills.

Mary Kay Salwey

Orion, the celestial hunter, rises low in the east this brisk October morning. He is absent from spring and summer morning skies, but shows himself again when the season of the hunt draws near. He's my spiritual guide as I head into the fields each autumn seeking the animals that will provide meat for the coming year. Most people can spot the three stars that form his belt. Off to the south, an arc of stars forms Orion's bow. He used simple equipment compared to the tube-fed, lever-action Marlin, the bolt-action Remington .410, the boxes of #6 shot and the .22-long bullets I load into the trunk.

This morning, I'm readying myself for a special hunt. My companions, nephew Keith (age 13) and niece Carissa (16) will accompany me into the wooded hill country in Buffalo County. Both are hunter education graduates and both are relatively new to hunting. Keith shot his first squirrel last year, and his folks sent it to the taxidermist. He's very proud of that mount. Carissa and I tried our hand at hunting squirrels two years ago in the woods

Author Salwey takes time during a squirrel hunt with her niece and nephew to point out squirrel behavior.



ROBERT QUEEN

To commemorate his first successful hunt, Keith had the squirrel mounted.

HERBERT LANGE

Gray squirrels are smaller and more common in Wisconsin than fox squirrels. Both species use their tails for balance, as warm blankets and umbrellas.
(right) Fox squirrels are twice the size of grays and spend more of their time in fields on the ground.

along the Mississippi backwaters. It was a cold, frosty morning. The swamp white oak woods, normally filled with squirrels, were disappointingly silent. But we enjoyed our autumn hike anyway. Today, we've come to hunt down dinner and enjoy watching squirrels.

Wisconsin is home to a number of tree-dwelling squirrels. The small, feisty red squirrel, *(Tamiasciurus hudsonicus)* is out during the day, generally in the northern pinewoods. Locals often refer to it as a pine squirrel. It's a little larger than a chipmunk and has a reddish-brown back with a light tan to white belly.

At night, flying squirrels swoop by to visit our feeders. Two distinct species call our state home...the northern *(Glaucomys sabrinus)* is a bit bigger (10–12 inches) and the southern variety *(G. volans)* is between red squirrel and chipmunk size. Here in Buffalo County, we might see either one. When dusk fades to night, I enjoy sitting outside in mid-summer to see them glide silently and swiftly into the feeders from higher tree limbs and hearing the quiet chip, chip, chip as they bite apart sunflower seeds.

But these species are strictly "looking" squirrels, and all three are too small to be hunted.

For table fare, most hunters select either fox or gray squirrels. The Eastern fox squirrel *(Sciurus niger)* has a rusty orange-tinged coat with a light yellow ochre to buff-colored belly. The Eastern gray squirrel *(Sciurus carolinensis)* has a dawn-gray back with a white underbelly, and a white eye ring. In my woods, the much larger fox squirrel is not as common as the gray; I may spot one for every 20 or 30 gray squirrels I see.

Their genus name, *Sciurus*, is Latin for "one who wears his tail above his head." Red and fox squirrels have beautiful bushy plumes for tails that they use for balance, as blankets to keep warm in winter dens, and as umbrellas during light spring showers. Gray squirrels have white-tipped guard hairs on their tails, while fox squirrels have rusty red-tipped guard hairs.

Fall and winter whereabouts

Squirrels nest in basketball-sized leafy nests (called *dreys*) in treetops and in tree cavities. Look for an entrance where wood is freshly chewed to keep back the growing bark. Also check the ground for squirrel sign — empty black walnut shells with two holes chewed in them, corn kernels in which only the germ end has been gnawed off, half-inch-long, dark pellet-like scat, and tracks. In winter, the novice wildlife watcher may have difficulty distinguishing squirrel tracks from rabbit tracks. The smaller front paws of a squirrel track are in parallel alignment, whereas a rabbit's front paws are usually skewed at an angle. Also, the rabbit's hind feet are larger than the hind feet of a squirrel. Finally, if the tracks begin or end at a tree, it's a dead give away that they belong to the tree-dwelling squirrel.

The more common gray squirrel weighs a little over a pound, while the fox squirrel is about 2–2½ times heavier. Being smaller, the gray squirrel often winters in live or dead tree dens. The fox squirrel seems more at home in open farmland woods; the gray prefers the cover of thick oak and hickory woods. Most reference books claim the gray is more adept at tree climbing, while the fox squirrel spends more time on the ground. A fox squirrel often feeds in cornfields adjacent to open woods where trees are far apart. If caught in the field, fox squirrels escape by scurrying along the ground. Grays tend to move high in the treetops, leaping acrobatically from one branch to the other.

HERBERT LANGE

Ease into hunting

Squirrel hunts are great ways to introduce kids to hunting. Too many times I've heard old-timers lament that kids today go directly from hunter education classes to deer hunting. They don't get the same sense of privilege as if they had slowly worked up from starting on small game hunts that provide time to learn the ins and outs of game hunting — reading signs, learning to be a careful observer, learning to listen, making hunting judgments, and above all, gun safety. After "education by observation," kids started hunting with a single-shot .22 rifle, or maybe a .410 shotgun, and would hunt squirrels and rabbits for several years before they were allowed to tag along to deer camp. Over time, they learned a sense of reverence for the animals they hunted. They learned deer hunting required skills and judgment that they had to "work up to."

You can start instilling that sense of reverence for game by taking your hunter education graduate along on squirrel hunts. Unlike deer hunting, where you have to wear special clothing and keep talking to a minimum, squirrel hunting is a lot like a stroll through the woods. No special togs required...a pair of blue jeans and any color of shirt, jacket and hat will do.

Gray and fox squirrels are active daytime creatures, though gray squirrels come out at dawn and fox squirrels later in the morning. They appear accustomed to people walking on trails through the woods. So as you and your child or young friend walk along on the squirrel hunt, you can talk as usual and continually review the important rules of gun safety: Treat every gun as if it were loaded. Always point the muzzle in a safe direction. Know your target and what's beyond. Keep your finger on the safety and out of the trigger guard until ready to fire. Especially watch where your child is pointing the firearm muzzle. Periodically remind him/her to keep the muzzle pointed up, down or in another safe direc-

ROBERT QUEEN

To steady young hunters' aim, Salwey recommends having them lean against a sturdy tree trunk or big branch.

The hunters make time to review safety rules and make sure there is unobstructed line of sight to take a clear shot.

tion. Ask them if the safety is on.

As for hunting techniques, they aren't complicated. You could read a lot of "how-to" articles that tell you to dress in special camouflage clothes, wear scent-stopping chemicals and use game calls to bring the quarry in, but life as a rural squirrel hunter is much simpler. I dress only for weather and water, and I don't bother about concealing myself from squirrels.

I recently queried our neighbor lady (age 80+) who still shoots raccoons on her farm about her favorite method of squirrel hunting. "Oh, nothing special," she replied. "I just followed the dog."

When I squirrel hunt, I take along my dog, too. Webster is just a mutt with some German shorthair in him, but he's sharp as a tack and loves squirrel and rabbit hunting. In fact, he's caught a number of both without my firing a single shot! On that first squirrel hunt with Carissa, we didn't see a single squirrel, but Webster caught her a rabbit that she proudly took home and had her mom cook that night. He caught a fox squirrel this fall that darn near jumped down on top of me. My dog is fast, and he's handy at locating squirrels I would otherwise walk by.

I can't say he's helpful in retrieving the squirrel to my hand. Plenty of times, I've had to snake my way into a tangled, prickly thicket to retrieve the squirrel from him...right under his smiling, proud nose and wagging tail. But he does draw the squirrel's attention so I can maneuver into position for a killing shot. A hunter can still enjoy plenty of success hunting squirrels alone. The dog just makes it more fun.

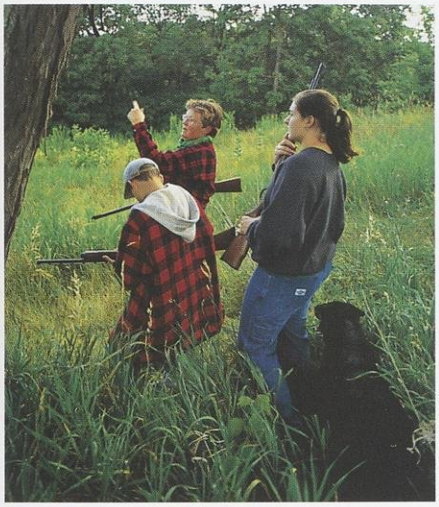
If you don't have a canine hunting partner, try the following techniques. In October, bushytails are busy making their winter nests and stashing nut caches. At peak nut time during hunting season, find a place in the woods with lots of oaks or hickories. Sit down by a large nut tree, prop yourself against it and wait. After about 10 or 15 minutes of quiet, the squirrels will resume normal activity. Watch for one coming out on a nearby limb about 10 or 15 yards away...certainly no farther than 25 yards. Raise your gun slowly to your shoulder, be sure no branches are in the way, wait for the squirrel to stop moving, and aim for a clear shot at the squirrel's head.

Start young hunters out with firearms equipped with open iron sights. A scope can be problematic; the inexperienced hunter may have a difficult time waving about the firearm trying to find the sight picture in the scope. Once you have the bead on the squirrel's head, gently squeeze the trigger. Never take chances of wounding a squirrel by shooting one that is running in the treetops. It is important to teach respect for the fellow creatures we hunt.

When the cold winds of November and the colder snows of December descend, you can practice this same sequence, but you will need to locate a den tree, rather than a nut tree.

Sitting and waiting for squirrels to become active definitely teaches children patience. It's a stark contrast to fast-paced TV shows and commercials that interrupt their attention every few minutes. On the other hand, squirrel hunting doesn't require as much patience as deer hunting, so it's a good way to help your young hunter learn the skills of sitting quietly and waiting. Definitely get him or her out squirrel hunting several times before going out to a deer or turkey stand!

If you hear a squirrel "barking" somewhere in the woods, you can try your hand at still hunting — quiet, slooooooww stalking. Place your foot carefully with each step until you see the squirrel and are within shooting range (30–75 feet). One problem in hunting without a dog is that a squirrel has infuriating ways of avoiding you. A squirrel will work hard to keep the tree between you and it. If you run into that dilemma, try picking up a branch or chunk of dead wood and toss it to the other side of the tree. If the squirrel is young and inexperienced, it just may come to your side of the tree, thinking that you (or some other predator) are now on the other side. That's your chance. By the way, squirrels also evolved some additional help. Squirrels have yellow filters in the lenses of their eyes that reduces glare and allows them to see well in low-light conditions.



ROBERT QUEEN

Make time to watch how the squirrels move, where they feed, where they nest and where they rest.

While squirrel season opens in mid-September (Saturday the 13th this year), I prefer to wait until mid to late October. First, in September, the leaves are still clinging to the trees making it much more difficult to locate squirrels than after leaf drop. Second, September weather is still hot and the woods are filled with mosquitoes. I prefer to hunt on sunny days when there is a slight coolness in the air. Third, I'm concerned about meat spoilage, so I feel much safer choosing the later, cooler months. Then too, I'm sensitive to the fact that late-nesting or second-nesting squirrels with young may still be in the trees if I hunt earlier. I'm not *that* hungry.

I encourage young hunting partners to use a solid tree trunk or branch for support. I coach right-handed shooters to lean their left, gun-holding forearm firmly against the tree while aiming at the squirrel. I prefer shooting a .22 caliber rifle because a single, well-placed shot to the squirrel's head means the meat will be undamaged. For a young hunter, a small shotgun, like a .410 or a youth model 20-gauge, may be easier and more rewarding — but shot-gunners have to watch for lead or steel pellets in the meat when they sit down to a squirrel dinner.

I'm rather proud that my husband Kenny, a highly skilled outdoorsman and my own hunting mentor, calls me a "crack shot" with off-hand shooting. He's amazed that I can balance myself, stand still enough to steady my shot without a supporting tree, and drop squirrels to the ground. I'm not as good at duck hunting. It's definitely harder to shoot a moving target than a still one. That's another reason to start young hunters with squirrel hunting.

Field dressing tips

Your aim in field dressing squirrels is to keep the meat clean and hair-free while getting the carcasses quickly skinned and cooled to dissipate heat. Squirrels are easier to clean when they are slightly warm and the skin is still supple. Prompt skinning and gutting keeps the meat tasty and less gamey because it prevents bacteria from souring the meat. I put squirrels in an open-weave gunnysack to keep the carcasses cooler.

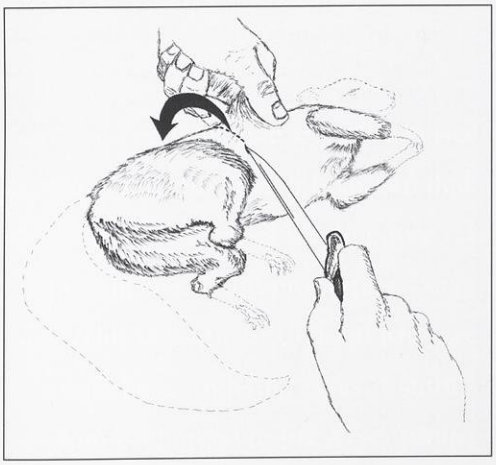
Skinning a gray squirrel is relatively easy. Use a small belt ax or a larger hunting knife to cut off all four lower legs, tail and head. Save the tail separate from the meat.

Lay the trimmed carcass on its side. Now take your left hand and pinch up a piece of skin from the side. With your right hand, stick the knifepoint through the skin as you lift it away from the body. Roll the carcass toward you, making a slit just through the skin midway between the front and back legs from near the belly. You want the knife tip to cut just under the skin over the back and down the other side as you roll the squirrel toward you.

