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WISCONSIN NATURAL RESOURCES


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A close-up photograph of a red-headed woodpecker perched on a tree trunk. The bird has a vibrant red head and neck, a white breast, and dark wings. It is facing right, looking slightly upwards. The tree trunk is covered in green moss and lichen, and the background is dark and out of focus.

Return of the loud redheads

Twenty years of
shared fishing rights

Wild hogs in the woods



Cup plant (*Silphium perfoliatum*) is a prairie sunflower with a square stem. Opposite leaves envelop the stem forming a funnel-like “cup” that traps a small amount of dew and rainwater that attracts insects and birds.

Encourage natural plantings that won't be cut down in their prime along roadsides.

Let the cup be unbroken

Lynn Kuhms

The tender springtime flowers are all dried up, but there's still steadfast growth as nature plows ahead to set seed and survive. Unfortunately, the roadsides that just recently were flush with prairie grasses, reeds, brambles and bright wildflowers have been shorn by public works crews. Their noisy tractors can reach with mower blades far past the road's shoulders into ditches to cut down plants that some people consider weeds. That happens several times each summer in my area. Miles and miles of roadside plantings could provide shelter and forage for wildlife, as well as lush, colorful country scenes.

I'm sure some think that the roads are now safer for motorists. And maybe others think it looks nice. But when our rural roadways are wide and racetrack bare, the tendency for motorists is

to speed even faster. And I have to ask what's better looking, and better for our countryside wildlife, than leaving the roadside alone...green, vibrant and growing?

The answer lay silent at my feet. Just a bit north of my Town of Winneconne home is Sunset Trail, a mile-long residential road. One conservation-minded neighbor there — a retired USDA Forest Service Ranger who keeps his yard more lush and natural than mowed and manicured — was amazed that those huge mowers came all the way down his quiet, dead-end street. When he first saw the mowed-down stubble of wildflowers and prairie grasses left dying and drying near his driveway, he flagged me over on my morning walk and pointed to the rubble of inch-long ragged stems left behind.

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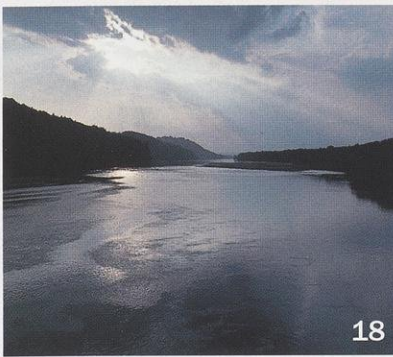
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ROBERT QUEEN

FRONT COVER: Red-headed woodpecker (*Melanerpes erythrocephalus*) populations have been declining in Wisconsin for about 60 years. Recent research suggests that leaving more standing dead trees can help restore larger populations of these colorful birds.

JACK R. BARTHOLMAI, Beaver Dam, Wis.

BACK COVER: Dewey Heights Prairie State Natural Area overlooking the Mississippi River in Grant County. For more information, or to order a guidebook to State Natural Areas, contact the State Natural Areas Program, Bureau of Endangered Resources, DNR, P.O. Box 7921, Madison, WI 53707 or visit www.dnr.wi.gov/org/land/er/sna.

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Wild

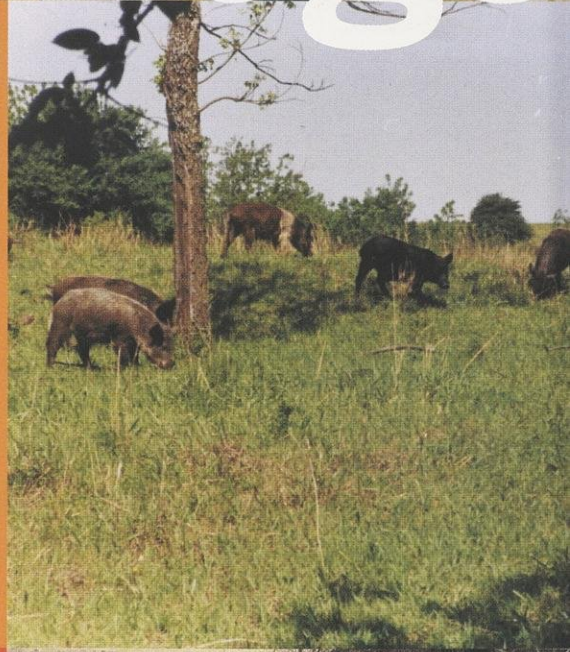
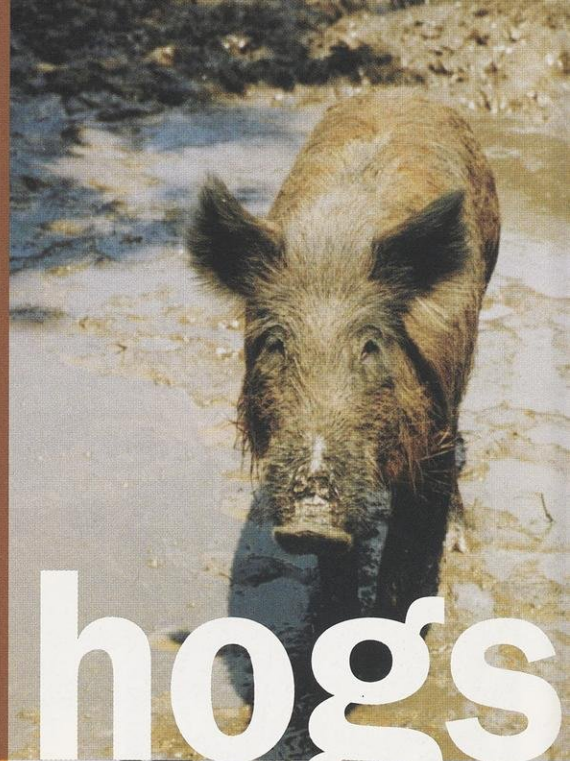
Wildlife and agriculture officials take a stand in the mud to ferret out feral pigs from pockets of the Wisconsin countryside.

Feral pigs (*Sus scrofa*) have gained a foothold in 23 states including 15-16 pockets in 25 Wisconsin counties. Reports in the last three years remain rare, but are more prevalent in Crawford and La Crosse counties.

Young feral hogs forage with the sows in family/social groups called "sounders." The boars are solitary except during mating seasons.

Feral pigs are omnivores that are mainly nocturnal, feeding on roots, shoots, tubers, nesting birds, fawns, livestock and carrion. Of greater concern, the hogs can contract and spread communicable diseases to wildlife, domestic livestock and people. Potential disease spread to domestic swine herds could have more serious, expensive consequences.

hogs





Feral pigs scrape out wallows to beat the heat and stave off biting, burrowing parasites. The wallows add to erosion and disturb sensitive habitat.

in the woods

Kyle LaFond

In the past four years, conservation wardens and wildlife biologists in western and northeastern Wisconsin have spent considerable time responding to periodic reports of wild pigs. Unfortunately these animals are not well-bred, barnyard variety porkers, but they are very intelligent animals. Their discovery threatens farmlands, farm herds and sensitive wild habitat.

Though now well established here, feral pigs are not native to the United States. They are descendants of animals that came ashore with colonists and conquerors. Pigs were first introduced into southern coastal areas by Spanish explorers during New World exploration/exploitation. The population and distribution of feral pigs has increased to 23 states and they especially cause problems in southern states where milder temperatures encourage larger herds that grow more quickly. Feral pigs today are most plentiful in the coastal states along the Gulf of Mexico, California and along the Eastern Seaboard north through the Virginias. Many are descendants and hybrids of Russian wild boars originally introduced for hunting. Through each successive generation, domestic character-

istics have diminished and the animals have developed traits necessary to survive in wild environments.

Feral pigs are usually smaller, leaner and more muscular than domestic swine. They possess larger and more elongated snouts, longer and coarser hair, straight tails with sparse hair, and big tusks. (The upper ones are often 3-5 inches long and are canine teeth that grow continuously. They are used for defense and for establishing breeding dominance.) Their cloven hooves and tracks look a bit like deer tracks. These wild pigs are also mean and fast. The pigs normally trot between feeding areas and then slow to a walk. They can run for short spurts at speeds up to 30 miles an hour and are good swimmers. Feral pigs have poor eyesight, but excellent senses of hearing and smell that

they have honed in adopting nocturnal lifestyles. Coloration is highly variable. Most adults and juveniles are black, but colors range to white, buff and belted. Some have moderate striping that helps conceal them.

Feral pigs are extremely adaptable and highly reproductive. Under optimal conditions, female pigs may breed as early as six months of age. Sows typically produce two to four litters per year of four to 10 piglets per litter. Food and nutrient shortages can delay breeding and reduce the number of piglets, but feral pig populations rebound quickly when conditions improve.

Feral pigs may have a lifespan of six to 10 years where conditions allow. Most die from starvation, parasites, disease, accidental death, predation and hunting.

Smart, secretive swine

Feral pigs rely upon several types of habitats — nesting areas during daytime where they rest and wallows to minimize the influence of foul weather. These sites commonly consist of dense vegetation near a natural source of water. Second, feral pigs use more open and exposed feeding and watering areas at night, typically agricultural fields, wetlands and woodland open-



Where feral pigs have been established for decades or longer, wildlife officials have more experience designing sturdy traps and baits to catch and hold them. Colleagues in Alabama use mixes of soured corn, other grains, molasses and fruits to lure in the wary pigs.

ings. Both nesting and feeding sites are messy mixes of wide trails with lots of tracks, scat and wallows. Wild pigs scratch the ground to dig out wallows to create muddy areas where they can escape the heat and roll in mud to fend off biting insects.

Wildlife biologists look for signs of wild pigs from the air. Where feral pigs are abundant, they move at dawn and dusk between nesting and feeding areas. That's when they are most often seen by hunters.

Feral pigs are social animals that travel in groups called sounders. A sounder typically consists of one or more sows and their offspring. Weaned piglets remain with their mother until another litter is due or until they reach sexual maturity and begin mating. Adult boars (usually older than 18 months) are almost always solitary animals that consort with sounders only to mate or nose their way into productive feeding areas.

Food abundance and availability

dictate their range. In times of plenty, the ranges are pretty small. Winter ranges expand as food and protective shelter become scarce. Spring and summer ranges are usually much more concentrated near recently planted, growing crops.

Feral pigs are opportunistic omnivores that eat, well...like pigs, consuming a wide variety of plants and animals. Where wild pig populations build up, they damage crops during the spring planting season, rooting for tender roots, shoots, bulbs, tubers and the nutritious early growth. Berries, fruits, roots, tubers, agricultural crops, crayfish, salamanders, snakes, eggs, ground-nesting birds, fawns and young livestock are all eaten. Fall is also a feasting time when acorns, nuts and other mast are plentiful. Feral pigs also scavenge on any animal matter that they may happen across including the remains of dead animals, weak or sickened animals, and newborns of both wild animals or domesticated livestock.

So, how did they get here?

Barstool biologists speculate how feral pigs arrived in Wisconsin. Three theories seem most plausible. The first suggests feral pigs escaped or were intentionally released from game farms. The second holds that feral pigs had been released by recreational hunters for sporting and training purposes. The third and most popular assumption is that bear hunters released feral pigs to train their dogs to pursue bears. Since wild pig populations are so spotty and seem to build up in small pockets with huge areas between them, human intervention in establishing these populations seems like a more likely explanation.

Biologists from other states also note a correlation between feral pig populations and trophy whitetail deer populations. That's led some to speculate the pigs may have been stocked by poachers who want to illegally harvest trophy deer out of season under the guise that they are hunting feral pigs. In many states including Wisconsin, feral pigs



DAVE MATHEYS, WISCONSIN DNR

LEFT: Corn damaged by feral pigs in western Wisconsin.

BELOW: This 300-pound sow was trapped and fitted with an ear tag and a radio transmitter cinched to a dog harness. Wildlife researchers are studying the wild pigs' home range patterns, behavior and habitat use to develop control techniques.



CHRIS JAWOROWSKI, ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Crop damage is small compared to the threat feral pigs pose as a vector for spreading communicable diseases. Feral pigs carry several diseases that can spread to domestic livestock, wildlife species and humans. Swine brucellosis and pseudorabies outbreaks would be especially devastating to commercial pork producers. The industry has invested heavily in testing and disease-control programs to prevent outbreaks of both diseases. The chance that wild pigs could harbor these diseases and subsequently infect a domestic herd is a huge concern to commercial producers. Swine brucellosis causes abortions in sows and infertility in boars. This disease is non-fatal, but it spreads readily and can severely reduce reproduction and profits on swine farms. Infected animals are disease carriers for the remainder of their lives as there is no effective treatment. Removing and sacrificing infected pigs is the only effective means of containing swine brucellosis outbreaks. Further, the disease has affected cattle and humans in very rare circumstances.

Pseudorabies is caused by a herpes virus and is not related to rabies. The virus compromises an infected animal's immune system leaving it susceptible to other diseases. Infection also causes abortions and stillbirths. Carriers are infected for life and must be removed from the population. Pseudorabies infection can have serious consequences if transmitted to domestic livestock, but can't spread to people. Cattle, sheep, goats, dogs, cats and rodents are all

spawning areas for fish species.

