

WISCONSIN NATURAL RESOURCES

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Casting for common ground

Are largemouth bass replacing walleyes in some waters?

A plan for a broad landscape

How mussels get around

A tiny terror in a sandy pit



An unsuspecting ant slipped on the sloped sides of a conical hole, was pelted by sand grains, and then ambushed by an aggressive antlion.

© DWIGHT KUHN

The antlion uses engineering, dexterity and determination to ambush and attack its prey.

A barefoot stroll along a beach or over sand dunes is relaxing and the wide-open scape offers a broad view stretching to the horizon. On the other hand, if you looked down and paid attention, you just might see life and death struggles unfolding underfoot. Today, the small stuff warrants attention as well. Look closely and you might see small ants navigating the uneven “boulders” of sand grains, the “mountains” of a ripple in a dune, and a veritable redwood in a twig washed up on the shore.

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WISCONSIN NATURAL RESOURCES

June 2010
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ED CULHANE, Eau Claire

BACK COVER: The stained waters of Beaver Creek meander through Blueberry Trail State Natural Area in Juneau County.

© THOMAS A. MEYER, Wisconsin Department of Natural Resources

INSET: Golden-winged warbler.

DENNIS MALUEG

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 dnr.wi.gov/org/land/er/sna.

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Sustaining a fishery or fighting natural cha

Lisa Gaumnitz

Largemouth bass populations are slowly replacing walleye in some northwestern Wisconsin waters. As biologists determine the causes, can and should they take steps to restore walleye as the dominant fish in these waters?

Call it the case of the missing walleye. Ol' marble eyes, anglers' No. 1 target and the ultimate shore lunch, are disappearing from some lakes in northwestern Wisconsin.

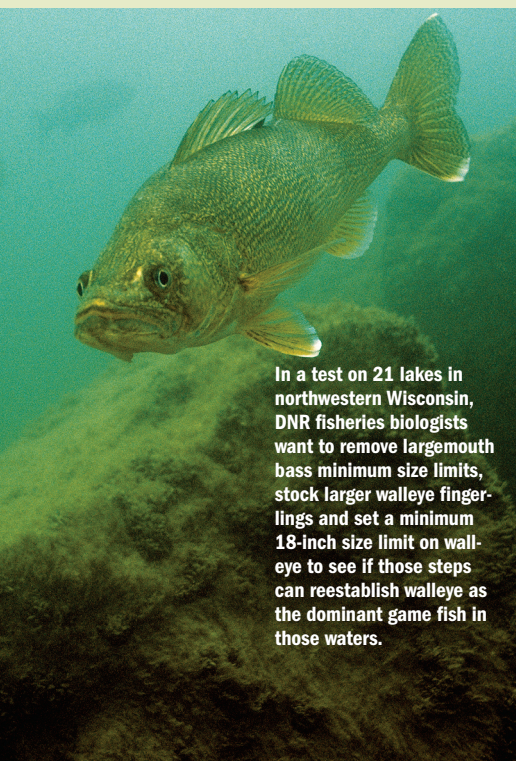
Adult walleye populations are dropping in these lakes and natural reproduction is sputtering. The stocking of small fingerling walleye, successful in the past, is netting next to nothing.

Frustration is setting-in in some communities where walleye has long been king of the creel and a top tourism draw that feeds the local economy.



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In a test on 21 lakes in northwestern Wisconsin, DNR fisheries biologists want to remove largemouth bass minimum size limits, stock larger walleye fingerlings and set a minimum 18-inch size limit on walleye to see if those steps can reestablish walleye as the dominant game fish in those waters.

"The number one complaint I hear from anglers locally is, "We want our walleye back," says Heath Benike, DNR fisheries biologist for Polk and Barron counties since 2003.

"We've tried increasing our walleye stocking rates and adding more walleye spawning habitat, and that did not help increase walleye survival or solve the existing problem."

Right now, the leading suspects are:

- **Largemouth bass.** Largemouths have been documented eating young walleye and populations of largemouth bass, opportunistic and voracious feeders, have soared as walleye have declined on these lakes. Cause or coincidence?
- **Climate change.** Northwestern Wisconsin has gotten warmer and its growing seasons have gotten longer



ROBERT QUEEN

Tournaments and fishing shows have convinced a lot of anglers to release the bass they catch, like this smallmouth. Biologists are asking fishers to harvest more largemouth bass on lakes where we're testing a range of strategies to more rapidly rebuild walleye fisheries.

over the last 50 years. Have these changes favored largemouth bass at walleyes' expense?

- **Lower lake levels.** Prolonged drought has left walleye spawning grounds high and dry on some lakes. Did plunging water levels sink a species whose reproductive success depends on having clean gravel or rock cobble along wild shorelines?
- **Clearer water.** Pollution control efforts and the drought have increased underwater visibility in many lakes. In clearer lakes, light-sensitive walleye must go deeper to be comfortable, reducing their overall habitat

and giving largemouth bass an advantage sight-feeding in the food-rich shallows.

- **Fishing regulations.** Have minimum harvest length regulations on bass worked too well? Has prohibiting bass harvest until late June in the Northern Bass Zone hurt more than it has helped?
- **Catch-and-release.** More anglers are releasing more bass to fight another day. Walleye are a different story. Has catch-and-release of largemouth bass become too much of a good thing?

Popular sentiment and some fish biologists finger largemouth bass as the leading suspect, but there's no smoking gun, says Steve Avelallemant, a DNR fisheries biologist in northern Wisconsin for the last 25 years and top fisheries supervisor in the region.