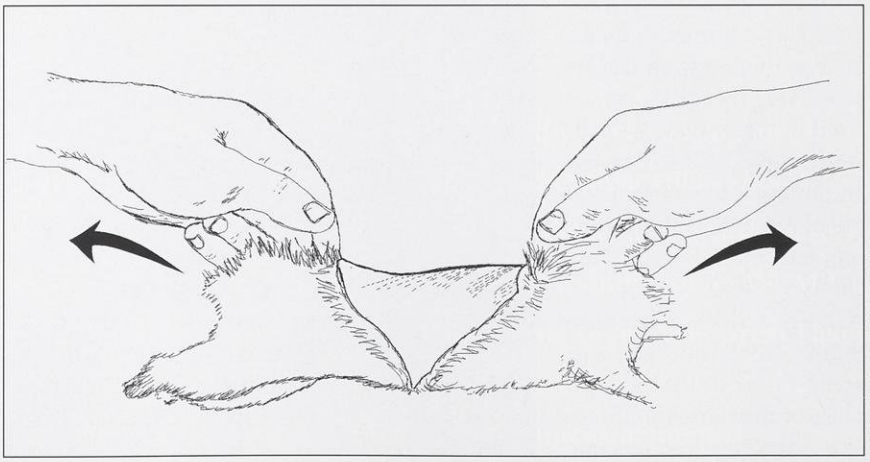
Now put away your knife. Take one finger from each hand and work your fingers under each back section to loosen the skin from the meat as you pull the two sections apart. After you have three fingers under each side of the skin, give one mighty yank, pulling your hands away from each other. The two sections of skin should pull off each end. You may find it necessary to cut the skin on the belly if it's too tough and doesn't separate during the pull.

After skinning, remove the squirrel's entrails by making a shallow cut from the lower abdomen up through the chest area. Discard the entrails, skin, feet and head in an unobtrusive manner in the woods to return a portion of your catch back to other creatures that will promptly pick up the remains. Place the cleaned carcasses in a clean plastic bread wrapper or plastic grocery bag,

After removing the feet, head and tail, field dress squirrels by gently lifting and slitting the skin midway between the front and back feet as you roll the carcass toward you.



Put down your knife, slip your fingers under the skin and pull the fur in opposite directions. The skin should slip off leaving a clean, hairless carcass ready for final gutting.



ILLUSTRATIONS BY THE AUTHOR

twist the bag closed and store in a cool place until you can freeze or cook the meat.

Save the squirrel tails, salt the butt ends, and freeze them flat. Mepps, in Antigo, Wis., is a large Wisconsin producer of fishing lures and they buy squirrel tails for 16–26 cents each to dress the hooks of their spinners. Company researchers have tested other materials, both natural and synthetic, and have found nothing comparable to the natural tail hairs of tree squirrels for use on the famous Mepps spinners. (See www.mepps.com and click on "squirrel tails" for details.)

At home, inspect the squirrel meat, trim off fat along the belly and the back of the hind legs. Also snip off the small glands under the armpits. Place the carcasses in salted water (½ cup salt per gallon of water) with a pinch of baking soda. Soak overnight in the refrigerator. This process helps draw out blood and leaves the meat fresh and pink.

The tasty finish

A lot of wild game cookbooks rave about fricasseed squirrel stewed in gravy until the meat falls from the bones. Squirrels are small and have equally small bones. To me, eating a squirrel with bones is on a par with the "excitement" of eating an unfilleted trout. I don't care to pick bones out of my meat at the supper table and I don't expect my dinner guests to do so. Therefore, ahead of the meal I cook and bone the meat. Even in that form, squirrel is a versatile meat that can be fixed in many ways — sauteed, stewed, slow-roasted and more. It was such a staple of rural diets that squirrels earned the nickname "limb chicken."

Here's how I prepare them: Rinse the light salt brine from the meat and place it in a large stainless steel stockpot. Toss in some dried parsley and chives from last summer's garden, a couple of slices of onion and a few chunks of green pepper. Sprinkle in ground black pepper, then add water to just cover the meat. Place a lid on the pot, bring it to a boil, then lower the heat and simmer the meat until it falls off the bone.

Cooking time depends on the type and age of the squirrels. My experience is that fox squirrels are tougher to skin and take at least twice as long to cook to keep them from coming out chewy. In side-by-side cooking comparisons, the fox squirrel definitely needs to be cooked almost three-and-a-half hours compared to an hour or two for the much more tender gray squirrel.

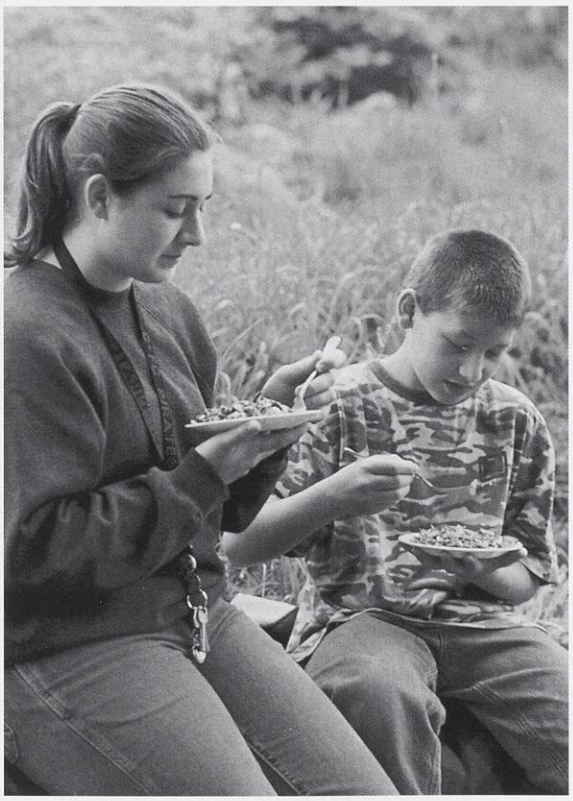
When the meat is fork tender, place a stainless steel colander into another pot and carefully pour the contents from the steaming pot through the colander. Drain the meat. Some people save the broth. Others substitute chicken, beef or vegetable broth in their recipes.

Place the seasoned broth back on the stove to boil. You can reduce this as a base for a sauce, but I like to concentrate the broth a bit and then use it to cook wild rice or pasta. Add wild rice (use a little more than two parts liquid to one part rice) and cook about 45 minutes covered until the rice is doubled in size, split and curved like a bowtie or banana. If you don't have wild rice on hand, good pasta will absorb nice flavors from the broth.

Meanwhile, set the colander of meat and strained vegetables into a bowl to cool a bit and let the last of the liquid drip out. Pick out the bones and shred the meat as soon as it is cool enough to handle. Heat up a cast iron skillet on the stove, and then add a pat of butter or two tablespoons of oil to the hot skillet. Saute some finely chopped green pepper, onions, celery and several crushed garlic cloves.

After the onions turn translucent, toss in the boiled squirrel meat. Add whatever herbs catch your interest. I like lots of ground thyme. For a gourmet treat, I'll add nonpareilles capers. If I want a little more zest, I substitute curry powder for thyme. At times, I will also sprinkle on some table blend herb mixes available in most grocery stores. I never measure my herbs, I just sprinkle them in and taste as I go. Add some of the rice stock to form a light sauce. For a creamier sauce, you can add a can of cream of mushroom soup slightly diluted with the stock. Either way, keep the skillet simmering on low heat.

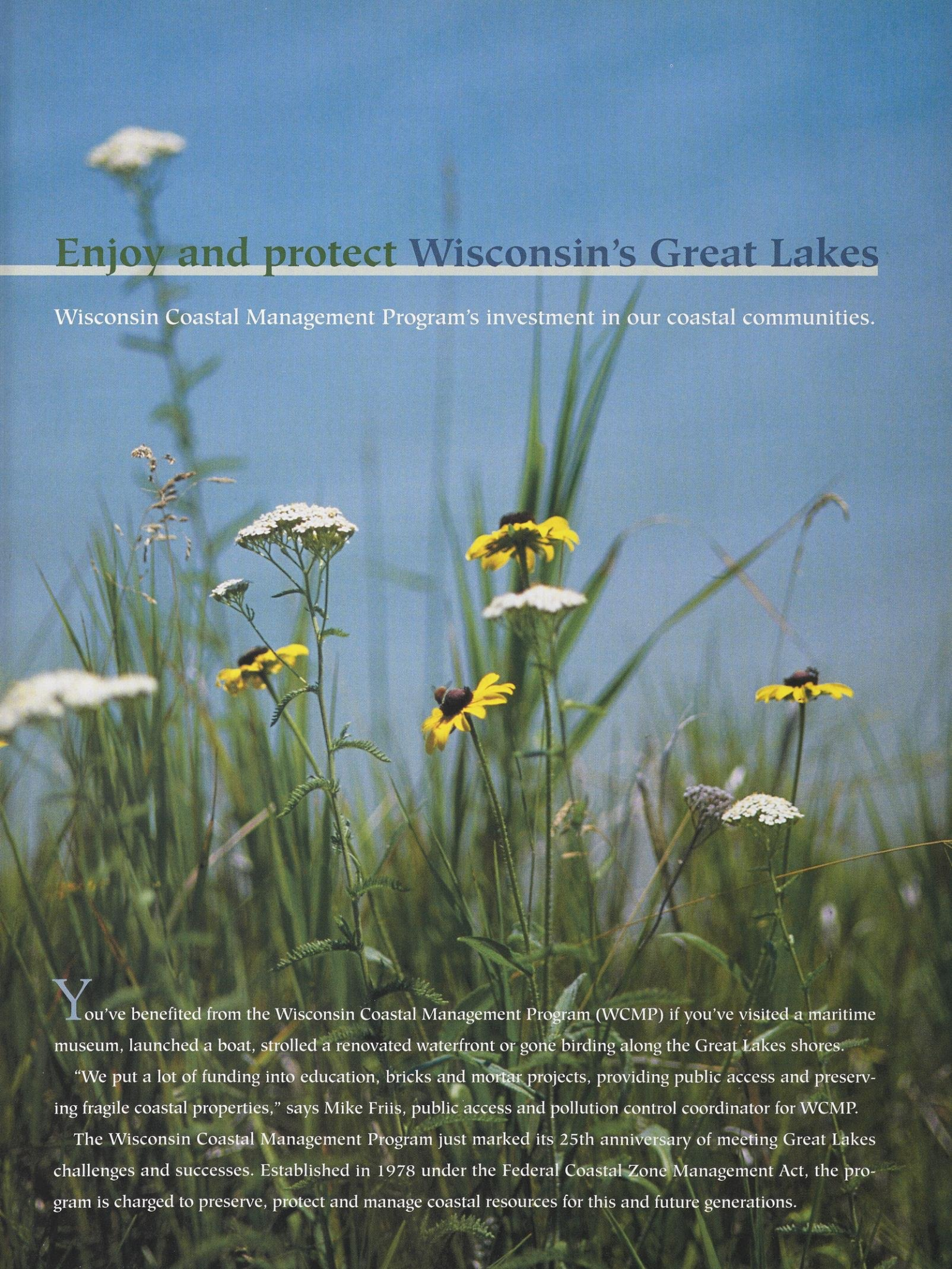
Finally, drain the wild rice and place about one cup on each dinner plate. Spoon the squirrel meat and sauce over the rice and enjoy...a true taste of autumn fresh from the field. I'm getting hungry...time to fetch Keith and Carissa and do some real huntin'!



ROBERT QUEEN

Squirrel meat is especially delicious when slow cooked in moist heat — boiled, braised, stewed or baked in casseroles. Carissa and Keith enjoy the author's squirrel and wild rice casserole with sautéed vegetables.

Mary Kay Salwey is DNR's Wildlife Education Specialist stationed at Alma. She and her husband aim to be as self-sufficient as possible by hunting, fishing and gardening in Buffalo County.



Enjoy and protect Wisconsin's Great Lakes

Wisconsin Coastal Management Program's investment in our coastal communities.

You've benefited from the Wisconsin Coastal Management Program (WCMP) if you've visited a maritime museum, launched a boat, strolled a renovated waterfront or gone birding along the Great Lakes shores.

"We put a lot of funding into education, bricks and mortar projects, providing public access and preserving fragile coastal properties," says Mike Friis, public access and pollution control coordinator for WCMP.

The Wisconsin Coastal Management Program just marked its 25th anniversary of meeting Great Lakes challenges and successes. Established in 1978 under the Federal Coastal Zone Management Act, the program is charged to preserve, protect and manage coastal resources for this and future generations.

Today, WCMP is part of the Wisconsin Department of Administration and advised by a Wisconsin Coastal Management Council whose 15 members represent state agencies, the state legislature, local government, tribes, the UW system and the public. WCMP annually awards cost-shared grants for a variety of projects. Last year, $1.6 million was available; in 2001, $5.7 million was shared to revitalize Wisconsin coastal communities.

Al Shea, administrator of DNR's Air and Waste Program, was among the first WCMP staff. He helped develop a dredging material disposal plan for Wisconsin's six largest Great Lakes ports, develop a 15-county inventory of natural areas and set a $1.2 million strategy for setting aside scientific and natural areas along Wisconsin's coasts. WCMP's work resulted in The Nature Conservancy purchasing wetlands to create the Mink River Estuarine Sanctuary in Door County. Shea led beach nourishment disposal projects at Kewaunee and Wisconsin Point on Lake Superior — the first of their kind in Wisconsin.

"The program helped develop waterfronts, parks and marinas. WCMP projects always had a natural resource flavor and a focus on access and recreation," Shea recalls. "And we had a lot of fun."

"I worked with Al Miller, the first WCMP director and aimed to help people see Great Lakes issues that were then invisible to them," explains Steve Born, now on the faculty at the University of Wisconsin and co-chair of the Waters of Wisconsin Initiative. "We became a pilot and model for connecting coastal management programs, especially those involving federal partners like the U.S. Forest Service and Army Corps of Engineers."