Beyond the threats to natural habitats, the United States Department of Agriculture (USDA) estimates crop damage by feral pigs costs the U.S. farm economy about \$800 million annually. Damage to croplands in the spring and summer during planting and early growth is especially acute.

susceptible to this disease and may die following infection.


If feral pigs become infected, they could become a reservoir of serious disease threats like tuberculosis, trichinosis, anthrax, foot and mouth disease and classic swine fever that we are trying to keep out of the state and the country.

Feral pigs are destructive, non-native, wild animals. The Wisconsin Department of Natural Resources supports the aggressive removal of feral pigs wherever they occur since established populations may have many adverse, long-term consequences. Though pockets of feral pigs have been sporadically reported in Wisconsin, the only known self-sustaining population is a group of about 130 animals living in a 50 square mile region of Crawford County.

Please act responsibly and don't stock or introduce feral pigs into the state. If you are aware of anyone stocking or introducing feral pigs, please contact and alert your local conservation warden.

Tips for wild pig hunters

Feral pigs are currently classified as an unprotected species in Wisconsin, which allows hunters to pursue them throughout the year without any season or bag limit restrictions. To harvest a feral pig, the hunter only needs a small game license, or its equivalent, and the permission of a landowner if hunting on private property.

After harvesting a feral pig, contact the local conservation warden or wildlife biologist. These professionals will document your harvest and withdraw blood samples to test the animal for disease. If you choose to keep the animal for personal consumption, wear protective disposable rubber gloves when field dressing and cleaning the animal. Avoid direct contact with blood and reproductive organs. Bury the offal. Clean and disinfect all equipment after use. Cook the meat thoroughly. 

Kyle LaFond formerly served as a DNR wildlife biologist and the assistant bear and elk ecologist.

are regarded as a nuisance species that may be hunted throughout the year using the same firearms as one would use for deer hunting.

Why contain wild pigs?

The discovery of feral pigs in several locales throughout Wisconsin raises concerns for crop damage in the immediate area and more widespread threats to animal health and agribusiness.

Biologists throughout southern states have documented damage and real destruction that feral pigs bring to the landscape. They compete for food with deer, grassland birds like quail and upland birds like turkeys. Most alarming, the wild pigs can root and decimate sensitive landscapes that contain or support threatened or endangered species. Pigs can also spread invasive species by rooting vegetation and disturbing ground cover. In wetland habitats pigs have destroyed areas essential to migratory game birds, songbirds, amphibians, reptiles and small mammals. Feral pig activity may also cause erosion and, in the process, lower water quality, harming

To determine how many fish could be safely harvested by anglers and spearers, both DNR and tribal fisheries managers had to learn a lot more about lakes in northern Wisconsin and the people who fish these waters. Better estimates of fish populations, population structure, growth rates, survival rates and fishing pressure were a must.

Ben Heimbach is one member of the DNR fish crews who trap, measure, mark and release fish each spring.

A



generation

of shared rights and shared responsibilities

Two decades after treaty fishing rights were reaffirmed, resource managers have more knowledge and stronger working relationships to share a harvest and sustain northern Wisconsin fisheries.

Lisa Gaumnitz and David L. Sperling

Each spring as the ice melts on northern Wisconsin waters, anglers start getting ready for the fishing season by pulling their boats out of sheds, lubing their fishing reels and checking their trailer lights. At the same time members of Wisconsin's six Ojibwe tribes get ready for a traditional harvest that resumed in 1985 — off-reservation spearfishing of walleyes that gather in shallow spawning areas.

As in past years, fisheries biologists using models and up-to-date survey data determine how many walleyes can be safely taken without endangering fish populations. Tribes declare how

many fish and which waters they will harvest. Creel clerks measure and monitor the take. Following the harvest, daily bag limits for sport anglers are adjusted and announced through newspapers, websites and postings at boat launches.

In the 22 years since the courts reaffirmed the Ojibwe's rights to spearfish off-reservation, as they had continuously done on their reservations, the tribes and Wisconsin Department of Natural Resources have built a stronger working relationship and learned a lot about the fisheries. Wisconsin communities have reached a peace in sharing the harvest. And while it's not a perfect

arrangement, there's more fisheries work done on a wider area, fish populations are still stable, fisheries biologists know a lot more about the fisheries they manage, and some interesting projects have developed as a consequence of the need to collectively manage northern Wisconsin fisheries.

Modern fish spearing off-reservation has continued for 20 years

The landmark 1983 "Voigt decision" by the Seventh Circuit Court of Appeals determined that the Ojibwe had retained rights to hunt, fish and gather wild rice on lands they ceded to the federal government in treaties signed in 1837 and 1842.

The treaties functioned like a real estate transaction, says Charlie Rasmussen, Great Lakes Indian Fish and Wildlife Commission (GLIFWC) writer and historian. The federal government gained portions or all of what are now 30 northern Wisconsin counties, and the tribes retained rights to hunt, fish and gather on the lands, similar to when land is sold and the landowner retains mining rights.

The decision brought relief and happiness for Red Cliff tribal member Mark Duffy. He grew up listening to elders' stories of trying to evade detection, or getting arrested while fishing or hunting off-reservation.

"Suddenly, something tribal members had to do sneakily, behind the backs of the wardens to feed their family and keep up their tradition was legal for them to do," he said.

Tribal members started off-reservation spearfishing again in 1985 under interim rules negotiated by GLIFWC, which the tribes created in 1984 to coordinate and implement the treaty rights.

Negotiations continued to create a permanent system that provides for tribal fishing rights and a sport fishery while maintaining fish populations.

"It became apparent early on that somebody was going to have to set total allowable catches for each lake, and the only way to realistically do that was to make some kind of population estimate," says Mike Staggs, DNR's fisheries director. "Likewise, we knew we'd have to have much more accurate accounting of both the treaty harvest and the sport harvest, so we'd have to upgrade our creel surveys."

At the time, Staggs was a systems ecologist for DNR's Bureau of Fisheries Management, and was assigned, along with Mike Hansen, now a University of Wisconsin-Stevens Point fisheries professor, to DNR's treaty fisheries team.

Staggs spent the better part of a year developing the population surveys for walleye, and determining annual angler fish harvest. After culling through past population estimates and creel surveys, he found that anglers caught an average of 955,900 walleye annually and kept 672,303, or 70 percent. He found that the total annual harvest came mainly from a relatively small number of successful anglers — seven percent — who each caught one or two fish, rather than a few anglers catching a large number of fish per trip.

Hansen developed a model that could be used to set the harvest quotas for walleye.

Meanwhile, the tribes and GLIFWC were developing their own population

estimates, methodologies and regulations. Each tribe regulates fishing on its own reservation under its own codes, and has adopted codes that regulate off-reservation fishing.

While the tribes and DNR staff were able to negotiate many aspects of the systems, the courts settled some contentious and critical issues.

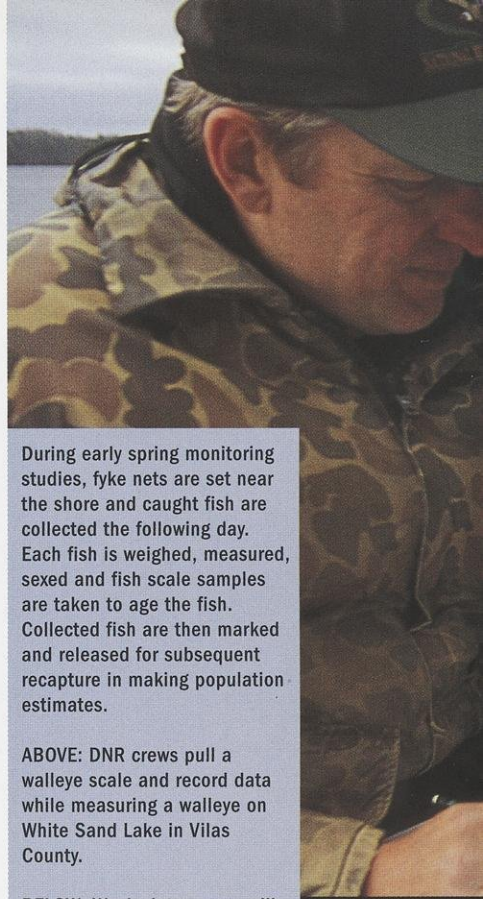
On May 9, 1990, Judge Barbara Crabb ruled that the tribes would be entitled to a maximum of half of the fisheries resource available for harvest. She also ruled that the total number of walleye harvested by Ojibwe spearers and sport anglers combined should not exceed 35 percent of the adult walleye population on more than one in 40 waters in any given year, to avoid the risk of overharvest.

"Nobody got everything they wanted," Staggs says of the system. "Sport anglers had to give up some of their harvest. Tribal folks got tighter regulations than they wanted. But she crafted a brilliant decision, particularly for not being a fisheries person, and it has stood the test of time."

How the harvest is managed

Under the system Judge Crabb crafted, DNR and GLIFWC biologists set the number of walleye that can safely be harvested from each lake by the combination of tribal spearers and sport anglers. The tribes declare which lakes they want to spear, and what proportion of the safe harvest they plan to harvest. The six tribes work together through an intertribal task force to coordinate their declarations. DNR fisheries biologists use the tribal declarations to determine daily bag limits for sport anglers on those particular lakes. The tribes' declaration, and the corresponding daily sport bag limits are announced in April. Daily bag limits for sport anglers are increased later that summer, usually before Memorial Day, if the tribes have harvested fewer fish than they declared.

Each spearer is required to get a permit that day for the lake he or she intends to spear that night. The number of permits issued is limited by the remaining quota. Creel crews hired by



During early spring monitoring studies, fyke nets are set near the shore and caught fish are collected the following day. Each fish is weighed, measured, sexed and fish scale samples are taken to age the fish. Collected fish are then marked and released for subsequent recapture in making population estimates.

ABOVE: DNR crews pull a walleye scale and record data while measuring a walleye on White Sand Lake in Vilas County.

BELOW: Weeks later crews will cruise the perimeters of the same lakes with boom shockers sampling fish in the shallow waters to make statistically accurate estimates of the fish populations.





ROBERT QUEEN

GLIFWC count and measure each spearer's harvest as the spearers come ashore for the night.

Though Ojibwe can exercise their treaty rights to fish off the reservation throughout the year, they harvest almost all walleye during the spring spawning season. Adult fish are easiest to spear shortly after the ice melts when waters start to warm and walleye congregate in shallow water. On average, the combined tribal spearing harvest by 300-400 Ojibwe who participate is 25,000-30,000 walleye a year. Since 1990, Wisconsin's 1.4 million licensed sport anglers have harvested an average of 274,000 walleye per year. The tribal harvest is spread over the 144 lakes the tribes spear on average each year; the angler harvest is spread over the 859 classified walleye lakes in the ceded territory. On a lake-by-lake basis, the proportion of walleyes harvested by anglers and by tribal spearers is similar.

A track record of sustaining a fishery

"The system is doing what it was intended to do," Staggs said. "It allows for a tribal harvest that meets tribal needs

and for a sport fishery — and it has a track record of generally protecting the walleye and musky populations."

A 1991 joint study by DNR, the U.S. Fish and Wildlife Service, GLIFWC and the tribes found as much. Concern over violence in the early years of treaty fishing spurred Congress to pass a special appropriation to fund the joint assessment. The resulting report, "Casting Light Upon the Waters: A Joint Fishery Assessment of the Wisconsin Ceded Territory," concluded: "People concerned about the fishery resource of northern Wisconsin can be confident that it is being carefully studied and is protected. Chippewa spearing has not harmed the resource. Fish populations in the ceded territory are healthy."

A UW-Madison study a decade later found that walleye populations on 859 walleye lakes were well within the ranges biologists consider healthy.

Shortcomings in system

Staggs and other DNR fisheries folks are quick to note, however, that the system isn't perfect, and the Department of Natural Resources and the tribes don't always agree on a management approach.

For instance, DNR manages musky as a trophy species, setting lower harvest limits and higher minimum sizes to allow fish to reach trophy status. The agency has some concerns about both tribal and angler harvest of big fish on specific waters in the ceded territory.