"There is no clear cause-and-effect relationship between the increase in bass and decline of walleye in waters where this relationship has been observed," he says. "It's likely that many factors contributed."

Studies are underway in Wisconsin and in Minnesota, where they're seeing similar trends in some waters, to help solve this walleye "whodunit." Wisconsin is trying to "flip" target waters back to walleye dominance while also

learning something about what contributes to their decline and which, if any, management approaches work best.

The Department of Natural Resources wants to test these ideas on 21 target lakes by removing bass size limits, stocking larger walleye, and protecting all walleye under 18 inches in order to more rapidly rebuild these fisheries, hoping the combination of tactics will work.

"We don't know if there are enough anglers out there who are willing to help by harvesting limits of largemouth bass, but we should be making it as easy as possible for anglers to do so," Benike says.

"If we can't get the harvest we need, at least I can say we tried to do our best to correct the situation on a select group of lakes, which is important to our local anglers and lake organizations."

Other biologists are concerned that removing size limits will only sacrifice the 10- to 14-inch bass now providing good fishing action for many anglers in those lakes with no guarantee that it will improve the walleye fishery.

Weighing the suspects: Are largemouths the bully on the block or just misunderstood?

Largemouth bass are found in all three drainage basins in Wisconsin — Lake Michigan, Mississippi River and Lake Superior. George Becker, author of the seminal work, *Fishes of Wisconsin*, and other fish experts have suggested that bucketmouths are here, especially in northern counties, because they were introduced to new waters.

Walleye got a helping hand as well. Originally confined to Wisconsin's larger lakes and waterways, extensive stocking of walleye fry and fingerlings over the last century spread the species widely across the state. Now, however, bass and walleye are on opposite trajectories in some waters.

Big Butternut and Ward lakes in Polk County are classic examples of how some northwestern Wisconsin waters have flipped from waters dominated by walleye to a sport fishery dominated by largemouth bass, Benike says.

Walleye were introduced into Ward Lake, a 92-acre seepage lake east of Luck, Wis., in 1934. Stocking stopped in 1954 because abundant natural reproduction was sustaining the fishery, he says. Twenty years ago, DNR electrofishing survey crews caught walleyes here at a rate of 160 per hour and largemouth bass at rates of less than 20 fish per hour. By 2000, the catch rate for

walleye decreased to 13 fish per hour while largemouth bass abundance increased to 133 fish per hour. Walleye natural reproduction is now absent, and stocking of small walleye fingerlings in 2003 and 2005 failed. Angler harvest isn't up significantly and tribal spearing has never occurred on Ward Lake.

Big Butternut Lake similarly saw walleye densities drop, from a high of about 4.7 fish per acre in 1990 to one fish per acre in 2003, as largemouth densities have steadily increased during this same time period, Benike says.

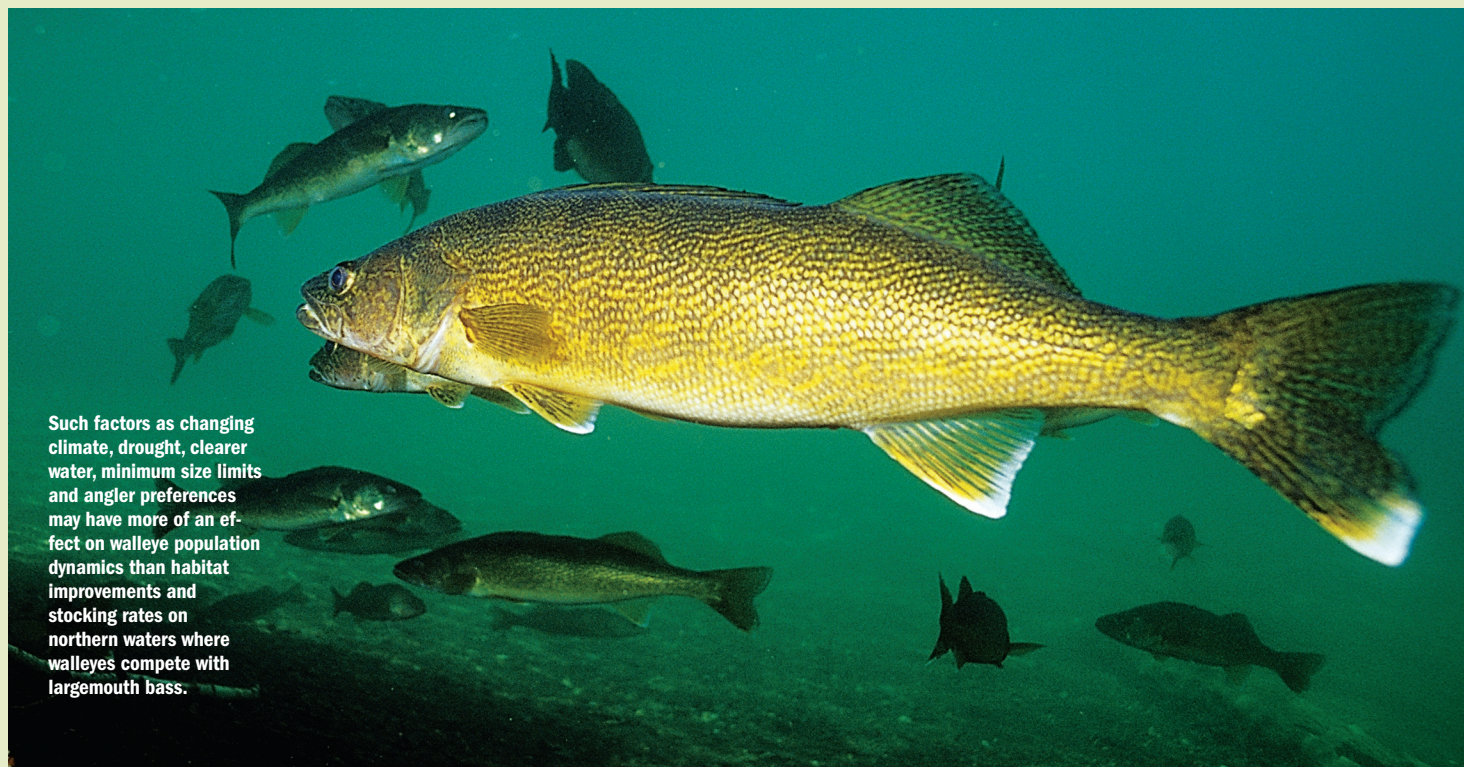
He thinks the 14-inch bass size limit is a major reason largemouth bass have become more abundant on local waters.