"For the amount of money invested, the returns have been pretty good," Born says.

Miller, who directed WCMP until 1984, says the program proved to be an example of good government. The council was a mix of representatives from agencies and local government overseen by a citizen advisory committee.

Early issues included putting the program together and coming up with a coastal management plan.

Wisconsin had shoreland zoning laws and erosion controls, but lacked a way to coordinate those programs consistently along the coasts.

WCMP also provided background work to form a Great Lakes Charter under which Great Lakes states and provinces collectively work to conserve water levels and flows on the Great Lakes and tributaries, and on environmental and shoreland development within the region. "We were the first state to have the laws and form the networks to make it work," Miller says.

(cover and here) Bluffs at Lion's Den Gorge in the Town of Grafton offer stunning views of Lake Michigan. WCMP funding helped preserve this 79-acre parcel for public access and future generations.

Feel the sand and sun

Providing access to coastal resources.

DNR FILE PHOTO

JIM MEEKER

(above left) Accessibility to coastal resources by creating walkways, piers, sidewalks and more across the state is a WCMP priority. *(above right)* The Kakagon Sloughs and Chequamegon Point are unique resources found on the south shore of Lake Superior. The sloughs are home to wild rice beds, birds and other wildlife. They also provide an on water learning experience when visited by canoe and kayak.

Not everyone can afford a waterfront house, but that doesn't lessen the desire to feel waves running through your toes, enjoy a sunset over Lake Michigan or explore Lake Superior's unique shoreline.

Coastal communities, state agencies, tribal governments, regional planning commissions, universities and technical schools, non-profit organizations and visitors benefit from WCMP's commitment to provide greater access to the coast.

WCMP helped underwrite costs so the light station in Port Washington, boardwalk at the Big Bay State Park on Madeline Island, and portions of Milwaukee's historic Third Ward riverwalk were more accessible to those in wheelchairs or having other physical disabilities.

Bob Bordeau, parks and recreation director for the City of Sturgeon Bay, credits WCMP funding for improvements at Sunset Park including a walkway, a new retaining wall, sidewalk and new grass at the park as well as supporting purchase of a parcel along the bay south of a shipyard that adds 600 feet of shoreline for public use.

Residents of Cornucopia in Bayfield County found WCMP a critical partner in preserving a place of fond memories — a beach where many locals learned how to swim. Ruth Oppedahl of the Bayfield Regional Conservancy says the site along the worn path from Highway 13 to Siskiwit Bay was for sale and locals worried how it would be used. The Conservancy, a land trust, sought ways to keep the land and beach open, Oppedahl recalls. Working with the Town of Bell, they were able to buy the land.

"WCMP was a fundamental player" that preserved 8½ acres of wetlands along with 50 percent funding from the State Stewardship Fund. The sandy beach runs for about two miles west toward Lost Creek.

"We gave the property to the town but we retained a conservation easement," Oppedahl says. "Now a new generation can look forward to learning how to swim where their parents once did the same."

Unique ecosystems

Discovering the wonders of wetlands and gorges.

At the mouth of the Kakagon and Bad rivers lies a Wisconsin treasure: the most extensive, least disturbed estuary on Lake Superior's south shore. These sloughs host vast wild rice beds prized by their caretakers, the Bad River Band of the Lake Superior Chippewa Indians.

Working with the Wisconsin Coastal Management Program, the tribe inventoried water quality and aquatic insect life.

Whether you drive, bike, hike or sail along Wisconsin's coastline, you can enjoy WCMP's partnerships to protect unique coastal ecosystems.

Dr. Donald M. Reed, chief biologist for the Southeastern Wisconsin Regional Planning Commission, says WCMP funding helped map the Lake Michigan shore to identify coastal wetlands. These maps define the wetland delineation process.

The maps are an important tool in a popular annual two-week wetland training program to teach local officials how to determine wetland boundaries. It takes training to identify seasonal wetlands that disappear during drier times of the year. Reed cites the Chiwaukee Prairie and Carol Beach interdunal area in Kenosha County as an area of special concern and value. The Chiwaukee is the largest native wet prairie of its kind in the Midwest and provides habitat for orchids and state-en-

dangered Blanding's turtle. The Nature Conservancy owns and manages the south parcel.

Coastal wetlands also are getting a boost from WCMP farther north in Ashland. "This office relies on grants and fees for educational programs that we produce," explains Cathy Techtmann, Northern Great Lakes Visitor Center's UW Extension education coordinator.

A new exhibit describes the value of freshwater sloughs using aquariums and a painted diorama. A companion environmental curriculum includes taking people into the estuary.

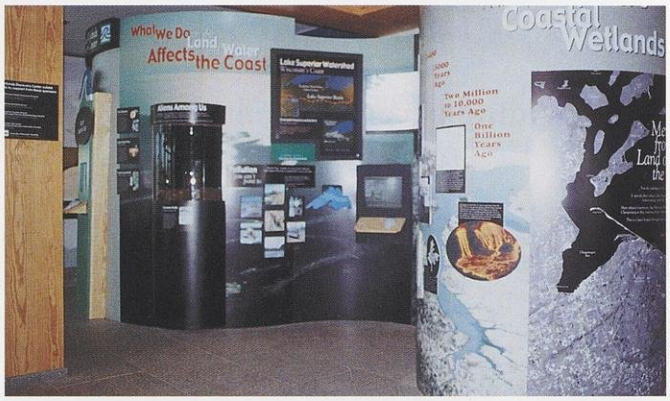
In addition to 120,000 visitors each year, the center produced and distributed a video and CD, "A String of Pearls: The Estuaries of Chequamegon Bay," with vignettes from people who love the estuary system. Techtmann also wants to develop a Lake Superior Leadership School.

"The coastal wetlands program at the Northern Great Lakes Visitor Center provides wonderful hands-on learning opportunities for school children and vacationing families," says Travis Olson, WCMP wetlands protection coordinator.

Andy Holschbach, director of planning, resources and land management for Ozaukee County, was similarly honored with WCMP grants. Holschbach and Ozaukee County were recognized with NOAA's Walter B. Jones Award for teaching about the hazards of building too close to Wisconsin's receding Great Lakes bluffs, for working to develop a way to use tree bark to process milkhouse wastewater, and for purchasing and protecting the pristine Lion's Den Gorge — a 79-acre parcel of undeveloped Lake Michigan shoreline property in the Town of Grafton. Here, stunning 90- to 100-foot bluffs look out onto Lake Michigan for more than a half mile. The northern part of the property contains a deep coastal gorge.

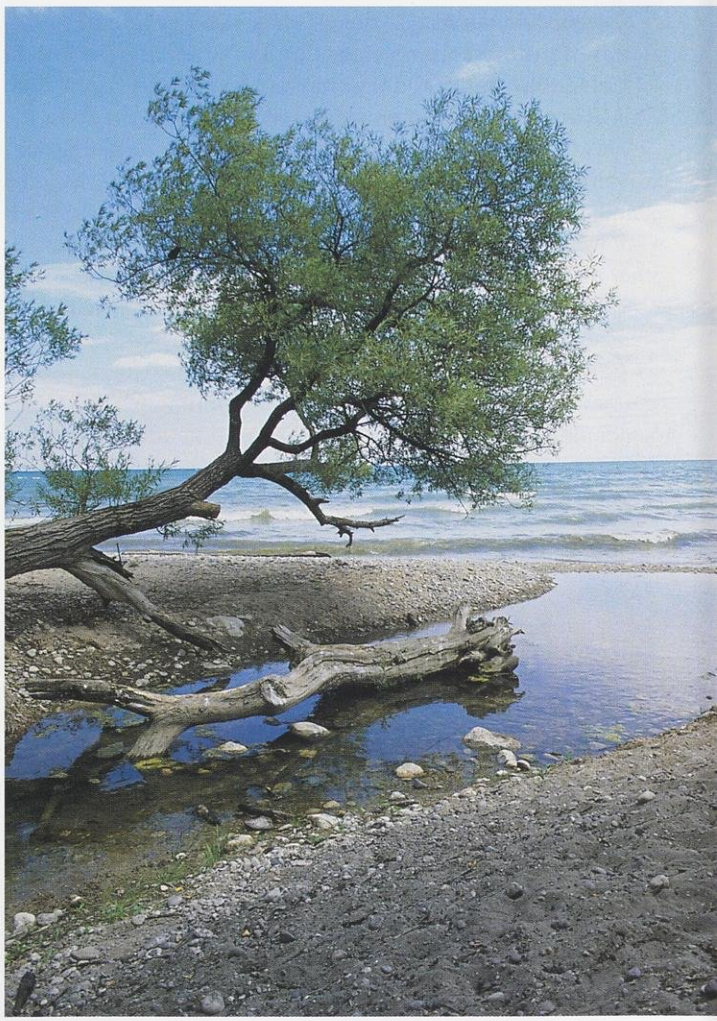
The $1.28 million Lion's Den Gorge purchase was made possible by a $404,000 WCMP grant, plus funding by the Ozaukee Washington Land Trust, Town of Grafton, Department of Natural Resources, and Riveredge Nature Center and Bird Club. Today, Lion's Den Gorge is part of the Ozaukee County park system and WCMP awarded the county $100,000 for improvements including a staircase, trails, wetlands restoration and parking lot.

"The Wisconsin Coastal Management Program," Holschbach stresses, "is open to unique ideas and has protected a unique place for the public and future generations."

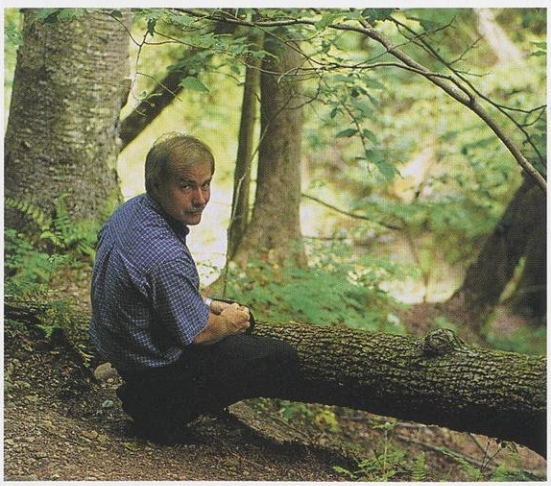


CATHY TECHTMANN

Above is one of two interactive computers featured at the coastal wetlands exhibit at the Northern Great Lakes Visitor Center. The exhibit also includes aquariums and a painted diorama.

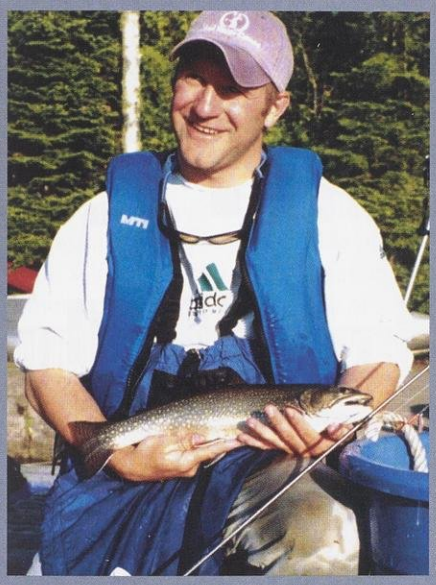


Andy Holschbach *(below)* accepted the prestigious Walter B. Jones Award on behalf of Ozaukee County. One reason the county was recognized was for leading the purchase and protection of the Lion's Den Gorge *(right)*. Holschbach echoes WCMP concerns about erosion and the dangers of building too close to receding Great Lakes bluffs.



ROBERT QUEEN

The Great Lakes as a precious commodity



GLENN MILLER, USFWS-ASHLAND

Andy Carlson, a Michigan Tech graduate student, caught this coaster brook trout in June 2002 in Tobin Harbor, Isle Royale. Carlson was helping with a yearly juvenile coaster assessment on Isle Royale and caught it with a small French spinner.

The Great Lakes contain roughly 18 percent of the world supply of fresh water. Only the polar ice caps contain more. "It's a precious resource," says Mike Friis.

WCMP's efforts to protect this resource range from erosion control to combating aquatic exotics and working with the Great Lakes Nonpoint Abatement Coalition among other partners.

Trout Unlimited is helping improve the health of a tributary to the Chequamegon Bay with trout in mind. They're working on coaster brook trout introduction to Lake Superior. Trout spend part of their life in streams that feed into the lake and part of their life in the lake.

"The numbers are few now due to habitat degradation and over fishing," says Laura Hewitt, the Midwest Conservation Director of Trout Unlimited. "Most streams of Lake Superior have been severely altered due to channeling for log running and more."

In 2001, Trout Unlimited and its partners wrote a WCMP grant to study stream stability and flooding. Recommendations included forest protection, road management, erosion control and stream channel protection.

Tom Ward, a conservationist for Manitowoc County Soil and Water Conservation Department, says WCMP funding is allowing that community to inventory and model wetlands. The project dovetails another — a strategy to implement the new Wisconsin nonpoint source standards. Beach closings is another issue that the county has gone to WCMP for support.

"WCMP took our idea and is helping us develop it," Ward says. "The funding got local people talking to each other."

Waterfront memories

Communities clean up waterfronts and savor waterside experiences.

WCMP support is giving new life to coastal community waterfronts as deteriorated downtowns and industrial sites are refurbished as parks, lake walks, marinas and more. As a bonus, the renovations curb polluted runoff, clean up contaminated sites and slow erosion.

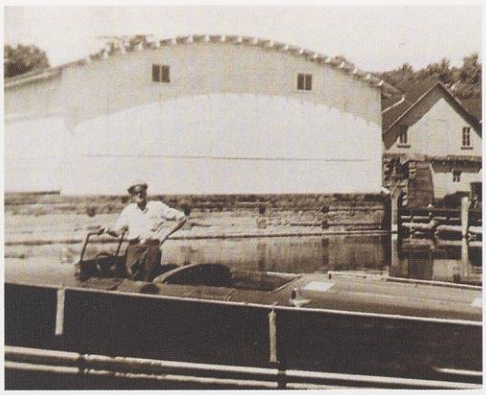
Some communities want to preserve what they have and others want to rediscover their coastal assets.