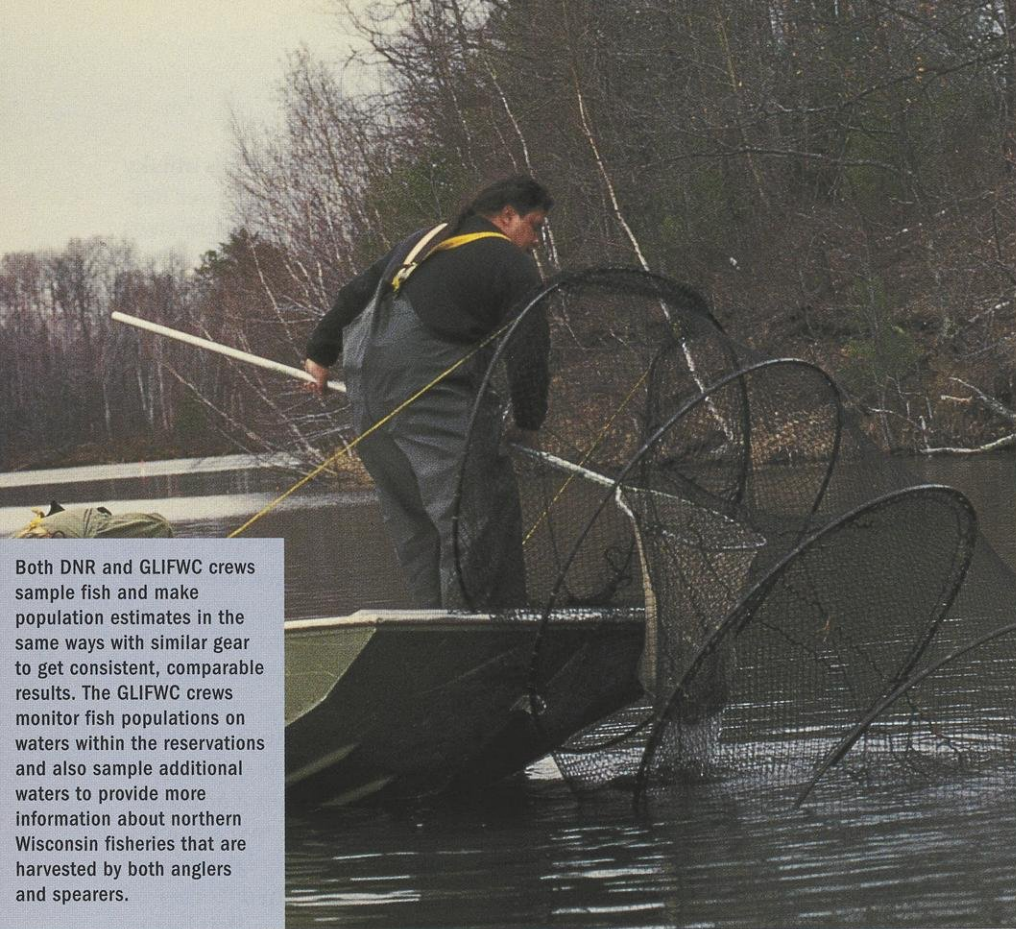
Over the next few years, DNR's treaty fisheries team will be re-evaluating its musky management in the ceded territory, similar to the re-evaluation recently completed for walleye.

For their part, the tribes still express a need for more fish to feed their families and use during ceremonies, said Mic Isham, GLIFWC Board of Commissioners chair and Lac Courte Oreilles member.

The recent joint walleye recovery project on Kentucky Lake is emblematic of the sometimes rocky, but worthwhile relationship between the two agencies. The 957-acre Vilas County lake experienced a still unexplained series of walleye year class failures that began in 1988. GLIFWC and the tribes were convinced that remedial actions should be undertaken. In 1997 they presented the DNR with a walleye rehabilitation plan.

"The initial DNR response to this plan was not favorable," said Isham. "But after two years of debate and discussion, GLIFWC, DNR and the tribes agreed to proceed with walleye rehabilitation efforts. Tribal fish hatcheries from Red Cliff, Lac du Flambeau, and Mole Lake and the Genoa National Fish Hatchery coordinated efforts to produce and stock walleye fry and fingerlings that would provide a foundation for natural reproduction in Kentucky Lake. In addition, harvest was reduced through a voluntary moratorium on treaty spearing and stricter harvest regulations for anglers. Together, these measures helped the Kentucky Lake walleye population come back stronger than ever. Tribal spearing has recently resumed and a more liberal harvest regulation for anglers is expected in 2006."

Protests and confrontations at the landings from those early days of spearfishing have waned. "After 20 years, people realize they are still catching walleyes," says Steve Ave-Lallemant, DNR's northern Wisconsin



GREAT LAKES INDIAN FISH & WILDLIFE COMMISSION

Both DNR and GLIFWC crews sample fish and make population estimates in the same ways with similar gear to get consistent, comparable results. The GLIFWC crews monitor fish populations on waters within the reservations and also sample additional waters to provide more information about northern Wisconsin fisheries that are harvested by both anglers and spearers.

fisheries coordinator.

Still, there's an undercurrent of resentment among some sport anglers and some Northwoods residents. Much of that has to do with perception that sport anglers have lost fishing opportunities.

In practice, however, the vast majority of anglers didn't even come close to catching their limit of five before spearfishing started off-reservation. Fully 93 percent of anglers fishing on walleye lakes didn't catch any walleye, according to creel surveys from 1980-1987. Only 3.8 percent caught one fish, 1.6 percent caught three fish, and 0.5 percent caught the legal bag limit of five.

The fish they caught, overwhelmingly, were good eating but not wall-hangers: 65 percent were less than 15 inches and only five percent were 20 inches or greater.

"Everybody wants walleye and they're the toughest ones to get," AveLllement says. "Our studies on an experimental lake, Escanaba, show that walleye density is only loosely related to catch rates. There were low catch rates even in years when fish were more abundant. If the fish were full of food, you couldn't catch them regard-

less of the density."

Other studies at Escanaba Lake demonstrated that new technology — fish finders and the like — didn't make a significant difference on catch rates either.

AveLllement thinks some anglers grumble because they don't like the idea of spearing fish before they've spawned. But 84 percent of the fish speared between 1989 and 2003 were males, nine percent females, and the rest of undetermined sex, according to the 2003 joint fishery assessment update. In some years of late ice-outs, anglers are also fishing for spawning fish.

More importantly, he says, the system establishes an overall total allowable catch and appropriate annual harvest restrictions for each water, and the tribes and anglers are abiding by those levels.

Protecting habitat on northern lakes makes much more of a difference for providing strong fish populations and good fishing in the future, AveLllement says. A growing body of studies is showing that fish habitat is being eliminated or degraded as a result of waterfront development. More homes and bigger homes are sending more runoff into the water and polluting it. More

people are clearing shallow water and the adjacent shoreland of native plants, shade trees and downed trees — all important habitat for fish. In turn, these changes are taking a toll on fish growth rates, abundance and the composition of the fish community.

"I'll have people argue that they don't believe this study or that study. I tell them that what has changed the most in the Northwoods isn't farming or treaty fishing. What has changed is people — the number who come here to live, to develop the shoreline, and to recreate on the waters," AveLllement says.

Benefits of the treaty monitoring system

In addition to meeting its biological goals, the system Judge Crabb put in motion 15 years ago brought many other benefits to Wisconsin anglers and fish. Perhaps the greatest boon has been additional staff and focus devoted to walleye and musky populations — and the resulting wealth of information.

GLIFWC was formed, and all of the tribes established or beefed up natural resources staff. DNR hired new fish biologists and technicians, paid for by state tax revenues after then-Gov. Thompson and lawmakers agreed that Wisconsin's walleye fishery was a valuable resource that warranted proper monitoring and staffing. That tax revenue has been cut significantly over the years but has been partially offset by money from fishing licenses and some tribal gaming money so that DNR can continue its share of work.

DNR, GLIFWC, three of the tribes and the U.S. Fish and Wildlife Service now coordinate their efforts to survey different lakes, and as a result, significantly more are getting done at less cost to the individual organizations.

The result, says Larry Wawronowicz, Natural Resources Deputy administrator for the Lac du Flambeau, is "we know more now about walleye and musky dynamics here than in any other region in the United States."

The information is better and more reliable. Treaty fishery work led DNR to initially bring fisheries biologists and

technicians from across the state to take on this new survey work. Staff were able to share their different techniques and gear and find out what worked best in northern waters.

DNR used those insights, and, working with GLIFWC and tribal fisheries staff, set standard methods for conducting fish population surveys — determining where they'd set fyke nets, when they'd electrofish based on water temperature, what gear they'd use, how they'd use it, what methods they'd use for choosing representative lakes, and other key things, Staggs said.

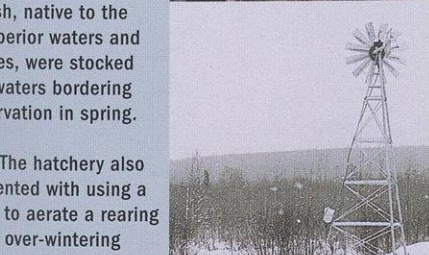
"The only way to get a good idea of how a fishery is changing in response to harvest is to sample it over time using the same methods and gear," he said.

The monitoring system grew out of necessity, he said, but it has produced a phenomenal amount of information that improved our regulations, stocking programs and the management of Wisconsin fisheries.



ABOVE: Sean Charette, hatchery manager at Red Cliff, checks a tray holding about 22,000 month-old coaster brook trout fry. These fish, native to the Lake Superior waters and tributaries, were stocked in area waters bordering the reservation in spring.

SUE ERICKSON, GLIFWC



BELOW: The hatchery also experimented with using a windmill to aerate a rearing pond for over-wintering walleye and coaster brook trout.

SUE ERICKSON, GLIFWC

It's also produced interesting research and insights on anglers and the fish they pursue.

Doug Beard examined how anglers responded to different daily bag limits and found that anglers initially spent more time fishing on lakes with a five-walleye daily limit than on lakes with a lower limit. But on waters with larger limits, anglers took longer on average to catch a fish. Over time, anglers started dividing their time more evenly.

Andy Fayram investigated the effectiveness of the 15-inch minimum size length limits instituted statewide in 1990 on waters with self-sustaining walleye populations. The research showed the regulation reduced the total number of fish harvested, but did not affect how long it took to catch a fish, or alter walleye growth rates.

In a musky study, Fayram found that catch-and-release rates increased significantly over a 10-year-period. Voluntary release can play as large a role in managing musky populations as regulations such as minimum length limits.

Finally, Fayram analyzed the effects of DNR's recommended stocking rates for walleye in the ceded territory. He found that 35 small fingerling per acre was an optimal stocking rate that would result in more young fish surviving to fall in their first year than higher stocking rates used in the past. DNR will begin stocking walleye at these lower rates starting next spring, allowing the agency to stock more lakes with walleye.

Benefits beyond regulations

The concentrated effort, year in and year out, on lakes in the ceded territory has brought other benefits to Wisconsin who fish. More fish are stocked in Wisconsin waters that don't sustain naturally-reproducing fish populations. DNR renovated its primary walleye and musky hatcheries in northern Wisconsin to meet rising demand for more, bigger, healthier fish for stocking. Fish hatcheries have been expanded at Lac du Flambeau and Red Cliff, and all tribes now maintain hatcheries to raise fish for stocking, including back into waters they spear.

More manpower is being directed at identifying and controlling zebra mussels, Eurasian watermilfoil, rusty crayfish and other invasive species that can harm fish and outdoor recreation. GLIFWC, for example, has a well-established program to combat invasive species.

The tribes' unique standing in the U.S. Constitutional system have enabled them to press the federal government for more stringent air and water quality standards that benefit all Wisconsinites who eat fish. "We manage our fisheries for subsistence fishing in addition to sport fishing," Wawronowicz said. "We are especially concerned that the fish we supply for every day consumption are edible and safe to eat. We are concerned that air and water quality standards be maintained to sustain those healthy fish as a healthy regular source of food."

He points to a recent lake sturgeon restoration project as another example. The tribe received a two-year federal grant to start to restore a lake sturgeon fishery within the Bear River system that links the Lac du Flambeau chain of lakes to the Mississippi River systems. "DNR staff helped us obtain lake sturgeon stock from the Mississippi River basin to maintain the genetic integrity of the fish we want to bring back for future generations."

Over the years, Wawronowicz says, there has been good cooperation among the tribes, DNR, the WATER Institute at UW-Milwaukee, the U.S. Fish and Wildlife Service, and other federal agencies.

Perhaps the most telling partnerships are at the water's edge. Members of the Eau Claire Lakes chain association work with the Red Cliff to collect eggs from female fish that tribal members spear. The tribe hatches the eggs, raises the walleye at their hatchery, and then provides the fish to the lake association to stock back into the Eau Claire chain. "There's a lot of cooperation to replenish the fish taken out of the lakes to maintain them at a more stable level." ■

Lisa Gaumnitz is Public Affairs Manager for DNR's water programs. David L. Sperling edits Wisconsin Natural Resources magazine.

It's no mystery:
These lively,
colorful
woodpeckers
love a
good snag.



A red-headed woodpecker pair chiseled out a nesting cavity in an old dead tree. Research shows that redheads prefer to nest in cavities more than 27 feet up in snags that are at least 17 inches in diameter.

The return of the *loud* redheads

Richard King and William Mueller

When more of Wisconsin's agriculture was based on small, self-sufficient farms, the line between the farmstead and wildlife habitat blurred. Family farms blended into the surrounding landscape, and the people who lived on them naturally blended wildlife into the rural experience. It shaped their lives and seeded the thinking of such pioneering conservationists as Aldo Leopold and Sierra Club founder John Muir.

Pastures were a mainstay on most of the 200,000 small dairy farms that once dotted Wisconsin's landscape. Pastures with small woodlots provided nutrition for dairy cows, fuel for woodstoves and excellent nesting habitat for many grassland birds. Pastures with large dead trees, or snags, were also home to one of Wisconsin's most colorful and tenacious birds, the red-headed woodpecker.