"Recent studies conducted on Wisconsin lakes suggest that walleye and largemouth bass can have negative interactions," he says. Most recently, DNR fisheries colleague Andy Fayram documented that largemouth bass were the only game fish to become more abundant at the same time managers noted significant declines in walleye populations. Smallmouth bass and other game fish populations show no such tendencies. Fayram also documented that largemouth bass affect the survival of stocked walleye. Several other studies throughout North America have docu-



JIM BISHOP

Raising walleye fingerlings to bigger size may help more of them survive predation and reach adult size when stocked in waters where they compete for habitat and food with largemouth bass.



Such factors as changing climate, drought, clearer water, minimum size limits and angler preferences may have more of an effect on walleye population dynamics than habitat improvements and stocking rates on northern waters where walleyes compete with largemouth bass.

mented poor survival of stocked walleye in lakes with good largemouth bass populations. And UW-Stevens Point fisheries researcher Nancy Nate found higher densities of largemouth bass and northern pike in lakes where walleye populations are maintained by stocking than in lakes where they are sustained by natural reproduction.

Past survey information and current population modeling suggest that smallmouth and largemouth bass were significantly less abundant before 1989 when the first minimum size limit was put in place. Growth rates of bass were somewhat faster then, but high angler harvest resulted in very few large fish. Other bass regulations such as reduced bag limits and the early catch-and-release season did not affect bass harvest as much as implementing the 14-inch minimum size limit.

"It's debatable if this is a cause-and-effect relationship or if it is driven by some other factors, however, there is enough evidence to suggest we should do something," Fayram says.

The hotter, the better — for largemouths

Fayram says his study is one piece of "fairly strong circumstantial evidence that when largemouth bass and walleye interact, the largemouth bass win."

Whether it's strong enough to tip a fishery is another matter.

"I found walleye in bass stomachs (during a study), but bass eat anything," he says. "So if there are walleye in the lake, they'll eat them. Do they eat enough to reduce the walleye population in the long run? That we don't know."

He favors the hypothesis that climate change creates conditions more conducive to bass at the same time anglers are releasing far more bass.

"It looks like climate change is a suspicious character in this whole thing," Fayram says.

UW-Madison climatologists who have analyzed weather data collected in the last 50 years have documented that the annual average temperature has risen by 1.1 degrees Fahrenheit statewide and average precipitation by about 10 percent. Most significantly, there are big differences across the

seasons and across geography. For example, temperatures have risen fastest in winter and spring, while summer and fall have actually cooled a bit. Winters in northwestern Wisconsin have warmed by as much as 4.5°F.

Northeastern Minnesota has seen similar climate changes and increases in bass populations. Don Pereira, fisheries research and policy manager for the Minnesota Department of Natural Resources, says that even small temperature increases can benefit bass, which prefer warmer water temperatures.

Warmer temperatures may mean that young-of-the-year fish can feed later in the year so that they are larger, are in better condition heading into winter, and survive in greater numbers.

"The dominant thesis is that longer growing seasons lead to higher survival rates for young fish," he says.

Pereira and colleague Mike McInerny caution that Minnesota has limited long-term data on smallies and largemouth bass, making it difficult to quantify the rate or magnitude of increase in bass populations. McInerny hopes to get a handle on that in coming years. He is in the early stages of looking at first-year growth rates in bass over the last 20 to 30 years.

For now, he is skeptical that bass are preying on walleye to any great degree.

"If bass are preying on young walleye, it has to occur during a relatively short period during the summer because age one and older walleye should be big enough to avoid predation by most bass," he says.

Pereira says Minnesota is putting together a plan to investigate causes and work on this issue.

Lower lake levels meet laissez-faire parenting

The drought in northern Wisconsin may be another factor contributing to declining walleye populations. Low water levels on some waters have left walleye spawning substrate high and dry, making spawning success even more tenuous than normal, Avelallemant says. At the same time, the lower lake levels can also spur weed growth in the lake, which favors bass.

Once female walleye deposit their

eggs and the eggs are fertilized, neither parent cares for the eggs nor the young fry. Weather can result in year-classes of walleye that can vary considerably from year to year.

Rapidly warming water can cause eggs to hatch early. Prolonged cool weather can delay and impair hatching. A cold snap after the hatch can suppress the production of microcrustaceans that walleye fry eat.

Bass reproductive success also depends a lot on the weather, but their parenting habits would appear to give their eggs and the resulting fry a better shot at making it to their first birthday.

Male bass guard the nest until the eggs hatch and mature into a swarm of fry. They strike at intruding fish but do not eat them — at least until the fry leave the nest upon growing to one inch. Then the bass start feeding again and may eat any young bass they encounter, including their own.

Is angler behavior the trump card?