The Wisconsin Harbor Towns Association is one partner that sees a future in boosting local economies by making waterfronts centers for quality recreation and tourism. These include making lighthouses, cruise ships, docking areas, diving attractions and more attractive for visitors, restaurants and shops. Of the $10 billion that tourists spend in Wisconsin each year, more than $4 billion is spent in coastal communities, according to the Wisconsin Department of Tourism.

For the City of Bayfield, WCMP funding opened the door to waterfront dances, weddings and many happy memories. From 1995 to 1997 the city renovated a pavilion that it had owned since 1930. Such classic crooners as Louis Armstrong and big

OSCAR HERRERA

Trees line the streets of Two Rivers, a city that's surrounded on three sides by Lake Michigan. A walkway and benches provide access to the shoreline for residents and visitors.



BAYFIELD HERITAGE ASSOCIATION, INC.

CITY OF BAYFIELD FILE PHOTO

The Bayfield Lakeside Pavilion with a boater in the foreground in 1940. *(right)* The pavilion, a multi-purpose and multi-seasonal facility, as it looks today.

band leaders like Tommy Dorsey played there. Originally designed as a roller rink and summer dance hall, the pavilion was uninsulated.

"We wanted to turn it into a year-round community center and WCMP funding was a linchpin that made it happen," says Larry MacDonald, Bayfield mayor and WCMP council member. Funding will also help complete a waterfront plan.

Sheldon Johnson, deputy director of the North West Regional Planning Commission (NWRPC), also lauds WCMP's help with a new conference focusing on Lake Superior's past and future. One issue will be identifying zoning limits on areas prone to erosion. "The last thing anyone wants to do is put a house up on a beautiful overlook and find out five years later that they only have 20 feet left."

Exotics threaten the Great Lakes

DNR FILE PHOTO

Zebra mussels continue to be a major concern in the Great Lakes and inland waters. They are one of more than 160 exotic species found in the Great Lakes.

Last spring, scientists met in Chicago to talk about halting the spread of exotic species. More than 160 non-native species in the Great Lakes are responsible for $137 billion a year in economic losses nationwide.

WCMP was behind a movement to create a 2001 Governor's Task Force on Invasive Species that WCMP chief Dea Larsen Converse participated in. One year later, they recommended a statewide invasive species program to the governor. Rules that took effect in Wisconsin last year prohibit launching a boat or other boating equipment in navigable waters if aquatic plants or zebra mussels are attached. The DNR received funding to start a watercraft inspection program and a campaign to educate boaters on properly cleaning boats.

This year, DNR received a WCMP grant for outreach on exotics.

Some communities ask WCMP to fund local programs to motivate people to take action against invasives. Jaime Corbisier, conservationist for the Door County Soil and Water Conservation Department, developed a model to teach about and rapidly react to invasive species outbreaks.

"We have 250 miles of coastline and the most threatened or endangered species in Wisconsin," Corbisier says. A WCMP grant helped fund a consultant to get the county organized and develop a steering committee. The Door County Soil and Water Conservation Department supports a countywide invasive species team. Now each township has a coordinator. Brochures help people identify exotics and a mapping system captures the information. A website is hosted through University of Wisconsin Extension (www.clean-water.uwex.edu/lakeshore/dcist/).

"Now we have early detection and monitoring," Corbisier says. "WCMP provided us with funding, but what you can't put a price on is the intrinsic value of the natural beauty that pulls a lot of tourism here."

Shoring up history

From lighthouses to shipwrecks, WCMP preserves coastal sites.

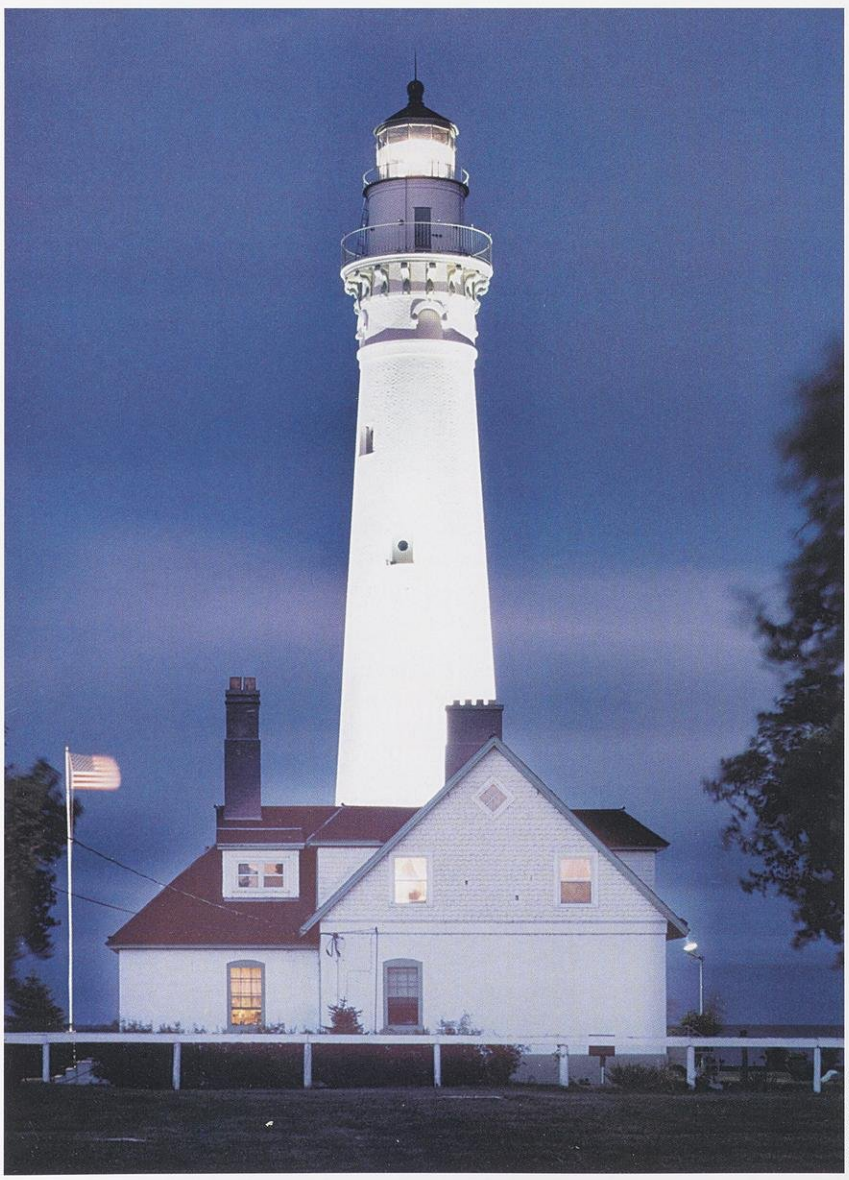
"It's a symbol of the Racine area," explains John Schmit: a big, tall beacon and the pride of this little village of 1,900. Schmit, village deputy clerk, is talking about the Wind Point Lighthouse, 108 feet high and one of the oldest lighthouses still open for visits on the Lake Michigan coast. As co-founder of the Friends of Wind Point Lighthouse, Schmit says, "this is our big contribution to the community."

The lighthouse was built in 1880 and is still operated by the U.S. Coast Guard. The tower is attached to a keepers dwelling. Since 1964, the village has used one of the keepers dwellings for meetings. Designated as a National Historic Site in 1984, the property was turned over to the village 15 years later providing they maintain it as a park open to the public. The shoreline at that time was very ragged and high water levels in the 1980s left the property badly eroded. A $20,000 grant from WCMP helped shore it up.

"We put in very heavy boulders along the shore to bolster it and make sure that we didn't lose land or a building, and we built a garden," Schmit says. A second grant financed building a public restroom.

The tower and lantern room were off limits until three years ago. Now the friends group offers tours three times a year when visitors can climb the 144 cast iron steps that spiral to the top. "We've made the property much more accessible and even rent out the grounds for weddings," Schmit says. "We wanted to improve public access to the lakefront and lighthouse, but also preserve it and make it beautiful and safe."

The lighthouse at Wind Point is the pride of the community. The lighthouse is still operating and the Friends of the Wind Point Lighthouse offer periodic tours to the tower and lantern room.



ARMIN CLOBES

WCMP also throws a lifeline to those who didn't heed the beacon's warning.

"We are celebrating our first year of projects with WCMP funding," explains Russ Green, underwater archaeologist for the Wisconsin Historical Society. Its Wisconsin Maritime Trails program fosters appreciation for the days when schooners and steamers plied the Great Lakes. The trails mark and preserve shipwreck sites for divers and non-divers alike. More than 700 ships sank in and around Wisconsin's Great Lakes waters.

Mooring buoys on shipwrecks encourage safe diving by delineating where divers can safely anchor and start exploring without damaging the wreck site. WHS also surveys and documents the sunken ships. Online visitors to www.maritimetrails.org can learn about wrecks, plan a tour, scan photos and read journal entries posted by underwater archaeologists.

Archaeologists recently surveyed the schooner *Lumberman*, the massive wooden steamer *Appomattox* located off Atwater Beach at Shorewood north of Milwaukee and the schooner *Kate Kelly*, which ran aground on Racine Reef during a severe gale in 1895.

"We are using WCMP funding to do public interpretation work on the *Appomattox* because it is so close to shore," Green says. "Signage will go on the bluff at Atwater Beach so that visitors there can learn more." Funding for informational kiosks at the Wisconsin Maritime Museum in Manitowoc and at the Society's headquarters in Madison will also share details of the state's briny maritime history.

Coastal hazards

When bluffs fall and sand gets you stuck.

As you drive County LS in Sheboygan County you can't miss the signs of danger. The highway north of the Whistling Straits Golf Course in Kohler is in jeopardy of falling into the lake. Officials are trying to decide if filling and riprap will be enough to save the bluff or if the road should be moved, explains Mike Friis.

Managing natural hazards, such as bluffs that can give way, has been a backbone of the WCMP and a priority since it was created.

Work from 1974–79 led to a model ordinance to regulate coastal development. It was used in Racine, Ozaukee, Sheboygan and Douglas counties. Yet, there is no official state policy to deal with coastal erosion in the Great Lakes. High lake levels in the mid-1980s caught many unprepared. This led WCMP to update methodologies to better understand shore erosion and develop appropriate policies. For about 10 years, WCMP has organized and staffed an interagency natural hazards work group including members from the Wisconsin Department of Natural Resources, Wisconsin Emergency Management, the State Cartographer's Office, and UW Sea Grant.

"The key is to align the talent and resources in the state to address shore erosion taking into account the point of view of property owners," says Alberto Vargas, WCMP natural hazards coordinator who chairs the work group.

Shore erosion can average two to five feet per year in bluff areas; 10 feet per year was recorded in portions of Racine and Kenosha counties. Varying lake levels cause concerns. High water levels can add to erosion and flooding. Low levels leave piers high and dry and cause navigation concerns.

Current coastal hazard work focuses on education, assessing if existing ordinances are effective and developing statewide shore erosion plans. We need to include coastal hazard planning into state and local mitigation plans to break the cycle of disaster-recovery-disaster, explains Diane Kleiboer, from Wisconsin Emergency Management and a work group member.

"There are a lot of homes on Lake Michigan that are too close to the edge, so there is a lot of interest in putting in shoreland protection structures," says Al Lulloff of DNR's watershed management bureau and also a work group member.

Others, such as David Hart, GIS specialist at the UW Sea Grant Institute, have been developing applications and conducting GIS training in all coastal counties.

Phil Keillor, a semi-retired coastal engineering specialist for UW Sea Grant, has worked on coastal hazards with WCMP since it started. In the late 1970s he led studies for Racine County to manage the shore and identify scenic areas. The Coast Watch Program trained volunteers to make observations about pollution and erosion.

DNR PHOTO — PLYMOUTH

Erosion is eating away at the bluff along County LS in Sheboygan County and officials are looking into options for trying to save the bluff or rerouting the highway.

"Racine's new shoreland ordinance in the 1980s was intended to protect new homes," he says. "We adopted and modified a model ordinance that WCMP has adapted." He helped sell the concept to other counties.

Studying coastal erosion led scientists to address other coastal issues. In the early 1980s, Keillor was involved in a project with the Department of Natural Resources to map historic lake trout spawning reefs in Lake Michigan and Lake Superior. "This was an unusual project for WCMP because it took us off shore," Keillor says.

They mapped the Apostle Islands and Devil's Island Shoal. Keillor credits Bruce Swanson of the DNR with coming up with the idea of packing fertilized fish eggs in reefs of sandwiched Astroturf. The U.S. Fish and Wildlife Service helped stock reefs for more than 12 years until enough lake trout came back and spawned.

"It was a successful restoration project," Keillor says. "It's remarkable that an agency and the people in it would have the faith to keep the project running that long."