The red-headed woodpecker is a "loud" neighbor in every respect. It is easily Wisconsin's most colorful and animated woodpecker — a lively 10-inch package with a bright red head, full white breast, black on the back with broad



JACK R. BARTHOLMAI

Numbers of these once-populous woodpeckers have been in steep decline for more than 60 years. Competition from other birds and the dwindling acreage of open woodlands with large, old trees contributed to the decline.

white patches and a white rump — that aggressively drives off other species including blue jays, starlings, red-bellied woodpeckers and kingbirds. Its beauty and intense behavior inspired John Muir and drilled its way into his writings. The sheer abundance of red-headed woodpeckers on the Muirs' Marquette County farm in the 1850s is noteworthy because this species continues to decline in Wisconsin and throughout its range. Today it is included on the National Audubon Society's Watch List.

Although the red-headed woodpecker will occupy a variety of habitats, including golf courses, roadsides, and even

back yards, its nesting habitat is very specific: Without large, dead, barkless trees there will be no red-headed woodpeckers. Unfortunately, snags tend to have a negative image in the eyes of the public, as dead trees harbor insects and diseases, and may present safety concerns in urban environments if their big limbs snap off and fall on roofs, cars or people. Wildfire control and prevention reduce the number of snags in the landscape, as do "salvage" timber sales follow-



Redheads returned to the neighborhood as Tom and Kathie Brock started restoring open woodlands and removing overgrown brush on the ridges of their western Dane County woodlands.

COURTESY OF TOM & KATHIE BROCK

ing fires, insect and disease outbreaks, and windstorms.

The good news for red-headed woodpeckers and many other wildlife species that depend on snags is that the public perception of snags will change as our collective understanding and appreciation of the vital role they play for wildlife grows. Although snags may not always result in the greatest financial returns for landowners, they are valuable long-term assets. In an essay published in 1939, Aldo Leopold wrote of snags, "The land-wise future farmer and landowner will leave those hollow-limbed veteran trees for the owls and the squirrels."

Restoring snag habitat

In the rolling hills of western Dane County, Tom and Kathie Brock are applying Leopold's land ethic to an abandoned farm. The 145 acres surrounding the Brocks' "Shack" is being restored to prairie and savanna habitat. Old fields have been planted to prairie and unde-

sirable species like buckthorn and honeysuckle have been removed where they crowded sprawling bur oaks. The Brocks donated the large walnut trees that were also crowding bur oaks to a local nonprofit organization, which will use the lumber to make furniture. All of the habitat work on this property has resulted in a boon for wildlife, including the red-headed woodpecker. According to Tom, "We started seeing red-headed woodpeckers when we started habitat restoration efforts on the ridgetop. Now they are year-round residents."

Like Leopold, the Brocks do most of the work on their farm by themselves. Unlike Leopold, they have the advantage of several government-sponsored programs to assist them. Most of the old fields on the property have been entered into the Farm Service Agency's Conservation Reserve Program (www.fsa.usda.gov/dafp/cepd/crp.htm), which provides landowners incentives to leave idle highly erodible fields. The Brocks also used the Natural Resources Conser-

vation Service's Wildlife Habitat Incentives Program (www.nrcs.usda.gov/programs/whip/) to clear the buckthorn and honeysuckle crowding the bur oaks that dominate the ridge tops on the property.

About the time Aldo Leopold was penning *A Sand County Almanac*, the red-headed woodpecker was reaching its highest abundance ever recorded in Wisconsin. Between 1932 and 1950, pioneering ornithologist A. William Schorger made 693 trips between Madison and Freeport, Illinois. Like any good ornithologist, Schorger noted by species the number of road-killed birds seen during each trip, recording 4,939 dead birds. Schorger found 389 red-headed woodpeckers during his study; only the pesky house sparrow was more abundant. More than 40 dead red-headed woodpeckers per year were found at the beginning of the study in the early 1930s. By 1948 this number had dropped to fewer than eight birds per year. Schorger was alarmed by the "steady and marked decline in the population of this woodpecker" but offered no recommendations for reversing the trend.

A look at red-headed woodpecker populations across Wisconsin paints an even bleaker picture. Data from the annual National Audubon Society's Christmas Bird Count, which has been held for more than 100 years, shows statewide wintering red-headed woodpecker numbers have dropped eighteen-fold since they peaked in 1946.

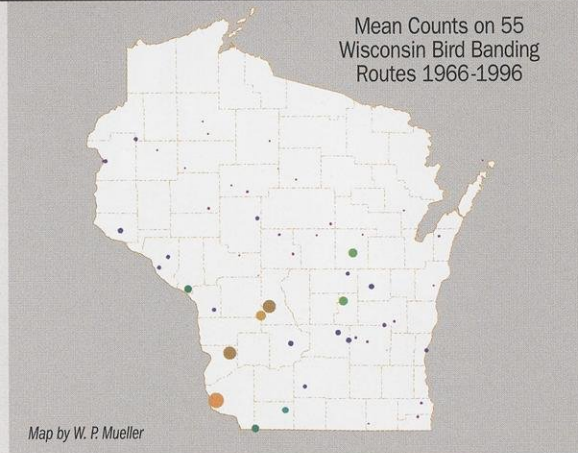
As abundant as red-headed woodpeckers were during Leopold's tenure in Wisconsin, they may have been more abundant during John Muir's days. Anecdotal information from his firsthand written accounts indicated plenty of birds. He wrote of summers "watching my favorite red-headed woodpeckers pursuing moths like regular flycatchers..."

Seeing all the land can be

Small abandoned farms provide unlimited opportunities to restore wildlife habitat and your own sense of what the land can become. Once you develop an understanding of that potential, you begin to see things that were always there but previously were obscured.

Red-Headed Woodpecker Counts on Wisconsin Bird Banding Survey Routes

Mean Counts




Your drives through rural Wisconsin will change forever. In fallow fields you will see grasslands teeming with nesting songbirds and pheasants. Old pastures will appear as prairie landscapes filled with flowers. And oak woodlots suddenly appear as savannas — homes for brilliantly colored birds like red-headed woodpeckers.

The lore of the Mekan River’s fabled brown trout fishing originally drew John and Fawn Shillinglaw to the Marquette County area. They eventually purchased 235 acres of an old farm on the county line to camp next to his favorite river. The property provided more than quick access to the Mekan. Isolated grasses and flowers growing throughout the property soon captured their imagination and inspired them to restore some of the prairie and savanna that originally dominated the landscape.

“In the beginning, I wasn’t aware of all the government programs available to landowners. So I just started harvesting seeds from wild plants on one part of my property and establishing them on other portions,” John Shillinglaw said. Their efforts were quickly rewarded as newly established patches of wild lupine were quickly colonized by Karner blue butterflies, a federally endangered species.

Like the Brocks in Dane County, Schillinglaw eventually learned about government sponsored initiatives such as the U.S. Fish and Wildlife Service’s Partners for Fish and Wildlife Programs (<http://partners.fws.gov/>) to restore prairie and savanna habitats. It was

Mother Nature, though, who arguably provided the most effective restoration tool for red-headed woodpeckers on the Shillinglaw property. In 2000, a hail storm pelted the area, damaging many aspen trees. Remembering how a pair of red-headed woodpeckers had once nested in a dead oak tree in his backyard in Appleton, Shillinglaw decided to leave the dead aspen trees standing. The hands-off approach was quickly rewarded. “I really hadn’t seen red-headed woodpeckers before the big hail storm, but there were several pairs present the next spring,” John said.

The value of snags for wildlife has been known for more than a century. Aldo Leopold himself co-authored a journal article on nesting red-headed woodpeckers in 1919. Other cavity-nesting birds, such as nuthatches, chickadees, bluebirds and other woodpecker species readily take to snags. If you spend time around snags, you will quickly see they are hotspots for other wildlife, too. Flying squirrels, porcupines, gray foxes and bobcats use snags, to name just a few. Landowners willing to leave snags on their property can expect to reap rapid rewards when a flush of cavity-dependent species, including those raucous, noisy and very welcome new residents, the red-headed woodpeckers, move back into the neighborhood. 

Richard King is a staff biologist at the Necedah National Wildlife Refuge in Juneau County. William Mueller chairs the Conservation Committee for the Wisconsin Society for Ornithology and chairs the Issues Committee for the Wisconsin Bird Conservation Initiative.

What redheads really want

Our independent research studies on the decline and management of the red-headed woodpecker (*Melanerpes erythrocephalus*) came to complementary conclusions. Mueller’s research lists the following primary reasons for the decline of the red-headed woodpecker in North America and Wisconsin:

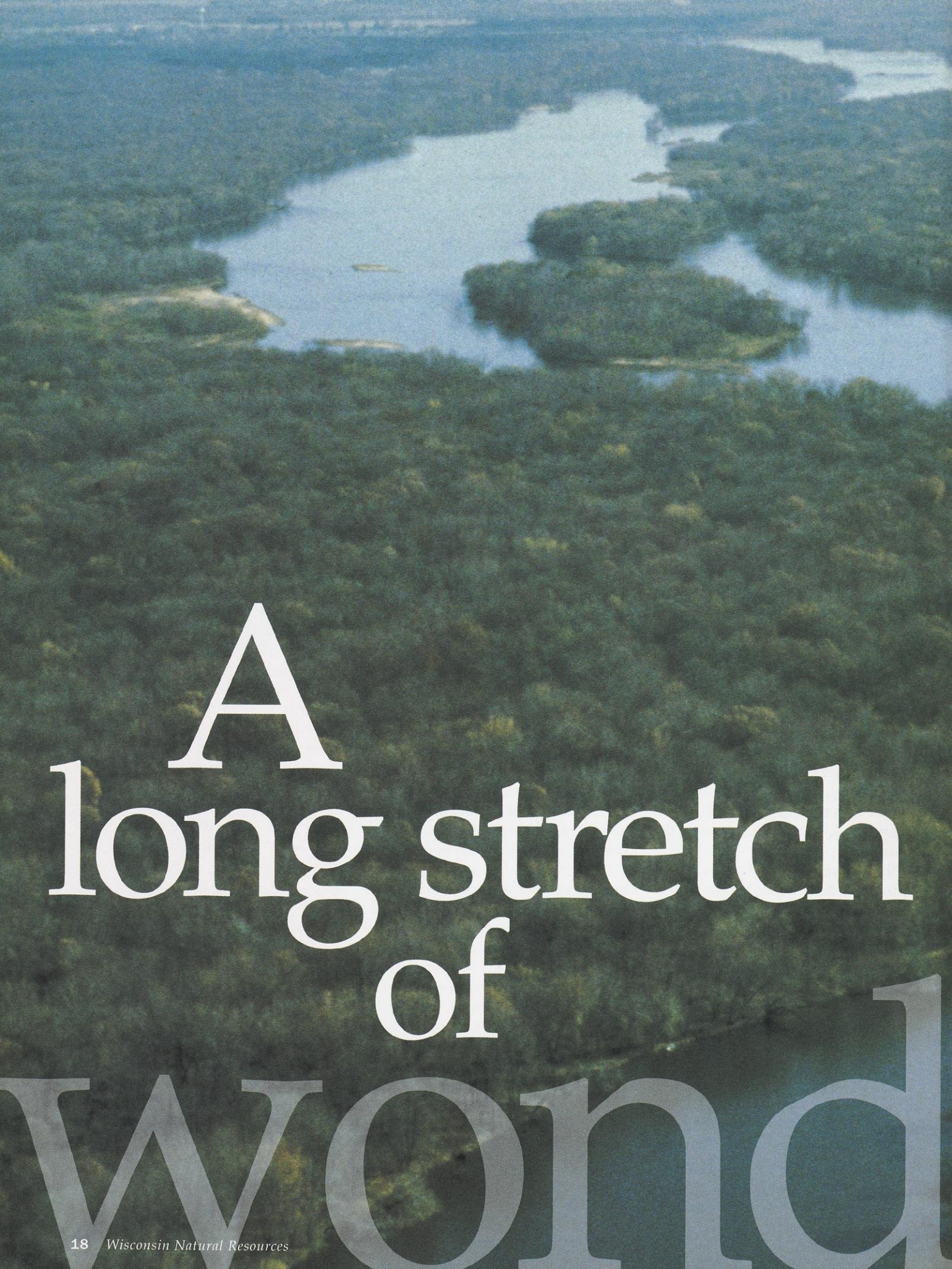
1. Habitat loss and alteration
2. Competition with the European starling
3. Vehicle-caused mortality
4. Loss of American elms to Dutch elm disease

Although the red-headed woodpecker uses other habitat types, oak savanna is one of the most important. Oak savanna once occupied approximately 5.5 million acres in Wisconsin. Only about 500 acres — less than 1/10th of a percent of the original, pre-settlement quality savanna remain. This loss and altered habitat is directly linked with the red-headed woodpecker’s population decline. Mueller studied the loss of habitat using a GIS (Geographic Information System) and data from annual Breeding Bird Surveys. He found a relationship between loss of open oak woodland and savanna and red-headed woodpecker population losses along bird survey routes in eight regions of Wisconsin.

King studied methods for improving red-headed woodpecker habitat at Necedah National Wildlife Refuge, where he is staff biologist. His work established a straightforward strategy for providing improvements including timber thinning, controlled burns and snag protection. Since these habitat improvements were carried out, more than 70 pairs of red-headed woodpeckers have established nesting territories on the Necedah refuge. The species is now the most common avian species in the restored savanna. King’s research discovered that:

1. Red-headed woodpeckers will occupy restored savannas before burning but are most abundant following burns.
2. Red-headed woodpeckers prefer to nest in dead trees or dead limbs on living trees (decadent trees).
3. Red-headed woodpeckers need large trees. Average cavity height is more than 27 feet, and average diameter of cavity trees is more than 17 inches.
4. Dead trees and dead limbs will bring more cavities and more cavities lead to more successful red-headed woodpecker reproduction.
5. On the restored savannas, tree density was 28 trees/acre, and snag density was 13 snags/acre.