John Lyons, a longtime DNR fisheries researcher and member of the statewide bass management team, believes that the strong catch-and-release ethic that's developed among bass anglers is a potential factor that tipped some lakes toward bass dominance.

"People keeping or not keeping fish has driven a lot of this and may be the single most important factor," he says.

The growing popularity of bass fishing tournaments over the last generation, and the catch-and-release practice promoted by those tournaments and by B.A.S.S. (the Bass Anglers Sportsman Society), have taken hold nationally and in Wisconsin.

Anglers reported harvesting only 5.46 percent of the 10 million bass they caught during the 2006-7 license year, according to a random, statewide mail survey. That's an even lower harvest rate than anglers reported for musky, 5.59 percent of the 223,101 caught.

Meanwhile, walleye are still turning up on anglers' plates at a much higher rate. The fish biologists rule out overharvest of walleye as a cause, noting that walleye harvests have not increased significantly in northwestern

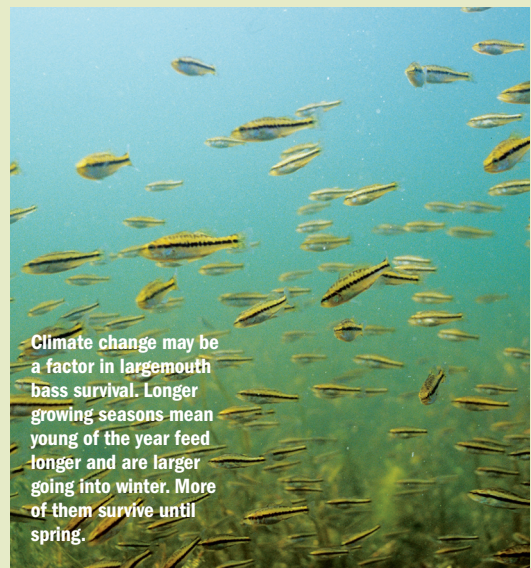
Wisconsin waters in recent decades and that such a trend would be quickly noticed. Walleye harvests are the most closely monitored harvests in the state under a 1983 federal court ruling that reaffirmed the Chippewa tribes' rights to hunt, fish and gather wild rice on lands they ceded to the federal government in treaties signed in 1837 and 1842.

Lyons says that changing the harvest dynamics raises social issues that DNR's fisheries program and anglers will need to grapple with.

"Some of the questions we need to engage are almost in the category of value judgments," he says. "Some lakes where walleye may be replaced by bass were marginal walleye lakes to begin

walleye populations. And there is consensus that the most effective tool for reducing bass abundance through angling will be to remove minimum length limits, Avelallemant says.

So, with concern mounting among some local biologists that time may be running out for some walleye lakes, the Department of Natural Resources asked anglers at the Spring Fish and Wildlife Rule Hearings April 12th to weigh in on a proposed three-part plan seeking to restore walleye populations on 21 lakes in Barron, Bayfield, Burnett, Polk, Rusk, Sawyer and Washburn counties. All of the lakes have been primarily managed for walleye, and each has had a walleye population sustained by



Climate change may be a factor in largemouth bass survival. Longer growing seasons mean young of the year feed longer and are larger going into winter. More of them survive until spring.



ROBERT QUEEN

Angler habits are an important factor in sustaining fisheries. Creel census surveys provide information on how many fish anglers catch and keep.

with," he says. "It may be we're fighting Mother Nature."

"There's also this idea that having lots of small to medium bass is a bad thing. But 11- and 12-inch fish are easier to catch and it's fun. The numbers of big fish aren't getting worse, it's just that now you catch 10 fish and one might be legal instead of in the old days, when you caught two fish and one would be legal."

"Where is the problem? We're complaining about something that's pretty good."

Seeking solutions

Despite differing takes on what's behind the walleye's demise and whether Wisconsin can actually flip the target lakes back to higher walleye populations, there's some consensus among biologists that largemouth bass preying on young walleye would hamper efforts to restore naturally reproducing



Voters at the Spring Hearings approved a test on selected northern Wisconsin waters to see if protecting younger walleye, stocking large fingerlings and removing minimum length limits on largemouth bass can restore walleye populations in lakes that traditionally provided excellent walleye fishing.

natural reproduction during the past 20 years.

The plan seeks to:

- Significantly reduce largemouth bass populations in order to minimize predation or competition with walleyes by removing length limits

for bass.

- Significantly reduce angler harvest of spawning-age and sub-adult walleyes in order to rebuild the spawning population. The minimum size limit for walleyes would increase from 15 to 18 inches and the

daily bag limit of walleye would drop from five to three fish.

- Monitor the walleye populations and stock larger walleyes.

Benike says those managing the study waters also hope that reducing bass abundance will cull some of the small, stunted fish from lakes with over-abundant bass and result in fewer but bigger bass. As bass populations on Half Moon Lake in Polk County grew, for example, bass tournaments became more popular on the lake. But now, with small fish abundant, tournament organizers are going elsewhere, Benike says.

David Butler, who's fished Half Moon Lake for the past 30 years, favors efforts to bring back the walleye. "I fish

tor of the Wisconsin Bass Federation, said his organization doesn't back regulation changes on those waters and feels that in the past the Department of Natural Resources has been pressured by some legislators, resort owners and lake associations to remove bass length limits.

"I feel that with the current scientific observations relating to climate change in our region, we need to study these issues and not change regulations that have improved black bass populations for the benefit of the general public over the last 30 years. The Wisconsin Bass Federation is in favor of good science playing the leading role in regulation change, not politically motivated agendas, anecdotal evidence or wishful thinking."