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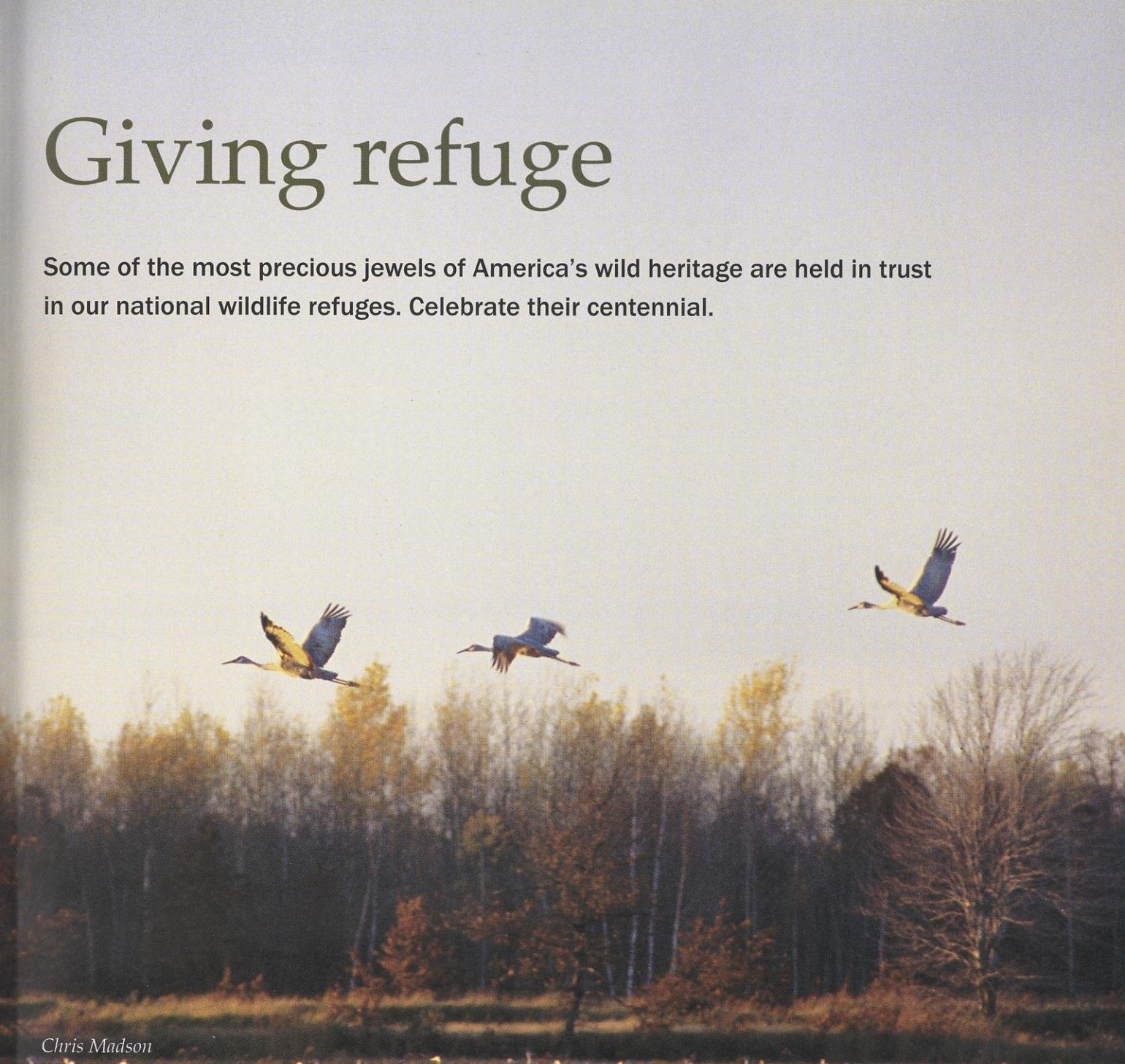
http://coastal.wisconsin.gov

WISCONSIN COASTAL MANAGEMENT PROGRAM

NOAA

Giving refuge

Some of the most precious jewels of America's wild heritage are held in trust in our national wildlife refuges. Celebrate their centennial.



Chris Madson

For almost as long as there have been kings, there have been preserves set aside to provide game for sport. A thousand years B.C., Assyrian rulers were keeping "parks" where game animals were fed and sometimes stocked for the pleasure of the ruler. A Roman hunter wrote of "reserved places" in Macedonia "full of amenities for the preservation of game." In 812 A.D., the emperor Charlemagne ordered that "our woods and forest be well kept." He directed his estate steward "to preserve well our beasts of chase in the forests, and to protect hawks' nests."

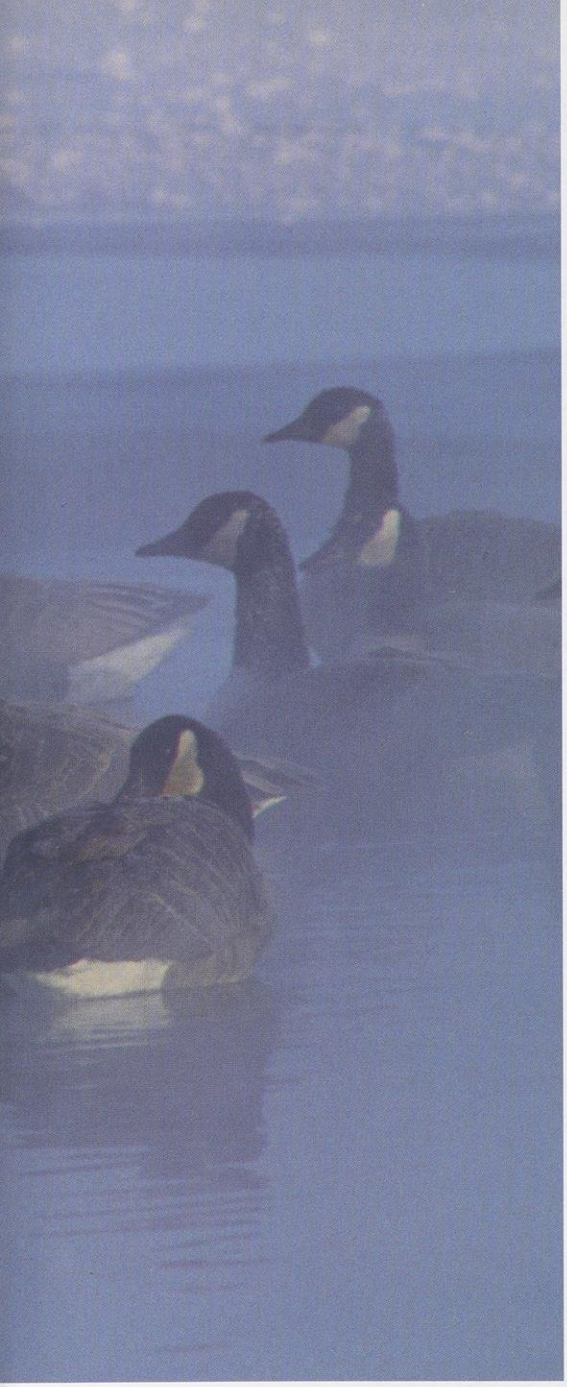
Parts of England's Magna Carta controlled the use of the king's forests, including game animals and raptors. The rules were published in 1225 as the Charter of the Forest, an outline of hunting regulations and land management rules for this far-flung hunting preserve and refuge.

The eight national refuges in Wisconsin include complexes of wetlands, upland forests, grasslands and coastal properties. Federal fish hatcheries, wetland management districts and field offices are also housed here.

U.S. FISH AND WILDLIFE SERVICE, LA CROSSE DISTRICT

(left) The Upper Mississippi River National Wildlife and Fish Refuge comprises 233,000 acres of bluffs, islands, floodplain marshes, bottomland forests and prairies. It stretches 261 river miles along portions of the Mississippi in Minnesota, Wisconsin, Iowa and Illinois.
(above) The refuge system from the Canadian border to the southern coast provides breeding grounds, nesting sites and resting areas for both resident and migratory species.
(right) Ann Prochowicz and Jennifer Lilla band wood ducks at Trempealeau National Wildlife Refuge.

In 1275, the Italian Marco Polo found his way to the court of Kublai Khan in China. Kublai was an ardent hunter who kept many game preserves. "The Khan has a great palace," Polo later wrote, "which he is fond of visiting, be-



HERBERT LANGE ♦ TREMPEALEAU NATIONAL WILDLIFE REFUGE

cause it is surrounded with pieces of water and streams, which are the haunt of many swans. There is also a fine plain, where are found in great numbers, cranes, pheasants, partridges, and other birds. He derives the highest degree of amusement from sporting with gerfalcons and hawks, the game being here in vast abundance."

By this time, the Chinese had already begun a system of wildlife management. "Near to this city," Polo continued, "is a valley frequented by great numbers of partridges and quails, for whose food the Great Khan causes millet and other grains suitable to such birds, to be sown along the sides of it every season, and gives strict command that no person shall dare to reap the seed; in order that the birds may not be in want of nourishment."

So the concept was at least 2,500 years old by the time it crossed the Atlantic with English settlers. The history books that treat the winning of the New World spend little time on hunting as a cultural phenomenon, but it's fairly clear that many of the newcomers from Europe found hunting to be one of America's great new freedoms. After centuries of being denied access to the king's forest, new Americans reveled in the abundance and proximity of game.

This enthusiasm was soon reflected in local shortages of wildlife. In 1646, the town of Portsmouth, Rhode Island established a closed season in response to a decline in deer numbers. By 1672, at least one observer reported that flocks of passenger pigeons in New England were "much diminished" from the numbers he had seen 50 years earlier.

In all too many cases, the sudden freedom to exploit natural resources leads to exhaustion of those resources. As the colonies prospered and won their independence, there were signs that American wildlife faced that fate.

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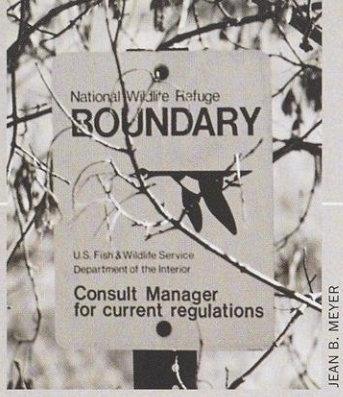
The blue goose in Badgerland

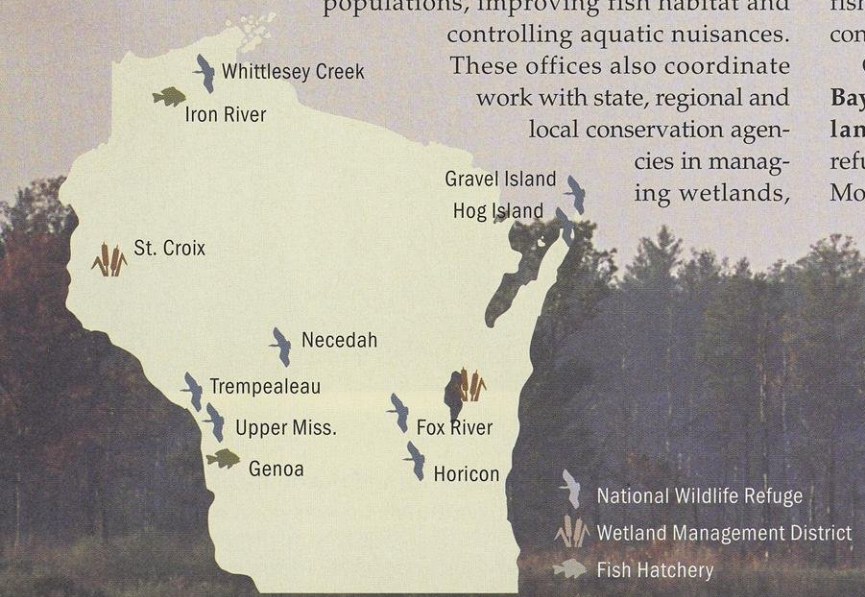


JEAN B. MEYER

The national refuge system, symbolized with markers showing a stylized Canada goose, is an active partner in providing Wisconsin's mix of outdoor recreation for people as well as resting areas and breeding grounds for fish and wildlife. Most people know the Horicon National Wildlife Refuge, but in fact, the U.S. Fish and Wildlife Service manages eight wildlife refuges, two fish hatcheries, two wetland management districts and nine other field offices in Wisconsin.

From north to south, the **Whittlesey Creek National Refuge**, three miles west of Ashland is a coastal wetland at the head of Chequamegon Bay. Established just four years ago, 97 acres of an envisioned 540-acre parcel protects shallow coastal lands, springs and wetlands that provide spawning grounds for salmon and the anadromous strain of brook trout called "coaster" trout. Migratory waterfowl, shorebirds and neotropical songbirds rest here on their transcontinental journeys. So should you! The refuge office in the Northern Great Lakes Visitors Center provides a relaxing spot to learn about the region, see displays about local wildlife, and read about the geological forces that shaped this rugged area.

Fisheries resource offices in Ashland, Green Bay and La Crosse provide services to tribal governments, national parks, refuges and forests in restoring native fish populations, improving fish habitat and controlling aquatic nuisances. These offices also coordinate work with state, regional and local conservation agencies in managing wetlands, waterway projects and shoreland improvements that enhance habitat for fish and wildlife.



The **Iron River National Fish Hatchery** between Ashland and Superior raises lake trout and brook trout eggs, fingerlings and broodstock to bolster fish populations in Lake Superior, tribal waters and regional stocking.

The **St. Croix Wetland Management District** just west of New Richmond, not far from the Twin Cities, manages 7,500 acres of wetlands and grasslands on more than 40 properties in western Wisconsin. This eight-county area holds breeding grounds and resting areas that are widely used by resident and migratory waterfowl that move from the potholes of western Canada and the plains on their journeys.

A cluster of three offices just east of Green Bay in New Franken provide **ecological services, fisheries resources and law enforcement** aid on Lake Michigan, tribal waters and national properties along the coasts in eastern Wisconsin, western Michigan, Illinois and Indiana. The offices enforce national wildlife trade laws, species protection laws, take part in coastal recovery projects, research alternatives to commercial fishing gear, survey fish populations and help test for lake contaminants, among other duties.