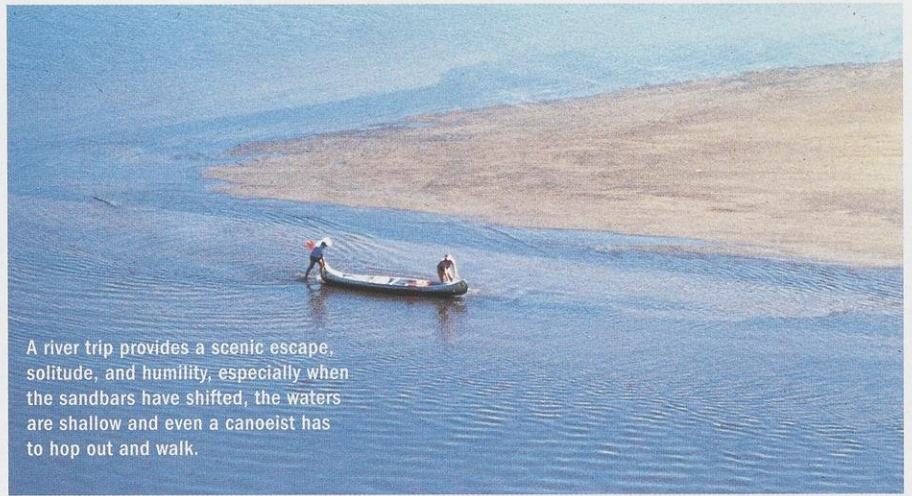
King’s research suggests there are practical and workable solutions for managing habitat for the red-headed woodpecker, especially if landowners and land managers save snags. Readers interested in seeing red-headed woodpecker management in practice can visit Necedah National Wildlife Refuge in Juneau County, just 20 miles off of I-94 from Tomah or Mauston.



A
long stretch
of

wonder

92 miles of sandbars, driftwood and diversity, the Lower Wisconsin State Riverway provides an escape for humans and a safe haven for rare fish.



A river trip provides a scenic escape, solitude, and humility, especially when the sandbars have shifted, the waters are shallow and even a canoeist has to hop out and walk.

MARK CUPP, LOWER WISCONSIN STATE RIVERWAY BOARD

Dave Marshall

One evening last September, Chuck and I headed upstream in my 14-foot fishing boat from Lone Rock on the Lower Wisconsin River. Five other dudes were canoeing downstream from Spring Green and our goal was to meet on one of the scores of sandbar islands to celebrate the end of Steve's long bachelorhood.

Navigating the Lower Wisconsin River is always a challenge. While the river is wide, a much narrower deep channel meanders back and forth, reflecting from shore to shore along its course. Well hidden within the dark water are broad shallow sand flats. If you don't read the river well, you'll suddenly be beached on a sandbar and find it's too late to change course. You'll end up hopping out and walking the flat, pulling the boat behind you, until you reach a drop-off at the edge of the deeper channel.

Forty-five minutes after we launched, Chuck and I found bachelor Steve, his brother Jeff, and the rest of the group already set up on a sandbar for a barbeque. We quickly settled in and enjoyed a few cool ones with grilled steak. Darkness was fast approaching and we gathered driftwood probably deposited when high water receded from this sandbar after the last spring flood. The river's endless motion continually eats away at sandbars, eroding some islands while simultaneously building others. Driftwood lines the riverbanks and the island shores, its source the dense floodplain forest.

Trees fall into the water in an infinite process; the downed trunks and branches provide basking habitat for rare Blanding's and map turtles while catfish hide below the submerged logs.

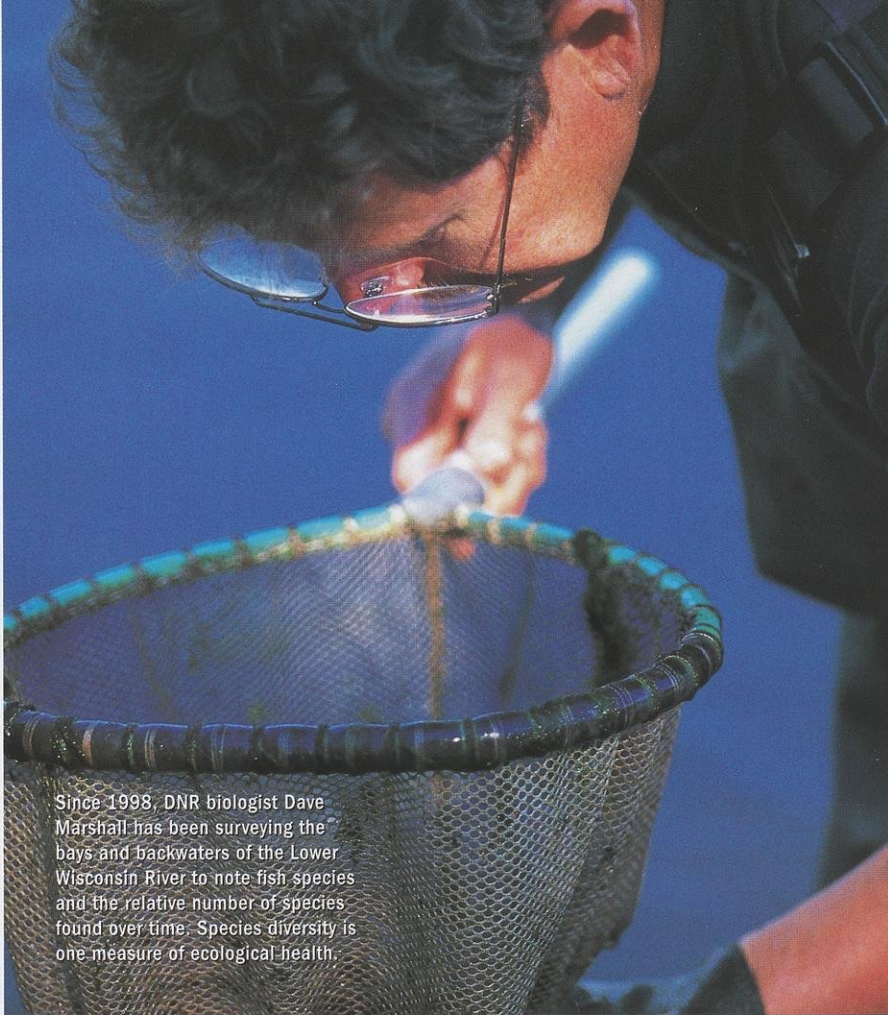
The fire crackled in the dark. Between Chuck's guitar and song, the yarns flew higher and more numerous than the mosquitoes in the crisp night air. Steve, Dave S., Jeff, Paul and John had paddled the river many times before. They share both personal and professional connections with the river, with technical backgrounds ranging from water chemistry to wildlife and fisheries research. In the quiet night, we heard fish frequently break the surface. A few of us fantasized about lunker smallmouth bass feeding at the surface. John wasn't sure, given the vast array of fish species living in the river. He's a fisheries scientist and curator of fishes at UW Madison Zoological Museum. John Lyons knows as much about what swims in this river as anyone. He has surveyed fish populations here for more than two decades and this river holds more fish species than any other lake or river system in the whole state.

Each year more than 400,000 people

From the dam at Prairie du Sac to its confluence with the Mississippi River south of Prairie du Chien, the riverway corridor protects bluffs, bottomland forests, backwaters and 98 of Wisconsin's 147 fish species.

MARK CUPP, LOWER WISCONSIN STATE RIVERWAY BOARD

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Since 1998, DNR biologist Dave Marshall has been surveying the bays and backwaters of the Lower Wisconsin River to note fish species and the relative number of species found over time. Species diversity is one measure of ecological health.

ROBERT QUEEN

brought about by intensive agriculture, heavy development and urban sprawl along riverbanks and lakeshores. In our zeal to live our lives ever closer to the water's edge we are collectively loving it to death.

Not so here. The Lower Wisconsin River shorelines are still a mix of undeveloped woodlands and prairies. The river's free-flowing channel, braided by scores of islands and sandbars, has countless connections with off-channel sloughs and wetlands. These mostly intact habitats preserve scenic and historical values as well as the unique ecological character of this important river.

Abundant fish, mussels, turtles and aquatic insects thrive in this blend of river and off-channel habitats. Of the 147 native fish species found in Wisconsin, Lyons has documented 98 native species from the Lower Wisconsin Riverway alone.

"The Lower Reach is among the least disturbed parts of the Wisconsin River and is one of the highest quality large warmwater river reaches remaining in the United States," he says. "The high diversity of fishes we find here reflects the natural riverine and off-channel lake habitats that would be destroyed if this section of river were dammed." Included in his list of fishes are ancient forms such as the silver and chestnut lampreys, shark-like paddlefish, lake sturgeon and shovelnose sturgeon, and the air-breathing gars and bowfin. Based on fossil records, some of these "living fossils" are nearly identical to their 100 million-year-old ancestors. Other unique and interesting fish include blue suckers, mooneyes, shoal chubs and western sand darters. Lyons notes the rare blue sucker, one of many riverine species adversely affected by dams elsewhere, is commonly found in the Lower Reach; the species inhabits deep swift channels and little is known about its breeding habits. As its name suggests, the western sand darter lives on the broad sand flats and literally dives into the sand as an escape mechanism.

The off-channel sloughs contain a different fish assemblage better adapted to lakes or slow current. Each one is somewhat unique with different ratios of

visit the Lower Wisconsin and explore the 92-mile-long stretch of water bisecting the hills and valleys of southwestern Wisconsin. They come to bird watch, boat, camp, canoe, hunt or play. They especially fish for a variety of sportfishes, including smallmouth bass, walleye, sauger, channel catfish and monster-sized flathead catfish. Everyone enjoys the scenic beauty of a river reach little changed since Native Americans and French explorers canoed its waters centuries ago, but most are unaware the Lower Wisconsin Riverway is also a storehouse of rare fish and other biological treasures.

Fluid habitat, numerous niches

Unlike many rivers and lakes whose shorelines become paved, tamed or manicured as part of a suburban homeowner's view of nature, the Lower Wisconsin River's wild character and wildlife habitats have been and will continue to be preserved through a number of state and local programs. Enacted in 1989, Wisconsin Act 31 created

the Lower Wisconsin State Riverway and a Riverway Board to preserve the scenic beauty and natural character of the river. This public-private partnership protects about 77,300 acres of land along the 92-mile river corridor. History, recreation, outstanding game fish populations and biodiversity are all preserved here. As a result, the Lower Wisconsin River has largely escaped manmade disturbances and sustains the intricate web of interdependent relationships woven over thousands of years. Importantly, this stretch of river never has been dammed, and that good fortune has both defined its nature and preserved its unique inhabitants.

Some of the most interesting and unusual fish species in the upper Midwest dwell within the dark river waters or in the many connected floodplain lakes. The Lower Wisconsin Riverway provides a safe haven for rare and unusual species at a time when researchers are discovering alarming declines in the numbers of fish species and other aquatic organisms around Wisconsin



Biologists walk out as deep as their waders allow hauling weighted seines with floating tops to collect samples of fish and other aquatic life in the river's marshes, bays and backwaters. Shallow waters provide nursery and sanctuary to many rare species.