Benike says that one of the keys to helping the walleye recovery plan work is helping bass anglers understand that DNR fisheries biologists aren't trying to get rid of all the bass on all lakes, but only reduce bass populations on the 21 study lakes that have historically been managed for walleye.

"There are about 346 named lakes in my management area in Barron and Polk counties," Benike says. "We are going to leave things alone on 98 percent of the lakes but try something different on these two percent to see if we can learn something to better understand and manage the fishery that anglers prefer and desire."

More analysis before more regulation changes

Fayram, Lyons and Avelallemant, all members of an ad hoc team the DNR fisheries program has pulled together to work on the issue, hope the plan also helps biologists learn more about what is causing population shifts in the two species, including the effectiveness of stocking large walleye fingerlings. Such information will be critical for addressing future problems and helping the Department of Natural Resources allocate its shrinking resources in the best way.

And the findings that emerge from the walleye recovery plan are just the start of the research and discussions that are needed, they say.

"We have more work to do analyzing data and forming policies before


we can continue efforts to change bass populations through angling regulations," says Avelallemant.

Specifically, he says, we need to look further at:

- What bass fishing regulations might help decrease abundance but still keep good numbers of larger bass? Simply eliminating the minimum length limit may not be the best approach except in instances where we are trying to restore walleye dominance.
- What are the trade-offs in potentially eliminating the early catch-and-release season for bass? How much might an earlier season increase bass harvest to help reduce overall bass abundance? Has the catch-and-release season preserved larger bass and, if so, how much could be lost by eliminating it?
- Some biologists and anglers believe that separate regulations for largemouth bass and smallmouth bass angling are necessary to best manage bass populations. How often do both species occur in significant numbers in particular waters? Is the need to separate the two species significant enough to justify increased regulatory complexity? Should any species separation be considered broadly or only for specific waters?

DNR Fisheries Biologist Frank Pratt in Sawyer County is convinced that once walleye decline, if largemouth bass are waiting in the wings, walleye recovery is severely impeded and further management activities are warranted.

One thing that all seem to agree on, however, is that anglers hold the key in the walleye recovery plan. We need anglers' help, Fayram says. "We don't know if we have the capacity to flip it back or fight it in the target lakes," he says. "We don't know if anglers will keep enough bass to make a difference." One potential difficulty is that reducing fish populations a little can increase consumption by the remaining fish with every remaining fish growing faster and eating more.

"We just have to kick it, and kick it hard enough," he says. 

Lisa Gaumnitz is the public affairs manager for DNR's Water Division including the Fisheries and Habitat Program.



for walleye all the time, but catch nothing but largemouth bass. I didn't catch a walleye all year in 2009. The few large walleyes I have caught have been in deep water in the area of 30 feet where most people don't bother to fish."

The lake's protection and rehabilitation district recently voted to spend \$5,000 to buy walleye fingerlings.

Stephen Hjort, Conservation Direc-

We hiked down-stream, crossing the river three times, till we reached the mouth of a tributary, a lesser-known trout stream, and began fishing our way up. It was a meadow stream, snaking through a high-ridged valley. Foraging dairy cows watched us with sleepy indolence. Up ahead was a narrowing where swifter water dug a deeper pool, and we could see rising trout. We advanced in a semi-circle, angling away from the stream so the trout would not see us.

We made an odd couple — an outdoor writer in his 50s and a 16-year-old girl from Madison who'd never been fly-fishing — not that there was anyone around to notice.

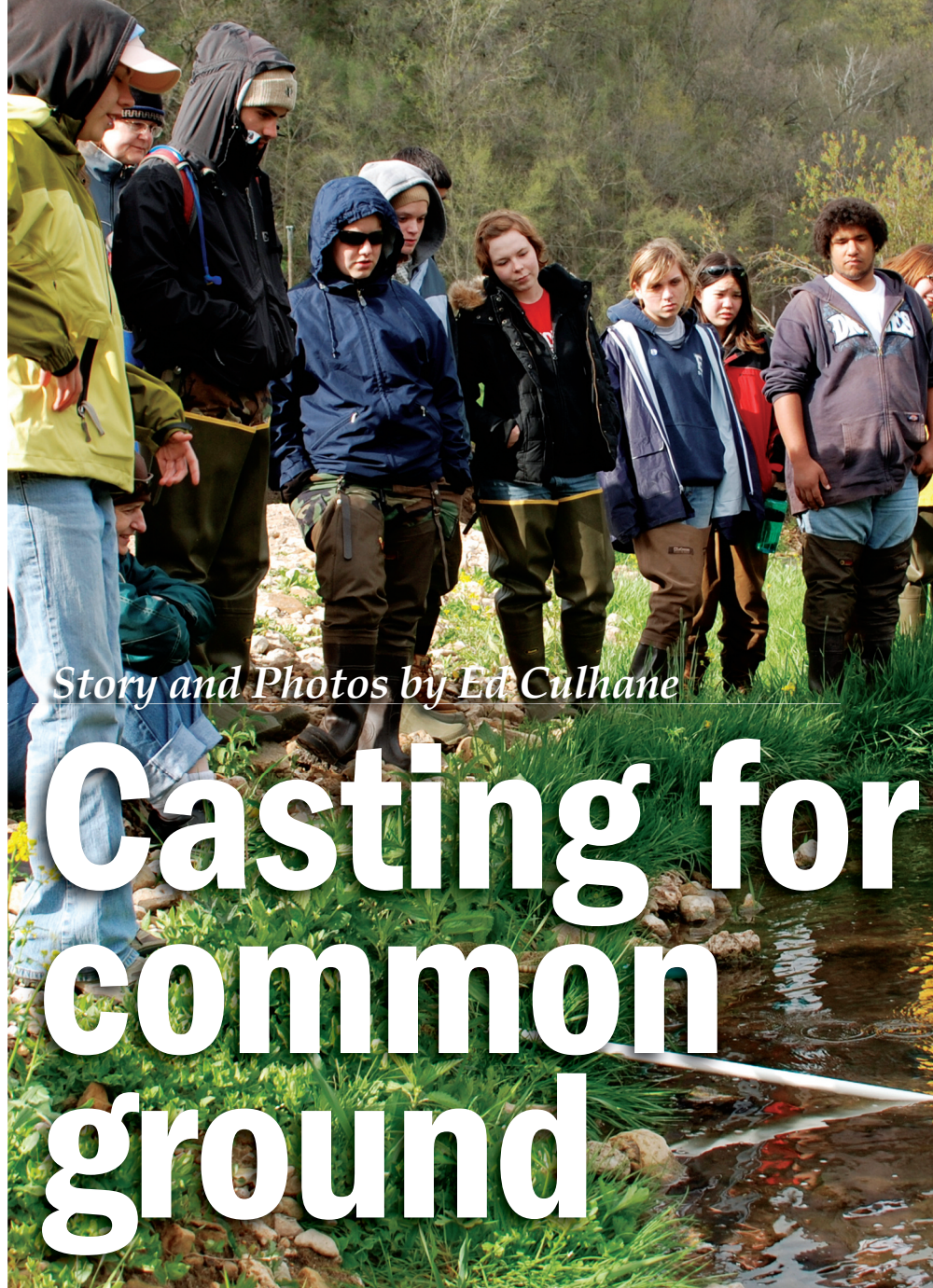
I hadn't planned on this. I'd been drafted as a guide at the last minute. Now, more than anything, I wanted this quiet girl beside me to catch a wild trout...