Gravel Island National Wildlife Refuge and the Green Bay National Wildlife Refuge (also called the Wisconsin Islands Wilderness Area) constitute the smallest federal refuges in the state. They are just off the tip of Door County. Most of the vegetation on Gravel Island, just four acres and on

Spider Island, 23 acres, has been lost to wind and wave action. Remaining downed trees form habitat for a few dabbling ducks, gulls and cormorants. The Green Bay National Wildlife Refuge consists of the two-acre Hog Island just east of Washington Island. It was set aside as a bird nesting colony in 1913. A few colonies of red-breasted mergansers, double-crested cormorants and herring gulls nest here. None of these small, remote properties is developed or has improved landings. Consequently, public visits are discouraged.

Necedah National Wildlife Refuge in Wood and Juneau counties forms a sprawling 43,600-acre mix of wetlands, uplands, bottomland forests and grasslands. The refuge boasts more than 230 species of birds including rare grassland, wetland and forest species. An international project is trying to establish a breeding population of whooping cranes that will migrate from Necedah to Florida. Other rare species on the road to recovery here include Karner blue butterflies, the massasauga rattlesnake and bald eagles.

The thousand-acre **Fox River National Wildlife Refuge** is managed in concert with the 21,417-acre federal **Horicon National Wildlife Refuge**. The Department of Natural Resources manages an adjoining southern state portion of the Horicon Refuge. These refuges provide sanctuary, breeding ground and outdoor recreation. The Horicon area is the world's largest freshwater cattail marsh. It provides a fueling, feeding and resting area for more than a million migrating Canada geese each year. Rookeries and other nesting areas host thousands of ducks, herons, shorebirds and smaller populations of sandhill cranes.

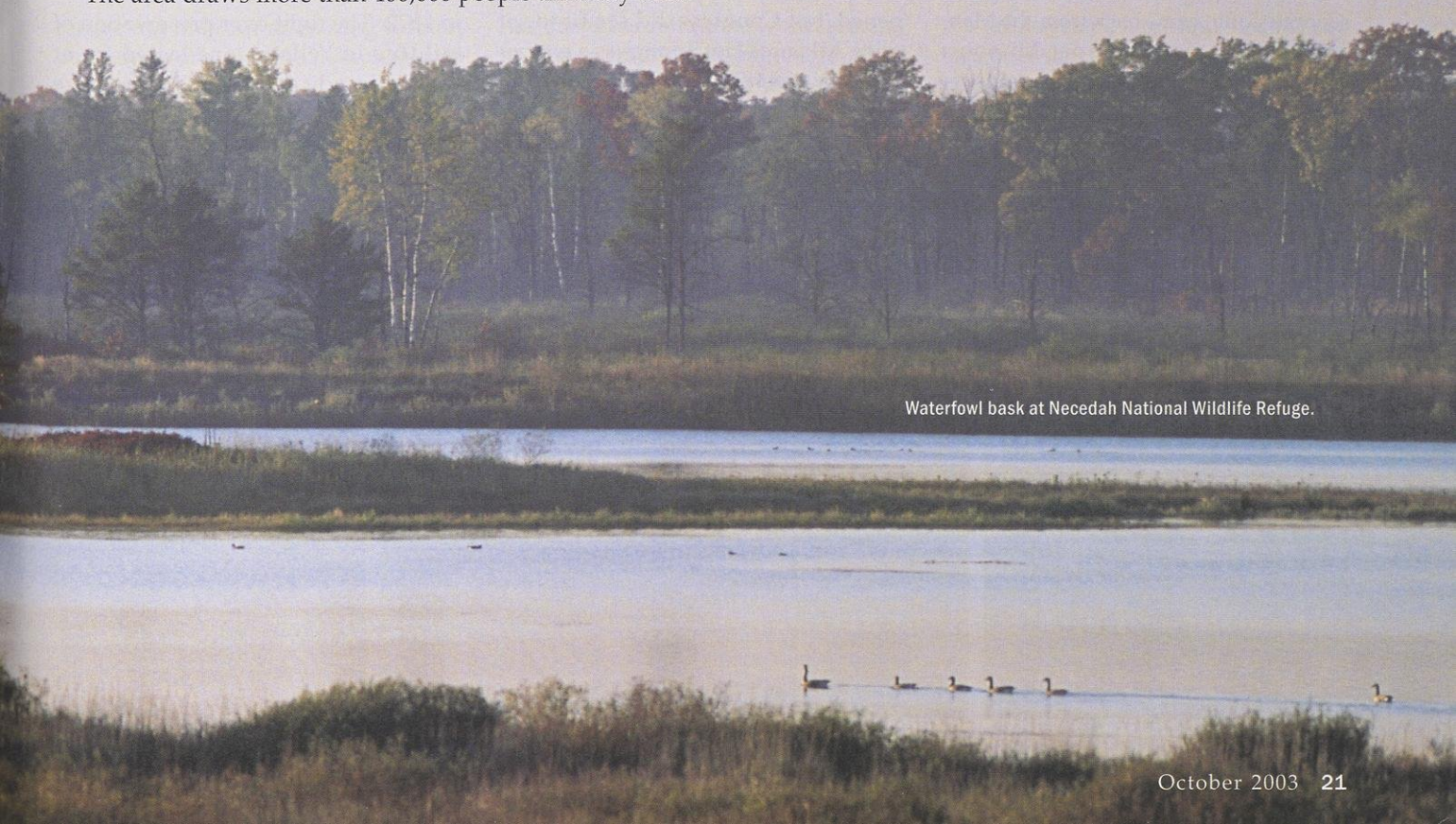
The area draws more than 400,000 people annually who marvel at the sights and sounds of so many waterfowl. The surrounding wetlands and fields also provide excellent hunting opportunities in season.

The **Leopold Wetland Management District** with headquarters in Mayville, east of Waupun, manages 48 waterfowl production areas in 16 counties of southeastern Wisconsin. The specialty here is preserving critical habitat for migrating waterfowl and songbirds.

The **Trempealeau National Wildlife Refuge** in the Mississippi River Valley of western Wisconsin includes roughly 6,200 acres of sand prairies and marshes that are used by migrating shorebirds, waterfowl and a host of other species. The habitat here is prime for nesting bald eagles, osprey, black terns and pelicans.

A complex of refuges, a fish health office (La Crosse), and law enforcement staff work with state officials in Wisconsin, Minnesota, Iowa and Illinois. The whole **Upper Mississippi National Wildlife and Fish Refuge** covering almost a quarter million acres stretches over 261 river miles from Winona, MN south to Rock Island, IL. Along the wide, shallow and meandering Mississippi River floodplain marshes, islands, channels, bottomland forests, sand prairies and bluffs mingle and flow. More than 134 fish species find refuge here. The area hosts 16 major heron colonies and more than 120 bald eagles. Some portions of the backwaters are closed areas without roads or much development. By contrast, other parts of the river are highly traveled by barge traffic, commercial fishers, sport anglers, skiers, canoeists and campers.

— from U.S. Fish and Wildlife Service fact sheets



Waterfowl bask at Necedah National Wildlife Refuge.

continued from page 19

A certain kind of citizen was convinced that he had a right to take all the land had to give wherever he found it. That view led to the extinction of the eastern bison and elk; the great auk and Carolina parakeet; the Labrador duck and heath hen.

However, from the beginning, there were people who saw the land in a different light. They took a new approach to the concept of the king's deer. In their view, the king held English game and game refuges in trust for the people. They argued that, in the new nation, the people stood in place of the king. When it came to the future of wildlife in the republic, that meant the people as a group had a right "and a responsibility" to protect game just as the nobility had protected it in the Old World.

The impulse to create wildlife refuges in America took some time to emerge, but as the nineteenth century dawned, a few visionaries began to recognize that hunting regulations by themselves weren't going to be enough to save the continent's wildlife heritage. In 1832, artist George Catlin came back from the Mandan villages on the upper Missouri River with a suggestion for his countrymen: "A nation's park, containing man and beast in all the wild and freshness of their nature's beauty!"

JACK BARTHOLMAI

Horicon is more famous for its waterfowl populations, but the Halloween pennant dragonfly *(Celithemis eponina)* is equally at home here.

Catlin's prairie park never happened, but Congress did see fit to set aside Arkansas Hot Springs as a national reserve in 1832. In 1864, the federal government granted the Yosemite valley to the state of California "for public use, resort and recreation." Yellowstone, the nation's first park, followed in 1872. The fight over preservation of wildlife in Yellowstone lasted for at least a decade and helped crystallize American opinion on wildlife conservation. In 1892, President Benjamin Harrison set aside the Afognak Forest and Fish Culture Reserve in the Aleutians, a

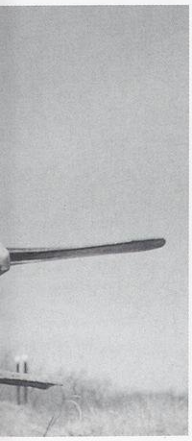
Sharing an enthusiasm for wildlife with visitors. *(left to right)* **Catching trout on National Fishing Day near La Crosse, tracking paddlefish with radio telemetry on a cold spring day, getting volunteer help with the paddlefish research in La Crosse.**

ROBERT QUEEN

Sandhill cranes at Necedah National Wildlife Refuge. Whooping cranes have also been introduced here in hopes of reestablishing a migrating flock from Wisconsin south to Florida.

refuge not only for spawning salmon but for a host of marine mammals and sea birds.

But the official beginning of the nation's wildlife refuge system was March 14, 1903, when Theodore Roosevelt set aside a small island near Sebastian, Florida, as a federal bird reservation. Pelican Island supported thousands of nesting water birds, including herons, egrets and roseate spoonbills that were being slaughtered across America to provide plumes for ladies' hats. Before he left office, Roosevelt used his authority to create refuges in Florida, Oklahoma, Nebraska, Montana and Oregon.



U.S. FISH AND WILDLIFE SERVICE, LA CROSSE DISTRICT

The history of America's wildlife refuges has one other milestone worth remembering. In the 1920s, Congress fought a long-running battle over the concept of federal waterfowl refuges. The debate pitted hunters against preservationists, and the confrontation might have scuttled the entire idea if it hadn't been for two almost-forgotten Congressmen. Senator Peter Norbeck of South Dakota and Congressman August Andresen of Minnesota sponsored the bill that finally authorized a system of waterfowl refuges in 1929. The Norbeck-Andresen Migratory Bird Conservation Law provided a foundation for the modern refuge system.

Today, there are 95 million acres in the national wildlife refuge system, providing habitat for species as rare as the whooping crane and black-footed ferret, as common as the mallard. From the Gulf of Mexico to the north slope of Alaska, the refuges offer crucial way stations on the great migrations for all the far travelers, large and small. They also offer sanctuaries for people, a combination of spectacle and quiet that allows us to recharge, re-create.

And so we celebrate the 100th anniversary of an impulse that is 3,000 years old — the urge to hold onto something wild. It's an old idea. But a very good one.

Outdoor essayist Chris Madson edits Wyoming Wildlife *for the Wyoming Game and Fish Department. Reprinted with permission.*

Life on the edge

The view is magnificent, the recreation unmatched, but waterfront homeowners find some special requirements of lakeside living hard to live with. Can we help while protecting the waterways?

Carmen Wagner

Chip Nielsen grew up on Big Portage Lake in Vilas County and he knew that someday he would want to offer his children and wife the opportunity to settle in lake country. In 1990, Nielsen started to realize that dream when he found a home on Muskellunge Lake in Vilas County. The house had been built in the 1940s on a large lot of more than six acres and over 350 feet of sandy frontage for the family to enjoy.

The Nielsens lived there for more than 10 years, but eventually their home needed some improvements, and that's when they found even bigger problems. Nielsen's home was considered "nonconforming." It was located only 42 feet from the ordinary high water mark of Muskellunge Lake, and statewide standards required that all structures be set back at least 75 feet from the shore. The Nielsens faced three options — remodel the existing home, move it back from the water's edge or build a new house a little farther away from the water. Further, if the Nielsens chose to remodel the residence, any repairs, alterations or additions would be limited to 50 percent of the assessed value of the home. Since the house was not in the best shape, the assessment was low and did not permit the desired improvements within the 50 percent cap.

CARMEN WAGNER

Nielsen could have moved the existing house back to 75 feet, but that option would have blocked access to his garage. The final option of building a new house would have resulted in losing a beautiful grove of white pines and that was simply not an option in his mind.

The Nielsens decided to sell the property to someone who could live with the property restrictions while they searched for a new lakeshore home. He put his dream home up for sale and eventually found another property on Harmony Lake in Vilas County. He admits that he still misses the many friendships his family had nurtured along the sandy shores of Muskellunge Lake.

Today Chip Nielsen is a member of the Vilas County Planning and Zoning Committee and is working with an advisory committee to help the Department of Natural Resources review the state standards for shoreland development. He hopes to help other families avoid the tough decisions his family had to make, or at least provide more options.

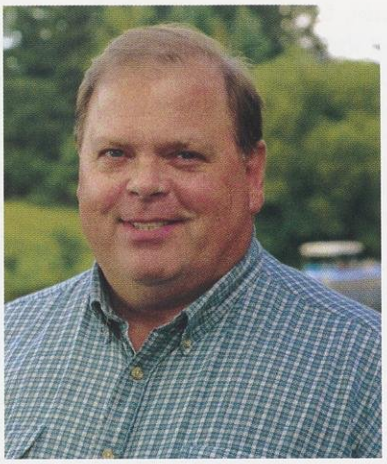
The most significant issue this committee will face is dealing with people who own older lakeside homes that don't meet changing building codes, Nielsen said. The number of so-called "nonconforming structures" — homes, sheds and other outbuildings — is a tremendous problem on many lakes. And it is extremely frustrating for homeowners who are caught between protecting their property and wanting to take care of their lake, he said. Nielsen is encouraged that his work on the DNR advisory committee is helping steer the DNR managers and zoning administrators in new directions when regulating nonconforming structures, as well as handling other zoning issues.