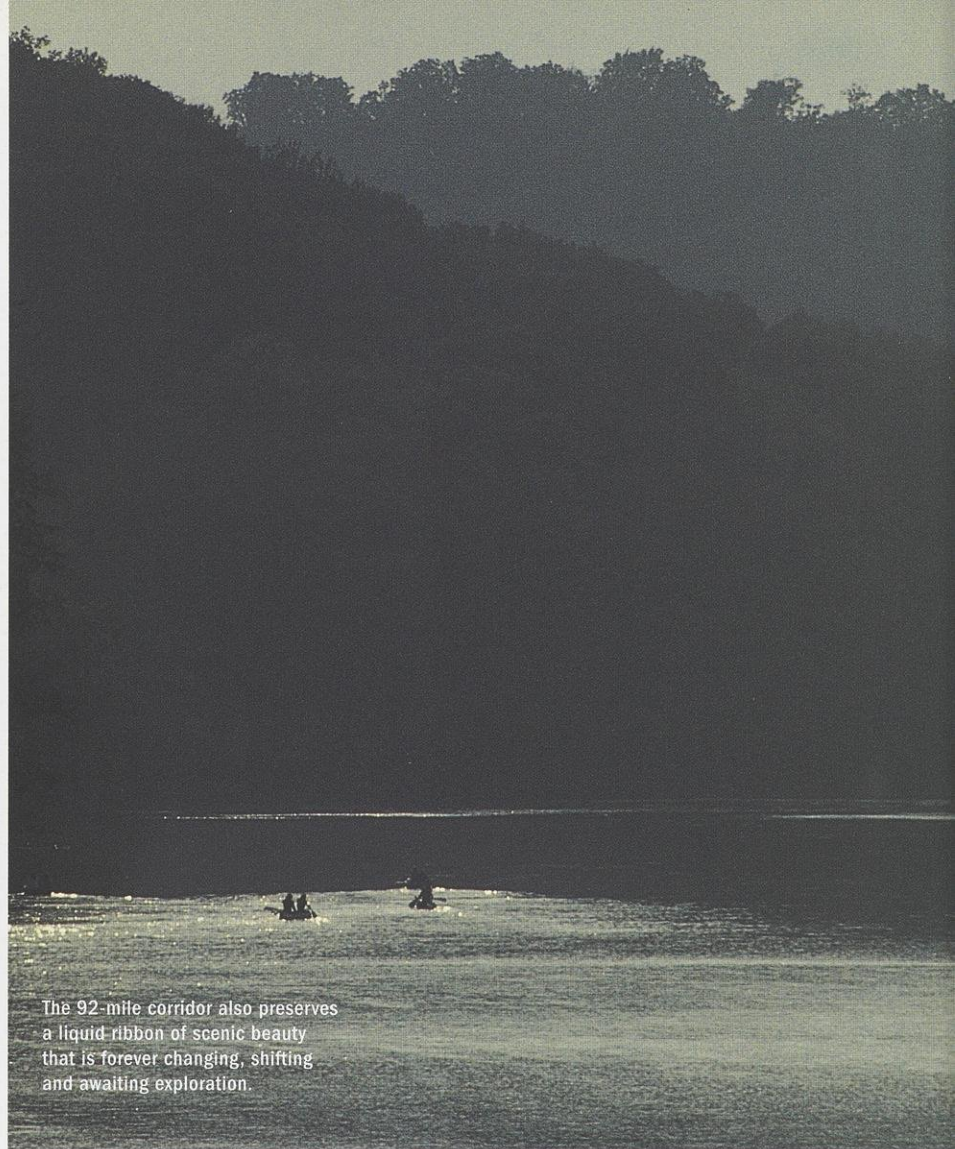
The Lower Reach is among the least disturbed parts of the Wisconsin River, says DNR biologist Dave Marshall. It's one of the highest quality warmwater areas in the nation. The diversity of fish found here is sustained by riverine habitats that would have been destroyed if this section of the river had been dammed.

lake and riverine fish populations. Over the last few years, I have tried to build on the state's knowledge base of Lower Wisconsin Riverway fishes by sampling the off-channel floodplain lakes and sloughs. Two or three days at the end of each summer, we sample several of these backwater lakes; some that have not been sampled in decades while others have no sampling records. Using small-mesh seines and towed electroshocking gear, we find surprising populations of state-endangered starhead topminnow within the blankets of aquatic plants and woody snags. Other small rare species are frequently found, including least darters, pirate perch, mud darters and lake chubsuckers. These species simply don't survive in waterways with shores altered by development.

"Many of the rare fishes inhabiting both the main river channel and backwater sloughs are on the northern edge of their range where evolution is occurring," Lyons says. "We have a moral obligation to ensure our actions do not destroy these unique biological treasures so future generations can enjoy them. These 'invisible' fishes are generally off the public sonar screen but tell us important lessons about habitat and water quality. Habitat-sensitive species are usually the first casualty of highly manicured fussy shorelines, but they foreshadow declining gamefish growth rates and numbers."

Living in close association with fish are numerous mussel species found in the Lower Wisconsin. DNR Fisheries and Freshwater Mussel Biologist Kurt Welke fires off a litany of mussel names like monkeyface, black sandshell and round pigtoe that frequent the Lower Reach.

"At least 10 state-threatened or endangered mussels are found in the Lower Wisconsin River," he says. "Their existence depends on the presence of specific fish hosts that complete their life cycle. The relative high diversity of mussels is directly linked to high fish diversity, and ultimately to the high-quality riverine habitat found in the Lower Reach." When mussels lay eggs, the small worm-like larvae that develop attach to the gills of specific fish species. Mussels are completely re-



The 92-mile corridor also preserves a liquid ribbon of scenic beauty that is forever changing, shifting and awaiting exploration.

liant on those fish to carry and deposit their larvae so mussel populations can grow in new areas. The fish-mussel association is just one example underscoring the importance of biodiversity, and how the loss or decline of a single species can have cascading effects on others.

In addition to fish and mussels, the Lower Wisconsin River hosts numerous rare mayflies and other aquatic insects. William Hilsenhoff, former University of Wisconsin aquatic entomology professor, described the Lower Wisconsin River as a "refugium for unusual and rare insects." His description could aptly apply to other animal groups, including mussels, fish and turtles.

The value of a wild river

The future of the Wisconsin River was not always bright. By the early 1970s, poorly treated wastewater from paper


mills and sewage treatment plants in northern and central Wisconsin released more than 500,000 pounds of pollutants into the upper river each day. Large sections of the river were devoid of oxygen and fish. At times the river appeared more solid than liquid: dense clouds of paper fibers and rafts of fungi and bacteria, the "sewage slime growths" that thrive in severe pollution, choked its waters. Without witnessing the degraded conditions firsthand it is difficult to imagine just how polluted the upper Wisconsin River was. The federal Clean Water Act and state environmental protection programs came to the rescue. By the early 1980s, 95 percent of the pollution was reduced and the upper river greatly improved.

The Lower Wisconsin escaped the severe water quality problems the upper reaches experienced due to its remote location from industrial pollution sources. The Lower Wisconsin did ulti-

mately benefit from the water pollution controls upstream, and improved water quality downstream was one of the main reasons recreational use of the river increased.

“As humans, we have the means to destroy or preserve this unique ecosystem,” Lyons says. Thanks to these combined efforts — the Clean Water Act, Public Trust Doctrine, public lands management, and the Lower Wisconsin Riverway Board, the Lower Wisconsin Riverway and its biological diversity have been preserved so far. This stretch of river, in addition to offering important recreational opportunities, will continue to provide a vital link to Wisconsin’s biological heritage — and serve as a benchmark for efforts to protect and restore other rivers.

A new fund may also help. An anonymous gift of \$25,000 to the Natural Resources Foundation of Wisconsin will establish an endowed Lower Wisconsin State Riverway Fund. Proceeds will support habitat management and restoration in the six counties along the Lower Wisconsin River.

Well after midnight that evening last September, Chuck and I headed back downstream as the others retired for the night on the sandbar. Navigating the river at night is indeed an adventure. Even the bright moon did little to help our visibility as mist rolled off the water and the river gave up its heat to the cold night air. As we carefully moved downstream, I thought about the growing popularity of places like the Boundary Waters and the Sylvania Tract as northern and rural Wisconsin become more developed. The Lower Wisconsin River may lack in remoteness from civilization, part of the allure of these other places, but the river makes up for its nearby location with a rich diversity of fish and other organisms the northern climates can’t support. Just a short distance from southern Wisconsin towns and cities, in the midst of bigger “attractions,” the Lower Wisconsin State Riverway remains a slice of wilderness and adventure within tamer surroundings. 

Dave Marshall is a fisheries biologist stationed at DNR’s South Central headquarters in Fitchburg.



RIVERINE FISH

Blue sucker (*Cycoreus elongatus*): With its exotic bluish color and oddly shaped snout, few people would recognize it as a native Wisconsin fish. Blue suckers dwell within deep swift river channels and keep their love lives secret. (~24”)



Paddlefish (*Polyodon spathula*): Once erroneously classified as a shark species, this primitive scaleless species reaches lengths of six feet or more. While sharklike in appearance, it harmlessly feeds on microscopic plankton. This huge protected species offers quite a surprise to anglers when accidentally snagged.



Mooneye (*Hiodon tergisus*): Its name aptly describes the unusually large eyes. This big river fish is relatively secure in the Lower Wisconsin River, but it is endangered in other states and its range has been shrinking. (~11”)



Western sand darter (*Ammocrypta clara*): In the same family with yellow perch and walleyes, this small bottom dweller is well suited to the broad sand flats in the Lower Wisconsin River. The western sand darter escapes predators by diving into the sand. While photographing an individual in a small aquarium, I thought it had jumped from the tank, but later found it submerged in the sand, its iridescent body pressed against the glass. (~2”)

FLOODPLAIN LAKE FISH



Pirate perch (*Aphredoderus sayanus*): The Latin name means “excrement throat” for the unusual location of its vent. An interesting but rare species inhabiting oxbows and off-channel floodplain habitats. (3 – 4”)



Weed shiner (*Notropis texanus*): Member of the Cyprinidae, the largest fish family in the state, weed shiners like many Wisconsin River fishes reach their northern limit of distribution in Wisconsin. (~2”)



Lake chubsucker (*Erimyzon succetta*): Juvenile shown. Shares the same family with the blue sucker but lives in much quieter lakes and sloughs. Considered quite tolerant of low dissolved oxygen, lake chubsuckers may be more vulnerable to habitat destruction. (adults ~7.5”)



American grass pickerel (*Esox americanus*): Smallest member of the pike family and frequent inhabitant of weedy bays, just like its bigger cousin the northern pike. (~8”)



Warmouth sunfish (*Lepomis gulosus*): This handsomely colored member of the sunfish family is often commonly found within the blankets of aquatic vegetation along with American grass pickerel, starhead topminnow and least darter. (3.5 – 5”)



Cindy M. Hale, forest ecologist at the University of Minnesota-Duluth, studies how different species of earthworms may change the soil structure and forest floor vegetation in different types of hardwood forests.

UNIVERSITY OF MINNESOTA

Worming into new



Inch by inch, earthworms are gaining ground in the Northwoods — where they are not naturally found.



Science teachers and citizen volunteers from environmental learning centers can receive training to recognize 15 earthworm species that are found in northern hardwood forests.

UNIVERSITY OF MINNESOTA

Sophia Estante

Back in 1996, biologist Cindy Hale took a field trip to the Chippewa National Forest in north-central Minnesota to examine forest floor litter, lift a few decaying logs and look for a few creepy crawlers in a clump of forest dirt.

territory

What Hale and the other plant ecologists and biologists saw surprised them. Normally the ground in these forests has a lush understory of green plants and a thick, soft layer of duff. Here, the ground was somewhat harder; in places it was stripped of low-growing plants and tree seedlings.

The damage hadn't been brought about by grazing deer or fire. To the surprise of all, it was a consequence of exotic invaders — earthworms. "Imagine!" Hale said. "It never occurred to us that worms might be exotic."

"Exotic" is a loaded word, especially when applied to organisms Midwesterners consider among the most common of critters, friends to farmers and

gardeners alike. What could be less exotic than the earthworm? But Hale and a number of other scientists are correct: Earthworms are not a natural part of the native fauna in large portions of the upper Midwest and Canada. The earthworms dug up in northern Wisconsin arrived only through human introduction.

One of the greatest misconceptions about earthworms, according to Lee Frelich, director of the University of Minnesota Center for Hardwood Ecology, is that they are native in northern hardwood forests. "This is not true in northern Wisconsin, Upper Michigan and all of Minnesota," he said. "All of the earthworm species in those areas are European in origin and arrived with European settlement."

Scientists are finding that, like other exotic species, earthworms may negatively change the environment. "In sites



Cindy Hale (right) and colleagues at the Center for Hardwood Ecology developed a curriculum and a program, Minnesota Worm Watch, to train and enlist volunteers to survey different kinds of hardwood forest floors for signs of earthworm disturbance.

UNIVERSITY OF MINNESOTA

Competing with Ice Age fungi

About 10,000 years ago, the glacial ice sheets spread over northern portions of North America started to recede, leaving behind boulders, sand and glacial till. In the warmer environment, hardwood forests flourished. Nature's decomposers in the forested areas were fungi and bacteria, which built layers of moist, fine roots just under the soil surface. Scientists want to know how other organisms like earthworms can change that forest community. According to Gundale, earthworms compete with some of the fungi nearly all plant species in deciduous forests need to absorb nutrients from the soil. Moreover, different earthworm species specialize in mixing soil at the surface or wiggling between shallow soil and deeper layers.

Organisms quite beneficial in one location can be destructive in another, Hale explained. This may be the case with earthworms, which are still valuable additions in gardens and compost bins across Wisconsin and Minnesota, turning refuse into nutrient-rich soil and aerating plots of agricultural land. Let out of the garden and into the northern hardwood forests, earthworms slowly spread and strip patches of lush foliage from the forest floor. Where the low plants and duff layers give way to bare soil, Hale and her colleagues find higher worm concentrations. The worms change how nutrients cycle through forest soils, and they change the structure and composition of subsoil.

that have been invaded by earthworms for a long time, you can end up with bad erosion problems," Hale said. For years, scientists have observed environmental changes, particularly to pockets of the forest floor, but they were attributed to browsers and grazers like deer, not earthworms.

"It's clear that earthworms alter plant communities," said Michael Gundale, a doctoral candidate from the University of Montana who has published on the topic of earthworm invasion. "The more complex issue is how they alter these plant communities." Gun-

dale said one possibility is that invasive earthworms change the forest floor (the decomposing layer of leaf litter on the soil surface) and the first few inches of duff (the loose, moist roots and fine soil) by both consuming it and mixing it into the underlying soil, leaving a trail of gummy worm castings. The litter layer is important for both plant life and animal life, particularly for rare fern species like the goblin fern, which completes its entire lifecycle in the litter layer, and for salamanders and small creatures that burrow and find shelter in soft soil.