Headquarters

Base camp was at the Avalanche campground on the West Fork of the Kickapoo River in Vernon County. Three Madison teachers and their 17 Project Green Teen students from Malcolm Shabazz City High School had laid siege to the clubhouse.

They'd be here for seven days in early May, 2009, a colorful beachhead of youth and ethnic diversity in a campground normally and chiefly occupied by older white guys with whiskers and creaky knees — or in other words, people like me.

I'd been tracking the students for two days, taking photographs and notes. I'd come to understand that



something special was going on, something unexpected, something beyond the service projects and the cool stream-side classes led by scientists from the Wisconsin Department of Natural Resources.

So far, I'd reached one conclusion. Head teacher Tina Murray, who created this program six years ago, is some kind of wizard.

The idea came to her when she was off by herself, catching trout, absorbing the natural beauty around her. She thought of her students, inner city teenagers whose experiences were too narrow and limited to include something as esoteric as fly-fishing.

"I thought, wouldn't it be great if

the kids could experience this," Murray said. "It would add some peace and strength to their lives."

Somehow, through force of will, she convinced a whole bunch of people to volunteer their time and expertise to make it happen. In the end, she and her colleagues turned these beautiful spring creeks into the centerpiece of an ecology-based program so engaging and powerful it is transforming the lives of at-risk high school students.

"Society is too ready to dismiss these teenagers," Murray said. "There's this bizarre belief that after middle school you can't change them. These guys are idealistic, and after this program, they are committed."

Students and grizzled fly-fishers share the value of exploring, enjoying and improving conditions streamside.



DNR Ecologist Mike Miller shows Shabazz ecology students a host of different ways to measure a stream's health in the face of runoff, nutrients and other challenges.



The chance to get in the water, collect fish and look for aquatic bugs isn't just about learning, it's fun.

Project Green Teen is a second-semester option at Shabazz in which standard classes — English, social studies, math, science and health — are reworked as tools to understand stream ecology and the relationships between surface waters and the people who live, work and play around them. This week-long field trip is the culmination.

A morning's work

Early Saturday the school group gathered in an open field at Read's Creek Nursery outside the tiny hamlet of Readstown, greeted by volunteers



The student crews made quick work of building LUNKERS that will provide artificial streambank cover for fish.

from the Blackhawk Chapter of Trout Unlimited, stacks of oak blocks and planks, reinforcing steel rods, generators, power drills, sledge hammers and, best of all, nail guns.

They were divided into teams, and with coaching from the TU crew started to build large, crib-like LUNKER structures. These will be anchored below the water line into the outside banks of streams degraded by erosion. The LUNKER projects stabilize the banks creating shaded cover for trout.

Next came three, short concurrent sessions. In one, science teacher Robert Banks led forays into the woods in search of morels. In another, Jeff Hastings, national TU project manager for

the Driftless Area Restoration Effort, talked about stream rehabilitation and how a partnership between the DNR and TU has restored hundreds of miles of trout stream.

The third session was Blackhawk TU official Fred Young, CEO of a multi-million-dollar, high-tech engineering company, talking to the students about getting ahead in life. He's been hiring people for 45 years. He told them he screens for attendance. He is willing to invest in people who can be trusted to show up.

"The next thing I look for is attitude," he said. "What I am looking for is that in at least one of your subjects, you excelled at it. Grades are the last thing I care about. I am looking for a spark of creativity."

A different high school

Malcolm Shabazz is an alternative high school that draws students from the four public high schools in Madison. With an enrollment of about 130, it is designed for students who for one reason or another don't fit in at a mainstream high school. Some are unusually quiet. Others, more outwardly rebellious, display their nonconformity with tattoos, facial piercings or bright hair.