Landscapers have a lot of ideas for planting mixes of natural vegetation that protect the shore, screen shoreland development and create attractive settings.
(below) **Restoring shoreland cover would probably prevent this erosion into Lake Redstone.**

CARMEN WAGNER

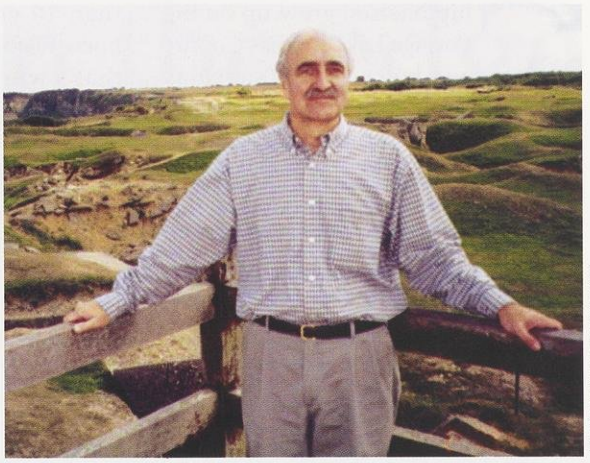
Chuck Mitchell, another advisory committee member, shares Nielsen's hope that the committee will develop a set of recommendations that will help waterfront owners be good stewards of Wisconsin's lakes and rivers. Mitchell lives in southern Wisconsin and has a second home on Long Lake, part of the Eagle River area chain of lakes.

"While people, including me, are drawn to the beauty of shorelands, there seems to be a lack of understanding of how we impact those shorelands," Mitchell said. "I think we need to keep in mind that not everyone instinctively knows how to accommodate development while protecting sensitive shoreland areas."



COURTESY OF VILAS COUNTY NEWS-REVIEW

Shoreland homeowners get caught between protecting the value of their property and wanting to take care of their lake. — Chip Nielsen



COURTESY OF HM GRAPHICS

Shoreland rules need to provide understandable guidance. Not everyone instinctively knows how to accommodate development while protecting sensitive areas. — Chuck Mitchell

Mitchell's concerns about how development changes shorelands are echoed in many research findings. Building homes and businesses along a lake or a stretch of river changes both the land and the water. On land when native plants and trees are removed to make room for construction, the vegetation is often replaced with hard surfaces like roads, driveways and roofs. These impervious surfaces don't allow rain and snow melt to soak into ground. Water quickly runs off into adjacent lakes and rivers, carrying pollutants that harder surfaces can't filter. Studies (many of them completed in Wisconsin) found that when as little as 10 to 15 percent of the land around a lake or river is paved or covered, water quality, aquatic habitat and aquatic species diversity decline rapidly.

Development brings other changes too. Visual beauty and the aesthetic qualities draw people to the lakeshore who seek quiet, open space, solitude

Developing shorelines in unincorporated areas

JOHN HAGENGRUBER

Every lakeshore owner wants a nice view of the water, but lakes and rivers also need protection to provide habitat for "residents" like mammals, insects and fish.

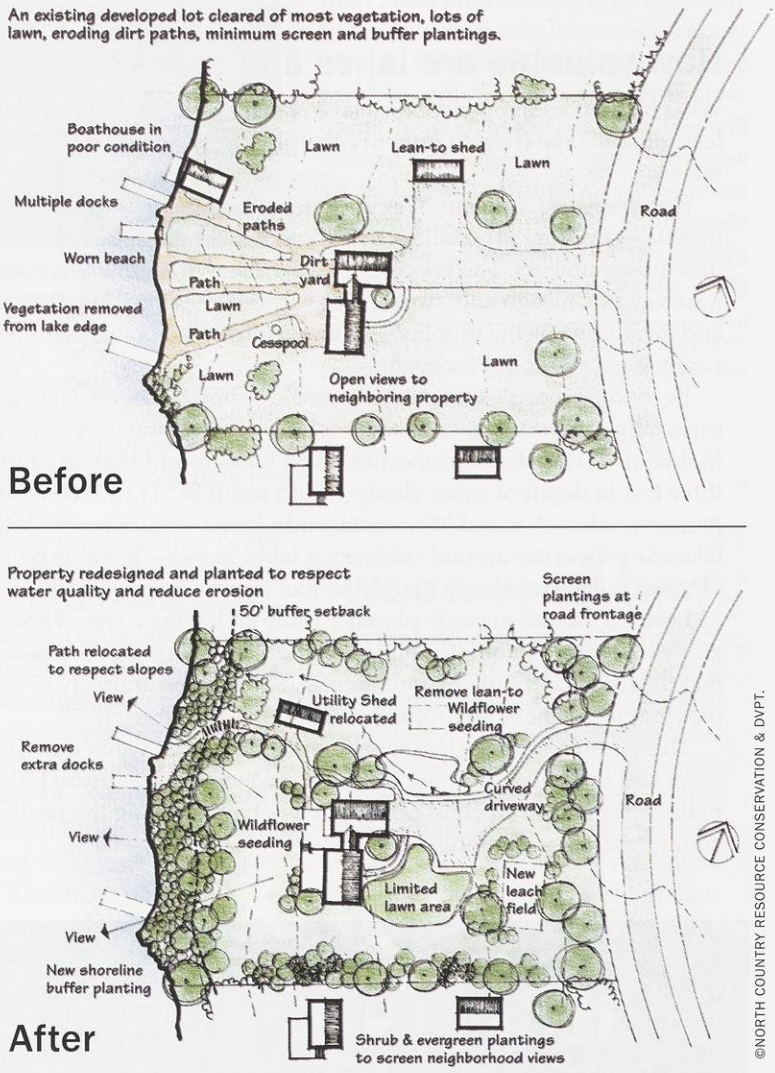
Wisconsin law (Section 59.692, Wisconsin Statutes) requires counties to adopt and enforce zoning ordinances that meet or exceed the following minimum standards in unincorporated areas:

- Lots served by public sanitary sewers must have a minimum average width of 65 feet and a minimum area of 10,000 square feet. Lots with a septic system must have a minimum average width of 100 feet and a minimum area of 20,000 square feet to ensure adequate separation of water wells from septic drainfields and adequate wastewater treatment in varying soils.
- All buildings and structures, except piers, boat hoists and boathouses, must be set back 75 feet from the ordinary high water mark. If an existing pattern of development exists, counties may allow lesser setbacks. Setbacks create visual buffers, protect structures from flooding, provide space for land to filter and slow runoff, and can provide space for animals and plants that thrive in the near-shore area.
- Buildings and other structures that predate the adoption of shoreland zoning ordinances and do not meet the standards found in those ordinances are considered "nonconforming structures." The county may prohibit the alteration, addition or repair of such a structure if the cost of the alteration, addition, or repair over the life of the structure exceeds half of the equalized assessed value of the structure.
- Clear-cutting trees and shrubbery is prohibited within 35 feet of the ordinary high water mark except for one 30-foot corridor in any 100 feet of frontage to provide views of the water and access to the water's edge. The regulation also aims to protect shoreland vegetation and the wildlife habitat it offers.

Improving shoreland regulations

Statewide standards for managing shorelands are only 37 years old, so why change them now? Three main goals for the rewrite include:

1. **Recommending standards that provide better shoreland protection.** Research during the last 20 years has shown a disturbing trend. As more people want to develop more shoreland, current minimum standards are not adequate to protect clean water, provide wildlife habitat or preserve natural scenic beauty. The DNR hopes new standards can be developed to maintain the integrity of Wisconsin's lakes and rivers.
2. **Providing greater clarity in the standards.** Many terms in the current standards are ambiguous or unclear. By providing clearer definitions and standards, it should be easier for the counties to administer the standards, easier to gauge if standards are being consistently applied across the state, and easier for the public to understand the requirements.
3. **Offering more flexibility while enhancing environmental protection.** The current standards do not provide flexibility to develop in certain unique circumstances. The program does not allow local innovation as communities develop shoreland zoning ordinances suited to local conditions and needs. By offering property owners the option to offset the environmental consequences of proposed changes and by providing counties with incentives to protect waterways, the Department of Natural Resources hopes to provide more options to the public, while providing more protection for Wisconsin's lakes, rivers and streams.



This depicts a vision for ways to improve a shoreland lot so the home is lighter on the land and less intrusive for neighbors and water users. It incorporates many features that the proposed shoreland regulations try to include to provide more flexibility to property owners.

When skillfully done, shoreland vegetation naturally screens homes so they are largely invisible from the water and the buffers better protect water quality while providing wildlife habitat.

CARMEN WAGNER

and a place to experience nature in a more natural setting. As more development is allowed or as established homes expand, many of Wisconsin's lakeshores and riverbanks start to resemble suburban neighborhoods rather than sustaining the feel of "up north" cabins and cottages.

Development patterns also affect the nonhuman neighbors. Research documents that constructing one house can change wildlife habits up to 1,500 feet away as animals alter their travel patterns or young become more susceptible to predation. Where many houses are built, these impacts are magnified.

For example, one study measured calls from green frogs as an indicator of aquatic health along northern Wisconsin waters. Green frogs are shoreline-dependent and are common along lakes, ponds and streams. The study found that green frog populations decline as more homes are built along the shoreline and disappear altogether when the housing density reaches approximately 30 homes per mile or about a home for every 175 feet of shoreline. Existing zoning standards allow over 50 homes

How valuable are lakes and rivers?

What price would you place on a lake or river? Many would say they are priceless, others have tried to quantify the physical and intrinsic values of public waters.

One measure? Tourism. Wisconsin travelers spent an estimated $11.7 billion in 2002 — up from $11.4 billion in 2001 and water-related activities play heavily into those numbers. The Wisconsin Department of Tourism recently completed a survey of Chicago and Twin Cities vacationers who ranked boating, fishing and swimming as the number 1, 2, and 3 most memorable activities from their summer vacations in Wisconsin.

Beyond the people who visit Wisconsin's shorelands, the lakes and rivers are especially important to the people who live along them. A five-year study in Maine of 900 lakefront properties on 34 lakes found that an improvement of three feet in depth of water clarity would result in $11 to $200 more per foot of property value. A recent Minnesota study found similar results estimating that lakeside properties around recovering lakes increase in value by tens of thousands of dollars or more with a three-foot improvement in water clarity.

Lastly, a Canadian study placed a value on having a river view. Using property values and rental information in the City of Saskatoon, researchers found that the river contributed approximately $1.2 million annually to the city by improving the aesthetic environment within the city limits.

These four examples just touch on the economic value that quality waterways add to local economies. They put a concrete measure on intangible experiences like helping a child catch a first fish or enjoying the northern lights at your grandparents' cabin.

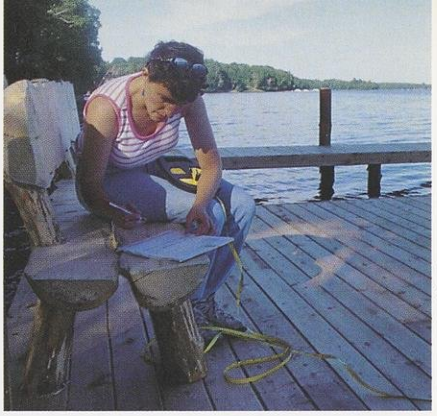
ROBERT KORTH

On lakes that are heavily used where few shoreland protections are practiced, the waterfront feels more congested, less relaxing and less appealing. Such areas are also more prone to pollution problems and provide less fish habitat.

per mile of shoreline in unsewered areas and over 80 homes per mile in sewered areas.

Mounting evidence that current shoreland development standards were inadequate to protect water quality, wildlife habitat and scenic beauty led the Department of Natural Resources to work with Nielsen, Mitchell and others on an advisory committee to review Wisconsin's shoreland regulations.

Since 1966 Wisconsin's Shoreland Management Program has aimed to "further the maintenance of safe and healthful conditions; prevent and control water pollution; protect spawning grounds, fish and wildlife habitat; control building sites, placement of structures and land uses and reserve shore cover and natural beauty." The program



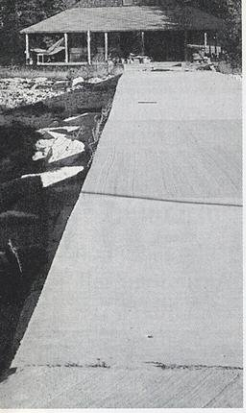
KATHERINE ESPOSITO

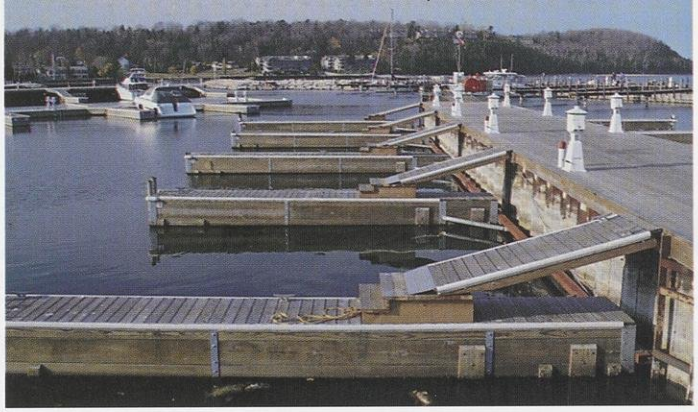
Both DNR and county zoning inspectors examine shoreland projects to achieve a balance between landowners rights and the public rights to the water's edge.

set statewide standards for how shorelands could develop in unincorporated areas. Counties were then required to adopt, administer and enforce these minimum standards or adopt more protective standards.

Those codes and regulations have their foundation in much older water law, the Public Trust Doctrine as incorporated in the Northwest Ordinance of 1787, interpreted in Wisconsin Territorial Law of 1836 and embodied in the State Constitution of 1848. Those unique laws stated that the navigable waters flowing into the Mississippi River, St. Lawrence River and all the carrying waters between would remain "common highways and forever free." In Wisconsin, more than 150 years of case law have interpreted the Public Trust Doctrine to define our collective rights to shared water resources. Those cases often heat up as our beliefs about equality and citizenship rub against our defense of private property, self-determination and free enterprise about water use and shoreline access.