People move worms farther and faster than they spread naturally

All gardeners take note: Moving soil and transplanting plants or trees can introduce non-native species by moving worms much farther than they would spread naturally during the year. People should only introduce worms in plantings where worms are already present, or in compost piles where the worms will not survive outside the pile, said Andy Holdsworth, a scientist in disturbance ecology at the University of Minnesota.

"City gardeners need not be too con-



Earthworms spread slowly through a forest, only 15-20 feet per year, but the researchers are concerned that combinations of earthworm species have the potential to slowly reduce shrub layers, herbaceous plants, leaf litter layer and subsoil from a healthy mix (shown at left) to a less complex mix shown at right.

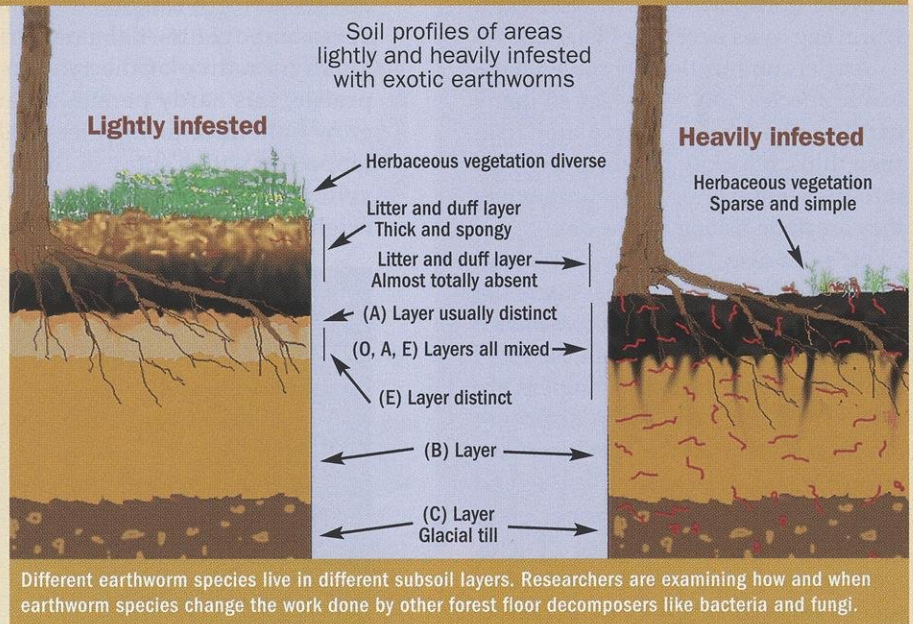
UNIVERSITY OF MINNESOTA

cerned, but people who garden in newly developed areas or at their cabins in the Northwoods should do their best to avoid accidentally introducing earthworms with plants or soil," he said.

Terrestrial ecologists in Wisconsin note earthworms are native to the farmlands, savanna and prairie lands in southern Wisconsin, but there is little research to determine which worms were native in formerly glaciated areas.

"Given limited resources and other more pressing research questions, we're not evaluating earthworms as an exotic species, and we're not aware of other similar projects among Midwestern researchers other than these few projects in Minnesota," said Karl Martin, DNR forest ecologist. Martin was aware that Holdsworth has begun examining a few sites in western Wisconsin.

After her pivotal experience in 1996, Hale set out to study the effect of earthworms on sugar maple hardwood forests in Minnesota. She is beginning to study other types of forests as well, such as beech hardwood forests. "Each type of hardwood forest is different," she said. "What's true for one type of forest may not hold true for another type. There may not be the same types of problems in different



STEVE MORTENSEN, LEECH LAKE DEPT. OF RESOURCE MANAGEMENT

types of forests."

Although earthworms are found in many areas, different species may be found in each location, and forests showing pockets of worm invasion where the soil and ground cover is bare in some areas may be fine just 50 feet away, given that worms spread slowly over many years.

More than 100 earthworm species have been identified, and 15 species are commonly found in the Midwest and Canada. Some live in the leaf litter

layer, some dwell in the top soil layers and some, like night crawlers (*Lumbricus terrestris*) burrow deeper into subsoil layers. It's relatively easy to distinguish earthworm species by their size, length, color and distance from the tip of the "nose" to the collar (clitellum).

How to halt the squiggling hordes

There are still a lot of things scientists don't know about earthworms. "Right


now — this research is in its very early stages — we are looking at why some plants make it after earthworms invade an area and why others don't," Hale said. "One possibility is that the plants are receiving a double hit — they are hit by both earthworms and by grazing deer. So one possible way of controlling the damage earthworms do would be to control deer populations. But we don't know yet."

Hale and her colleagues are also investigating whether or not an infested area can recover after an earthworm invasion: "We want to know, after the worms are there, is there anything that can be done?"

While scientists are searching for answers, anglers, gardeners and landscapers can do their part to help the cause by acting with more caution. Gardeners and landscapers should get their leaf litter, mulches, soil and root stocks locally to avoid transporting earthworms and worm egg cases over long distances.

Anglers unintentionally spread these exotic species, too. Many see so many earthworms for sale where they fish, they think it's okay to dump live bait into the waters or on shorelines when they are done fishing for the day.

"It's not okay," Hale says. "We find more earthworm species near the shores where people fish [in some hardwood forests]. That's where the most destruction takes place." Anglers are asked to be as careful when disposing of unused worms as they are when disposing of unused minnows, leeches and other live fish baits. The proper place for disposal is in the trash.

Hale encourages people to be aware where earthworms may be invasive, take steps to limit their spread, and join in the research to help map where the worms' ranges are spreading. Residents in Minnesota and adjoining areas of northern Wisconsin can help researchers collect data about earthworms through a Worm Watch program, which is also monitoring areas in Canada. To learn more about earthworms and Project Worm Watch, visit www.nrri.umn.edu/worms. 

Sophia Estante is a freelance writer from Madison.

Let the cup be unbroken

Continued from page 2

He pointed out where cup plants, whose cheerful, sunflower yellow blossoms can bloom well into September, were felled and wilting. He showed me how their leaves form cups where birds and butterflies often come for a drink. Hummingbirds regularly visit and in fall, goldfinches could have enjoyed the seeds.

I later read that cup plants, or *Silphium perfoliatum*, are prairie forbs in the *Asteraceae* family—a sunflower closely related to the compass plant. Also called Indian cup, ragged cup and carpenter weed, they flourish from Michigan across to North Dakota, down to Texas and over to Alabama. Originally a native of the tallgrass prairie, this hardy perennial can grow from three to eight feet high topped off with a spray of cheery-yellow, daisy-like flowers. My neighbor explained that even after

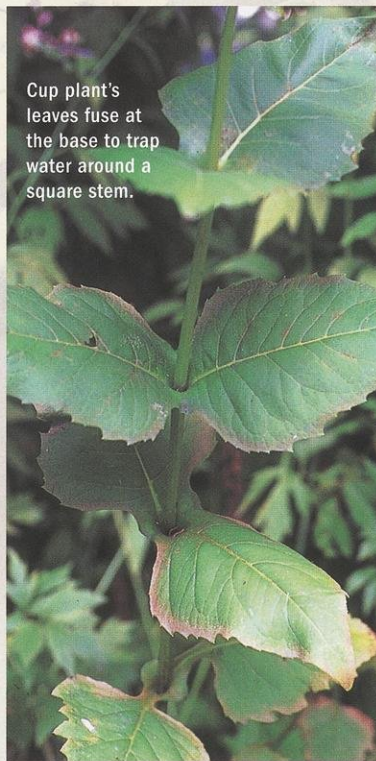
white lilacs have browned and purple thistles have puffed away their heads, cup flowers will brighten the hot and humid hearts of our Midwestern summers. Like a cherished antique teacup, they endure and serve.

The plant's intriguing arrangement of the opposing leaves provides its moniker. Riding opposite each other on a squarish stem, large, coarse-textured leaves fuse together at their base to form generous, funnel-like cups. There, morning dew can collect even on the hottest summer days offering moisture to birds and insects.

"They actually can hold rainwater," my elderly neighbor said as he lifted a felled cup plant stem to show me. What's neat is they actually form their own microclimate. Many years ago, folks settling the prairies and woodlands considered them a welcome sign...a living message that things could grow, and thrive there. It's a sad irony that the colors mowed down on that quiet roadside are seen by too few people as a sign of this giving, growing season; a simple message that we should just let summer be summer.

Consider this broken cup image as inspiration for natural landscaping. Diplomatically share your concerns about roadside natural habitat with government officials, neighbors, school and civic groups. Suggest a more nature-friendly kind of landscaping and a gentler style of maintenance. See cup plant as a signal that the generous habitats of roadsides, farms and woodlands can flourish if we know what to do, what not to do, and how to help others to do the same. 

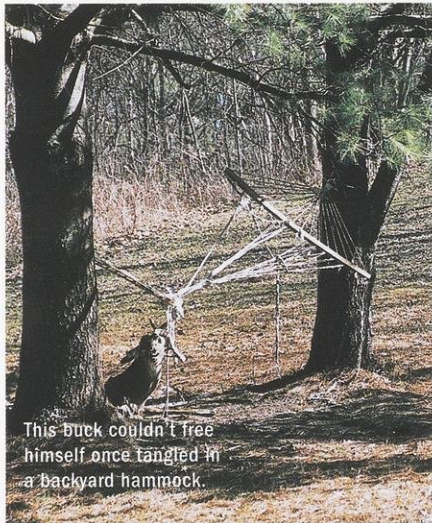
Lynn Kuhns writes from Winneconne.



LYNN KUHN'S

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



This buck couldn't free himself once tangled in a backyard hammock.

BY RICK FOURNIER

WILDLIFE THREAT

Although our seasonal-cabin neighbors were probably aware that manmade objects could pose a threat to wildlife, they were shocked when we called to inform them that something as innocent as their hammock, left strung up between two white pines, could lead to the death of a strong, six-point buck.

It appears the deer died of either strangulation or exhaustion after a struggle so fierce that it tore out an antler. Other animals took advantage of the situation to feed on his carcass.

Although we have no shortage of deer in Polk County, it's still sad to see such a sight and imagine the terror this animal must have experienced in its struggle for survival.

We hope you can warn others of how easily a piece of outdoor equipment can become a potential death trap for animals and birds.

Rick and Katie Fournier
Minneapolis, Minn.

TROUT FISHING ENTHUSIAST

The April 2005 issue was great. In particular, Judy Nugent did an outstanding job in writing "Coulee trout." Use her talents again for us trout fishing enthusiasts.

I have a cottage in Marquette County and have fished trout in both Marquette and Waushara counties since 1971 and have caught my share of browns. Her article almost put one on the trout stream.

Your other article, "River on the rebound," concerning the Milwaukee River was most interesting and revealing.

Harold W. Moilanen
Glendale

MILWAUKEE RIVER COLLABORATION

I was delighted to see the Milwaukee River featured in the April 2005 issue ("River on the rebound"). As it happens, a group of partners has been meeting over the past year to develop a collaborative vision for conservation, restoration and recreation in the upper Milwaukee River basin. These partners have all been engaged in one way or another in preserving the upper watershed of the river, and felt that by combining efforts and developing complementary projects we would be even more effective in ensuring the health and vitality of the river as a whole. Thanks for highlighting this fantastic river recovery story!

Karen Bassler
Gathering Waters Conservancy
Madison

CLEAN AIR TESTIMONIAL

Wisconsin is the prettiest of all the states where I have traveled. When I arrived and stepped out the airport door, I took the biggest breath of fresh air I've ever had before. I will always remember it.

Susan McConaghy
Satsuma, Ala.

GARLIC MUSTARD DELICACIES

Despite recommendations for its eradication, I see that garlic mustard is flourishing! On my spring walks I have broken off and tried a few leaves. I found the flavor very interesting; a little like watercress. Perhaps encouraging "over-harvest" with recipes and nutritional information while discouraging any thoughts of cultivation might help control it.

Al Corlett
Lake Mills

Your idea has merit with invasive plant specialists. In fact the Invasive Plants Association of Wisconsin (IPAW) has issued a "Call for Recipes" on their website (www.ipaw.org/recipes.htm), asking for recipes that use invasive plant and animal species. Entries will be posted on the Weeds Gone Wild website (www.nps.gov/plants/alien) and click on "Eat Your Weedies". When using garlic mustard for cooking, it's best to pull the entire plant early in the season before it flowers. Remove the roots from the area so they don't re-establish themselves. Once it has flowered, be very careful not to spread the seeds to un-infested areas by cleaning shoes, pant cuffs, tires and any other items that have come in contact with the plants.

CATALPA WORM BAIT

I was just surfing the web about catalpa worms and ran across your site. Thanks!

Walter Burns
San Augustine, Texas

With fishing season in full swing, we invite readers to take a look at "Angling for wigglers, worms and hoppers," (June 1997) for tips on baits that could help land the fish of your dreams. The story reveals that the catalpa worm, the larva of the sphinx moth, is legendary among baits. To use it as bait, you'll need to cut the worm in half, turn it inside out and thread it on your hook. The scent attracts fish, particularly panfish and catfish. The story is available on our website (www.wnrmag.com) and click on Search, 1997) or can be purchased as a back issue for \$3.00, plus postage and handling. Send a check for \$4.50 payable to Wisconsin Natural Resources, P.O. Box 7921, Madison, WI 53707.