"I'm not a good test taker," said Julia Rowe. "I failed every test. I never did my homework. I didn't see the point in filling out worthless worksheets."

For some of these students Shabazz is not just an alternative, it's a lifeline.

"Shabazz is pretty much my savior," said Heidi Kelley.

There's a process for getting in. The student's family must be involved. Each prospective student spends one full day shadowing a Shabazz student. A committee decides who will get written invitations. Those not invited receive a written explanation.

"We don't have a lot of tests in our curriculum except in math and science," said Meghan Murphy. "We're all in the same class but not all at the same level. We help each other through whatever we are doing."

At Shabazz, the question is always asked: "What are you going to do about it?"

“Shabazz is community service based,” Emma Urbas said. “We take what we learn in the classroom and apply it in the outside world.”

In the Green Teen Program, which is composed of 17 to 20 students each year, they plant trees, remove invasive plants and pull rubbish out of stream-banks. “We work as a team,” Murphy said, “so we get to know each other really well.”

While the educators at Shabazz rely less on standardized tests and grades, preferring a pass-fail approach and written evaluations, they are running a fully accredited high school whose students take the same college entrance exams as everyone else. Three of every four Shabazz graduates enter college.

Before the year was out, Rowe had received a four-year scholarship in the environmental resources program at Northland College in Ashland. Urbas was accepted at the University of Wisconsin-Stevens Point where she will study water resource management.

Headwaters

Saturday afternoon finds the team in their waders perched on a rocky outcropping. A few feet to their right, the trout stream called Seas Branch surges from the hillside. This is the source, where groundwater bursts from the earth, cool and clear, and becomes one of the most beautiful things on earth – a trout stream.

Mike Miller, a DNR stream ecologist, faces the explorers from the opposite bank. The newborn Seas Branch foams into whitewater at their feet, running between teacher and students, dancing over moss covered rocks.

The students are learning how land use – development, farm practices, conservation, manure management — affects the stream. They learn how to measure the creek’s health. They take its temperature, measure levels of dissolved oxygen and determine its electrical conductivity.

Still, a rock that Miller takes out of the stream is covered with life forms – tiny crustaceans, caddis fly larvae inside casings made of twigs or pebbles, mayfly larvae, stonefly nymphs.

A short drive and class is recon-

vened a mile downstream. The Seas Branch has grown, fed by rivulets and springs. Now comes the fun part. Using a small fish shocker they briefly stun trout so they can be examined. That’s followed by screening creepy looking aquatic bugs out of river silt to be classified. Some water bugs are more sensitive to pollution than others. Their presence is an accurate barometer of stream health. Stoneflies, like cockroaches, we learn, were crawling around millions of years before there were trees.

Miller has been a Shabazz volunteer for four years, he told me at dinner.

“It is critically important that upcoming generations do a better job than the last,” he said.

Home cooking is best when it is shared

Food preparation is part of their education and everyone serves on cooking and cleanup crews. Teacher Martha Vasquez is helping them examine eating habits and options. They are reading *Fast Food Nation: The Dark Side of the All-American Meal*.

At dinner, students talk about their day.

“My favorite part was when we were in the stream, walking in the water,” Martha Price said. “I used to

think fish were kind of gross looking, but when I saw the brook trout – they were really pretty.”

Alex Wolfe liked using electricity to briefly shock trout, a technique used to study fish populations. And he liked the nail gun. With few exceptions, they all loved the nail gun.

“I felt like I was the most powerful person in the world with it,” Sarah Bortz said.

“We were just like machines,” Murphy said. “We got that done so fast and so effortlessly.”

Then Wolfe got to the heart of it.

“I know now that I really like being outside,” he said, “and I love nature.”

“No animals got hurt in the making of this film.”

Dave Vetrano, DNR fisheries team supervisor out of La Crosse, showed up Sunday morning with a beefed-up fish shocking operation in the persons of DNR fisheries technicians Kevin Mauel, Beth Stuhr and Jim Webster. Several large trout, suckers and a dogfish were captured and each species, in turn, was displayed for the students in a portable aquarium that sits on a pole. Then the fish were released unharmed.

“Form follows function,” Vetrano said, describing the functions of the



Students see for themselves that a lot of natural resources work is a hands-on mix of science and physical activity. Several are pursuing outdoor careers.

swim bladder, the lateral line, the general shape of each fish, and how these adaptations help the fish survive.

"Trout have been around for thousands of years, but other species, like gar, date back hundreds of millions of years.

"Long before *Tyrannosaurus rex* roamed the earth; fish were swimming around in the ocean."

Vetrano establishes his credentials by describing the inauspicious beginnings of his college career.

"I flunked out," he reported. "I had to stay out for six months. I lost my student deferment and got drafted."

It took three starts before it took, before he found a program, natural resources, that thrilled him.

"I started with a 2.0, and graduated on the dean's list," he said. "I started as a temporary worker for the DNR. After 30 years, I still can't believe they pay me to do this."

The fly rod as a bridge between generations

It's Sunday afternoon and we're gearing up for the first of five evenings of guided fishing. Amazed, I watched as some of the best fly-fishermen in the state started showing up. Several I recognized. Others I knew by reputation. Several are professional guides. A good percentage of them are older. Some are retired.

How was this possible? Some of these guys command fees of several hundred dollars for a guided fishing trip, and yet here they were, unpaid volunteers, reporting, some of them, for a week of duty.

Murray started this journey seven years ago by attending meetings of Trout Unlimited chapters and talking about her idea. She wanted her teens to experience fly-fishing, but she didn't have the necessary skills to teach them. Not much happened at first until John Gribb of Mount Horeb, an officer with the Southern Wisconsin Chapter of Trout Unlimited, picked up the challenge.