The current advisory committee mirrors those myriad interests in public water. Its 28 members represent waterfront property owners like Mitchell and Nielsen, realtors, homebuilders, conservation groups and lake associations. "We've tried to get a broad view geographically and a broad range of interests to help us balance public and private rights," says Al Shea, who directs the DNR Bureau of Watershed Management. "We wanted advice from people who have to live with the rules every day — people who own waterfront property, develop it, and sell it; as well as people who have to interpret, administer and enforce the rules; and people





(BOTH PHOTOS) KATHERINE ESPOSITO

Piers, hoists and boathouses are covered in a separate set of rules. One option for minimizing their consequences is creating community marinas *(right)* in areas where lots of separate boat launches would be more intrusive on a lake or river.

who represent the public's interest in clean water, scenic beauty, good habitat and recreational opportunities."

This committee is developing its final recommendations and this fall a series of listening sessions held around the state will share these recommendations with the public. After DNR gets reaction from waterfront property owners, anglers, hunters, and others who enjoy Wisconsin's waters, revised recommendations will be reviewed by the advisory committee and the Natural Resources Board.

"We are hoping to open up this very old code to provide more flexibility for homeowners and counties while preserving wildlife habitat and water quality," Shea said.

Jerry Deschane, who represents the Wisconsin Builders Association on the advisory committee, echoes that sentiment. His members express frustrations that the current rules prohibit what appear to be relatively small projects and simple modifications to complete remodeling projects.

Builders most often run into problems when working on homes and other structures that are classified as nonconforming, like Nielsen's home on Muskellunge Lake, Deschane said. "We need a set of regulations that a lay person can understand and allows for simple upgrades of existing homes. I hope that this committee can agree to standards that will let that happen and improve the environment, or at least prevent any further harm," Deschane stated.

Phil Gaudet, one of three representatives from county zoning offices said his Washington County Planning and Parks Department just wrapped up a three-year effort to update their shoreland zoning ordinance. He found the statewide issues mirror concerns in his county. I hope the counties can live with the new statewide standards, he said. Many communities will choose to do more to protect unique areas, but at a minimum, we want requirements that protect shorelands everywhere in the state — water quality, wildlife habitat and scenic beauty.

Carmen Wagner is a water management specialist in DNR's Shoreland Section of the Bureau of Watershed Management.

Want to Know More?

To find out more about the revision process and locations of upcoming listening sessions, check the DNR website: www.dnr.state.wi.us. From the home page, look on the bottom of the page for the white box titled "Go to some topics." Click on the drop-down menu arrow, select "shoreland management" and look on the right hand side for the latest news on the revisions.

continued from page 2

Water shrews are active day and night.

although they can survive up to three hours without eating. A more typical pattern is 30 minutes of foraging followed by 60 minutes of resting. Shrews are active day and night in an activity pattern referred to as arrhythmic.

This shrew measures up to 6½ inches long with about a three-inch tail. Water shrews are mainly found in the northern two-thirds of Wisconsin, north of the tension zone near streams, lakes and wetlands. In winter they may hide out in the tangle of sticks that form beaver or muskrat lodges. They are also at home in the jumbled rocks, logs and undercut banks along forested streams. The shrew's dense velvety fur keeps it warm. Also air trapped between sticks and the water is often much warmer than the surrounding winter weather.

Water shrews are early breeders. Mating activity starts in late January and continues through late summer. A typical litter includes five to seven offspring and adults may have one to three litters in their 18-month life span. Nests are usually constructed in tunnels and in or under hollow logs. The nests are composed of shredded grasses and leaves. Young are weaned and independent at four weeks of age.

So if you see a black mouse-like creature walking on water, bobbing or swimming, your eyes are not playing tricks on you. You are one of the fortunate few to catch a glimpse of the secretive water shrew at work on the water.

Ann Bailey Dunn writes from Campton, Kentucky.

COMMENT ON A STORY?

Send your letters to Readers Write, WNR magazine, P.O. Box 7921, Madison, WI 53707 or e-mail letters to david.sperling @dnr.state.wi.us.

HOUSE DESIGNS

We visited the Spring Green Art Fair this July and met wildlife photographer Stephen Lang, whose photos have appeared in your pages. He gave us a copy of the magazine with the bluebird feature ("Thinking out of the box" April 2001, p. 10–13). Are the plans for building bluebird boxes still available?

Jeanne Fuhs
Baraboo

Absolutely. Plans for bluebird houses incorporating newer designs for shallower boxes were printed in our August 2001 issue. Copies of the plan are still available through our offices. Enclose a stamped self-addressed envelope and forward those requests to: Bluebird Plans, Wisconsin Natural Resources *magazine — CE/6, P.O. Box 7921, Madison, WI 53707.*

THE MYSTERY OF MISSING PERCH

I read with great interest the explanations of the declining yellow perch populations in Lake Michigan ("Adrift on the sea of life," June, 2003, p. 17–21). Apparently all the perch research is biological and neither predators nor economic effects of lower perch populations have been addressed.

I believe predator stocking of trout, walleye and muskellunge in Lake Michigan is a contributing factors to low perch populations. Predators are opportunistic feeders. After alewife populations went down, predators changed to smelt and when smelt populations went down, they changed to perch.

Obviously the small economic impact of no perch for the few commercial and pleasure fishermen in Lake Michigan is a back burner issue and is given lip service in 20 years of study. Perch contribute few tax dollars while trout, walleye and muskellunge bring in millions.

Hopefully all biological, predator and economic issues will be addressed and possibly save the Poor Man's Pleasure of perch fishing in Lake Michigan.

Thomas Heindel
Oconto

Southern Lake Michigan Fisheries Team Leader Brad Eggold and Lake Michigan Fisheries Biologist Bill Horns responded: *We certainly investigated these issues as part of trying to understand and explain the decline of the Lake Michigan perch population. We don't believe game fish predation of perch is a major factor because we have examined what game fish are eating. Bloater chubs made up 80 percent of the biomass available to trout and salmon but their stomach contents by weight were almost exclusively alewife. These fish are easier to swallow because they don't have the bony structure of perch and they live in different parts of the habitat where game fish are more prevalent. Other fish like bass, walleye and pike are found in the lake in relatively small numbers and in harbors and bays. Perch are generally out in the lake and don't come into contact with many game fish.*

Of course the diets of salmon predators vary seasonally, and yellow perch do show up in their stomachs, especially in spring. One circumstantial argument against the hypothesis that salmon prey heavily on perch is that yellow perch remained abundant and reproduced well through the 1980s despite high levels of salmon and trout stocking.

Biologists in Wisconsin and elsewhere believe that the problem for yellow perch has been in early mortality of offspring, so, if predation is the problem, we need to identify predators that target yellow perch during their first summer of life. For the most part salmon, and especially lake trout, occupy deeper colder water than young yellow perch during the summer. Walleye and musky are not stocked in southern Lake Michigan, so they are not the problem there. One predator that has received a fair amount of attention is the alewife, which can eat very young yellow perch and is often present when the yellow perch are hatching.

Combined with transport issues, alewives may be more of a factor, but environmental factors may have proven to be more important. Prevailing winds before late June were all out of the east and northeast.

The situation may be different in Green Bay, where white perch may be more of a factor with other predators, but that is a tough cause and effect to pin down. There is tremendous competition for food for one species over another. Green Bay is a more complicated system and the potential for interaction with other species, stocked and unstocked, is greater.

A FAN OF THE OLD TONICS

Thank you for information on witch hazel ("A charming fall bloomer," October, 1997). I've used it for more than 50 years to ease swelling and help recover from bruising such as sprained ankles. I also use it as a facial tonic and think it is much better than the expensive cosmetic ones. I have used witch hazel all these years and really had no idea what it was. It was just one of those things passed on by Mother in the 1940s having been passed on by her mother in the 1920s. Witch hazel must be OK because it is still in use and I see no ill effects. The story on your web page was nice and clear, not too technical. Thanks.

Margaret Hawkins
United Kingdom

The land between two rivers

RJ & LINDA MILLER

Wisconsin's Coulee Country is bound by beauty: The ever-shifting sandbars of the Wisconsin River skirt the eastern border of the region, while the backwaters of the Mississippi River embrace it on the west. Spend some time this month exploring the quiet hills and valleys of the Coulee counties and you will be rewarded with a bounty of late-autumn delights both natural and historical.

First, get yourself a proper map. The Coulee Pathways Heritage Tourism Project publishes a handy guide to the area; for a copy, call (608) 427-2090 and talk with Bonnie. Pick up a State Highway Map at any Tourism Information Center in the state. The Wisconsin Atlas and Gazetteer shows most every road, nook and cranny imaginable, and is available at many sporting-goods shops.

Start your journey in New Lisbon, Juneau County — where you can view the Gee's Slough group of Indian mounds just southeast of town on Highway 12/16. A few miles west on County Highway A going toward the village of Hustler, you'll find the Twin Bluffs Petroglyphs, carved by the Ho-Chunk people from 100 B.C. to 1650 A.D.

Look for other colorful names in the area. For instance, you can take it nice and easy on a cruise along Never Sweat Valley Road. Then again, a road is a road is a road, especially when it's Good Enough Road. And who knows? You might meet Wally and the Beaver…on Cleaver Road.

If you brought along your bicycle, head southwest to Elroy, where you can hop on the Elroy-Sparta State Trail. Formerly an old railroad track that carried early travelers and immigrants to the area, the trail now offers a comfortable surface for cycling and hiking. You'll pass through three tunnels and landscapes ranging from wetlands and farms to dry, sandy terrain. Or, bring your binoculars and go north of New Lisbon to the Necedah National Wildlife Refuge and the Meadow Valley State Wildlife Area, set in the center of the Great Central Wisconsin Swamp — the largest wetland bog in the state. The refuge counts coyotes, turkeys, gray wolves and beaver (not that Beaver) among its resident wildlife species.

Should your forays into nature leave you feeling out of touch with the modern world, visit the Harris G. Allen Telecommunications Museum, 306 Arthur St. in Tomah, Monroe County. You can place a call from the museum, but you'll need the operator on duty to patch it through…and listen in, of course!

Continue heading west to Sparta, where graceful buildings from other eras lend a calm dignity to nearly every street corner. The Sparta Depot, the Monroe County Courthouse, the Sparta Free Library, the Masonic Temple and the Sparta Post Office are listed in the National Register of Historic Places.

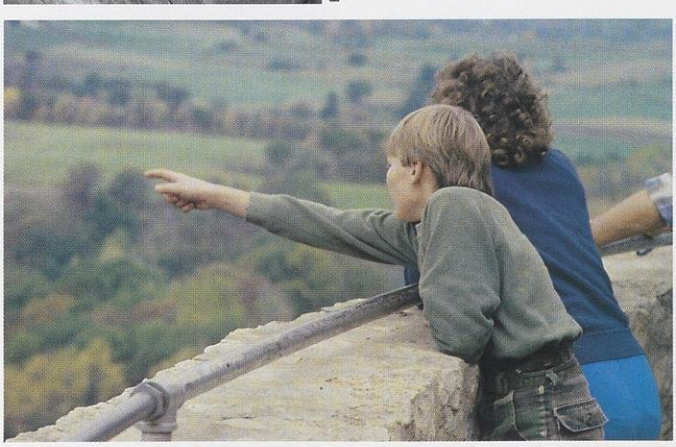
Feel like singing? Head a few miles north of town to Canary Avenue…near West Beaver Creek (not that Beaver). While you're trilling, take a peek at the Castle Rock.

The curving coulees of La Crosse and Vernon counties hold many surprises. The picturesque village of Coon Valley is certainly worth a stop. Get a glimpse of Wisconsin's ethnic heritage from aptly named landforms like Norwegian Hollow and Belgium Ridge (west of Viroqua) and Irish Ridge (northwest of Viroqua). Bohemian Ridge, which follows German Coulee Road, is northwest of Westby. Got that?

For fine panoramic views, visit Wildcat Mountain State Park near Ontario in Vernon County. From high lookout points along the park's many trails, you can view the knotted meanderings of the Kickapoo River below. Stretch back a century or more in nearby Mount Pisgah Hemlock-Hardwood State Natural Area, where relict stands of hemlock, yellow birch and white pine still hold forth in quiet majesty. And not that it matters to your feet — but here in Wisconsin's Driftless Area, the part of the Coulee counties left untouched by the last great glacier, you stand on some of the oldest sedimentary rock on the planet.

BILL MOORMAN

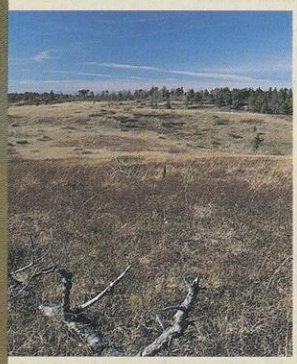
Coulee country travels offer scenic roads, petroglyphs and scenic vistas, like this view from Wildcat Mountain State Park.



ROBERT QUEEN

Wisconsin, naturally

Solon Springs Sharptail Barrens State Natural Area



Notable: Pine barrens with widely scattered groves of jack pine, Hill's oaks and red pine situated on rolling, glacial outwash sand plain. Maintained by fire, the barrens are vegetated with sweet fern, blueberry, dewberry, hazelnut and prairie grasses. Reindeer lichen hugs the ground. Birds that require large open landscapes are common here, including upland sandpipers, grasshopper sparrows and sharp-tailed grouse.

How to get there: From the intersection of highways 53 and County A in Solon Springs, go south on 53 3.5 miles, then west on Cut Away Dr. 0.5 mile to the southeast corner of the site.

Wisconsin Atlas: p. 93, grid B6