DISRESPECT FOR PINE ISLAND

What has happened to Pine Island?

Having been raised by parents who taught me to respect other people and all things around me, I have always taken pride in our state of Wisconsin. There are so many areas to hunt, fish, hike or just walk the trails anywhere in our state. I was introduced to the Pine Island area when I was 20 years old. (I'm 46 now.) I have used this recreation area to hunt white-tailed deer, turkeys, pheasants and other small game since then.

Last weekend I was fishing for walleyes on the Wisconsin River with my family

when we decided to take a midday break and I thought we should drive to the Pine Island area. I wanted to show my sister and brother-in-law the area that I have enjoyed for all these years. I explained the Aldo Leopold Refuge and how it benefits nature and the people that enjoy nature. Then we drove down the narrow dirt road that I used for years to get to my best hunting spot.

This small dirt road has turned into someone's personal dump. Plastic garbage bags, empty beer cartons, TVs, other furniture and, worst of all, deer carcasses were left rotting right in the parking lot. I was embarrassed to tell my family that I hunt this area. We then drove east on Levee Road to an area that overlooks the Wisconsin River. Same thing. The area was used for a dumping ground for someone who was too lazy to take their garbage to the proper recycling areas.

Who is responsible for keeping this area clean? Drive down Levee Road and you'll see garbage and litter spewed all along the roadsides. Do the residents of this area approve of the garbage? There are homes along Levee Road, and you can see litter everywhere. What would Aldo Leopold say if he were alive to see the condition of an area he dedicated for preservation?

Michael J. Wessinger
Milwaukee

Pat Kaiser, DNR wildlife biologist in Columbia County, explains that DNR wildlife management staff statewide oversee 215 wildlife areas comprising 467,260 acres as part of their duties. Another 120,000 acres are leased and managed for public hunting and recreation. Their duties concentrate on improving habitat conditions on these sites to encourage and sustain wildlife populations as well as provide a wide range of wildlife for both hunting and

viewing pleasure. As time and budget allow, duties also include maintaining the roadways, parking lots and trails leading into these properties.

Unfortunately, some people view these rural properties as convenient places to discard their trash and dispose of larger items that ought to be recycled or transported to landfills, says Kaiser. "One might expect the occasional pop can or beer bottle from joy riders along these roads, but Mr. Weissinger is correct that some people have used these remote roads as dumping grounds for larger items and bags of household trash."

As budgets continue to get tighter, wildlife managers have less money and time available to hire the part-time staff who formerly built time in their weekly and monthly schedules to empty garbage cans at wildlife area parking lots, pick up trash discarded on access roads and haul away broken appliances left along these roadsides, which are also patrolled less frequently in tight times. Wildlife management staff welcome cooperation from community service groups, other volunteers and property neighbors who are willing to pitch-in and keep an eye on these parking lots and roadsides.

UPDATES

SECOND MONITORING CONFERENCE

Citizen volunteers will learn about new opportunities for their efforts, how data they collect is used and how to write grant applications at the 2005 Citizen-Based Monitoring Network Conference to be held October 21-22, 2005, at Camp Jorn, Manitowish Waters. Camp Jorn is located on the eastern shore of Rest Lake just east of Manitowish Waters in Vilas County. From Highway 51, take Highway W

about two miles, turn right on Highway K, go one mile and turn right on Red Feather Road. Look for the Camp Jorn sign on the right. A small registration fee will be charged this year. Register on the group's website at <http://atriweb.info/cbm/conference/>.

RAILROAD-CAUSED FIRES

The insert about DNR's Firewise program ("Spreading Like Wildfire," April 2005) focused on how citizens can lessen the likelihood of fire damage to their homes in the wildland-urban interface. A series of 37 fires along a 15-mile stretch of railroad from Muscoda to Lone Rock in early May demonstrated just how quickly and easily fires can start under the right conditions.

A Wisconsin and Southern Railway train was stopped at Lone Rock after setting the fires that burned almost 100 acres. An inspection of the locomotive revealed that hot carbon particles from the diesel exhaust had caused the fires in the dry grass along the tracks. High temperatures and low humidity that day increased the fire risk. DNR fire control staff and local fire departments suppressed the fires before they reached the edge of a 3,000-acre pine and oak forest that includes over 275 homes.

POTTAWATOMIE LIGHT RELIT
May 10 was a landmark day for the Pottawatomie Lighthouse on Door County's Rock Island. After more than 40 years without a lens, a replica of the original Fresnel lens that once lit the lantern room was installed.

In the 1960s, the Coast Guard removed the original Fourth Order Fresnel lens and replaced it with an automated beacon attached to the lantern deck. The old lens, named after its 19th century French inventor, was crated up and stored in the basement. It was later determined to be missing and its whereabouts have remained a mystery.

With help from the Department of Natural Resources and funding from the Friends of Rock Island and a Department of Transportation matching grant, a Florida company manufactured a replica lens made of brass and hand-polished acrylic prisms. On May 10, the lens was carefully hoisted up the narrow tower and squeezed through the hatch opening into the lantern room. It now sits on a cast iron pedestal where it will be used as an interpretive tool when visitors tour the station. The public can view this optical gem every Monday through Saturday from 10 a.m. to 4 p.m. through Columbus Day. For more information, visit the Friends of Rock Island website, <http://fori.us>.



A shiny replica of a Fresnel lens is a sparkling jewel in the Rock Island lighthouse.

Tour de Fitchburg

It's a great feeling to ride off on a two-wheeled week-long trip under your own power. But what goes on before your feet hit the pedals isn't always so fantastic: There are heavy panniers to pack and carry, chains to grease, routes to chart, reservations to make, maps to crinkle and tear...by the time your cycling holiday begins, you need a break.

For once, check that DIY attitude at the door. Let someone else work out the details and hoist the portmanteau. All you have to do is ride and enjoy.

From September 18-23, Cycle Ventures International offers a guided spin through the rolling hills and picturesque valleys of southwestern Wisconsin on **Europe in Your Backyard II** — a five-night, six-day bike tour. Communities with German, Swiss, Cornish, Scandinavian, Irish, French and Italian heritage line the route, and at every stop cyclists can celebrate Wisconsin's rich ethnic European roots in architecture, language and cuisine.

Here are a few highlights of the trip: The first riding day of the tour begins in Fitchburg, rolls on through Paoli — a small, friendly community that's a favorite with cyclists — and ends in New Glarus (America's "Little Switzerland"). Riders can visit the New Glarus Brewery and the Huber Brewing Company in Monroe, to savor Old World European-style beers and ales. On following days the tour explores Wisconsin's early history in Mineral Point and enjoys a concert in Wisconsin's first opera house, takes in the fabulous fall vistas in and around Dodgeville, and skirts the high plateau of Iowa County, where Norwegian delicacies await at Little Norway.

The length of each day's route varies, from 25 to 55 miles per day. The leisurely pace allows the 125 riders the tour can accommodate to get acquainted along the way. All the routes have been ride-tested by the tour organizers, and each day riders will be given written directions with maps; no spoke-busting pot-hole or unexpected detour will

sneak up on you. If your equipment does let you down, experienced bicycle mechanics in a rolling bike shop and a multi-van SAG support system ensure no rider will be left behind. Make a purchase at shops en route? No problem. Concierge service will provide packing and shipping to anywhere in the world.

At night, you'll pull up to deluxe accommodations in cozy inns and family-owned hotels. Your luggage will magically appear in your room. You'll shower, relax, enjoy the local food specialties for dinner, sleep well — and arise the next morning refreshed and ready to ride on to

further adventures.

The best part of Europe in Your Backyard II: Proceeds benefit the Second Harvest Foodbank of Southern Wisconsin and the Madison Senior Center.

The \$850 fee includes lodging for five nights, five breakfasts, three dinners, a welcome reception, entertainment in New Glarus, Monroe, Mineral Point, Dodgeville, and a finale at Botham Vineyards & Winery in Barneveld.

For more details and to register, call Cycle Ventures International at 608/244-2432 or 800/546-8520, or visit www.cyclecvi.com on the web.

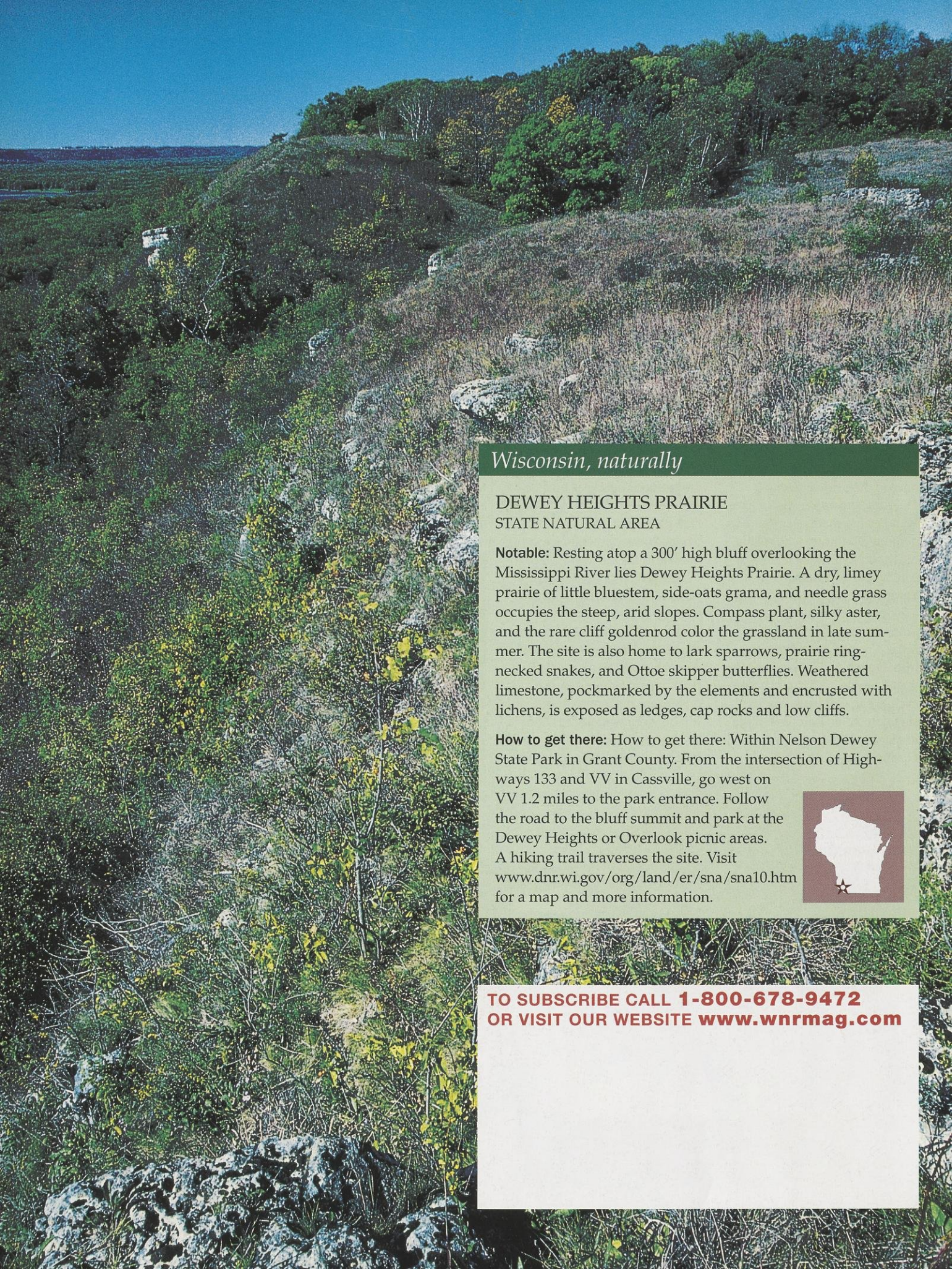


The Europe in Your Backyard tour helps food pantries and a senior center in southern Wisconsin.

Indulge yourself on an elegant adventure near home.



Say "MOOVE IT" in any language you choose.



Wisconsin, naturally

DEWEY HEIGHTS PRAIRIE STATE NATURAL AREA

Notable: Resting atop a 300' high bluff overlooking the Mississippi River lies Dewey Heights Prairie. A dry, limey prairie of little bluestem, side-oats grama, and needle grass occupies the steep, arid slopes. Compass plant, silky aster, and the rare cliff goldenrod color the grassland in late summer. The site is also home to lark sparrows, prairie ring-necked snakes, and Ottoe skipper butterflies. Weathered limestone, pockmarked by the elements and encrusted with lichens, is exposed as ledges, cap rocks and low cliffs.

How to get there: How to get there: Within Nelson Dewey State Park in Grant County. From the intersection of Highways 133 and VV in Cassville, go west on VV 1.2 miles to the park entrance. Follow the road to the bluff summit and park at the Dewey Heights or Overlook picnic areas. A hiking trail traverses the site. Visit www.dnr.wi.gov/org/land/er/sna/sna10.htm for a map and more information.



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