"There was a little reluctance in the beginning," Gribb said. "I asked her what I could do. She said, 'Get guides.'"

This was the program's fifth year.



Tina Murray, who developed the Green Teen Program at Shabazz fishes with Jesus Miranda. The students try a lot of outdoor activities, meet enthusiastic people and reflect on their field experiences. "After that, they own it," Murray says.

Skeptics have become believers. Each spring more guides show up. Those who come keep coming back.

"I could tell we were being tested the first two years," Murray said. "We've proven ourselves. We've crossed some invisible barrier."

By Monday night, there was a guide for every student.

"It's good for us," Gribb said. "It's good for the kids. I feel rewarded."

Murray quickly assigns the matches. For the next five evenings, no student will have the same guide twice. There were maybe ten of them this first night, which meant many would end up guiding two students, which is not ideal, especially with excursions limited to 3 1/2 hours.

I was standing by my car, camera ready, watching with amusement as these gnarly, weather-worn outdoorsmen in their beat-up waders, generally a conservative bunch, were paired with rebellious, free-thinking, body-pierced teenagers.

Murray came by, stopped and looked at me. She'd figured out by now that I was a fly-fisherman.

"Did you bring your waders with you?" she asked.

I'd found Jamie Tanaka, 16, standing off by herself while a guide worked with another student. She'd attended two casting clinics, but this was her first time fly-fishing. She was quiet. We fished the West Fork with the others for a while, but then I'd taken her on a hike. I like fishing where there aren't other people around, and this little coulee stream has often been generous.

Now we could see rings on the water. We stayed low and crawled the last 30 feet on hands and knees, watching out for cow patties. Tanaka appeared dubious about this at first, but she didn't say anything. The trout were 25 feet downstream. I tied on a caddis dry fly and showed Jamie how to cast it out and feed line downstream so the fly floats naturally toward the trout and the trout sees the fly before leader and line.

On one of her first casts, a trout rose and took her fly, and in a slow, tentative motion, she lifted the rod. The trout, of course, jumped off the hook. I told Jamie about getting a little mean, setting the hook with purpose. Another cast, another rise and bang, she set the hook. But the trout rushed her, caused the line to go limp, and escaped.

"You're doing great," I said. "I forgot to tell you about stripping in line real quick so you can keep tension on it."

The trout were still rising. Normally spooky, they get like this sometimes, focused on feeding. Tanaka's next cast and drift were perfect. A trout rose to her fly and she set the hook. Keeping the rod tip high, on her feet now, she stripped in line and held tight while the trout tore up the stream and tried power dives, fighting furiously.

I heard a squeal of delight and looked up to see Jamie fully engaged, vibrating with excitement, as if the rod carried an electric charge. We landed the trout, looked admiringly at its bright colors and released it.

Having spoken few words on the way out, we chatted easily all the way back. Jamie had spotted a morel that would be added to others waiting in the kitchen. It was a good catch and she was pleased with herself.

No more than I, master fishing guide.

Flames in the dark

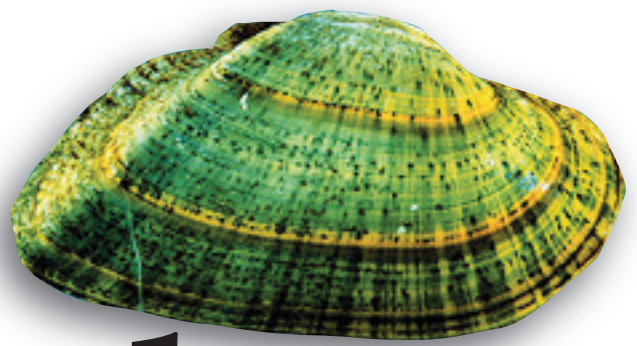
Each night, from 9 to 11, a campfire blazed and the students shared reflections, talking about what they were learning and doing and what it meant in their lives.

Murray said the nightly campfire and shared reflections were a powerful part of the field trip.

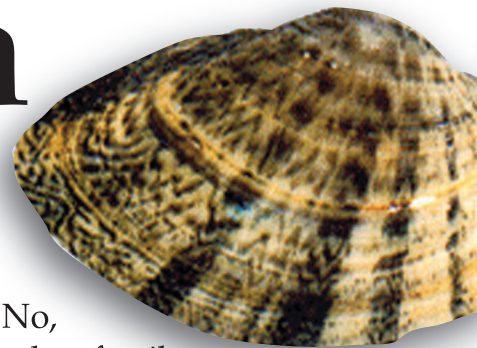
"I think that's the thing that puts it inside the kids," Murray said. "It's in the reflections. After that, they own it." ❧

Ed Culhane is the regional public affairs manager for DNR's West Central Region based in Eau Claire.

Saving native mussels reach by reach



Elktoe mussel



Fawnsfoot mussel

Heather Kaarakka

Deertoe, elktoe, fawnsfoot. No, these terms do not track our deer family friends; they are common names of animals struggling to maintain a toehold in Wisconsin, the freshwater mussels. Exploitation, changing water quality and invasive species all threaten these invertebrates that have fascinating life histories and employ innovative ways to expand their range.

Half of Wisconsin's 51 mussel species are endangered, threatened, or are species of special concern due to overharvesting, stream degradation and displacement by hitchhikers from Europe, the zebra and quagga mussels.

Historically, the most serious threat to mussel populations came from people. In the mid-1800s, a pearl button industry blossomed on the Mississippi River. Mussels were dredged and removed by the ton to be punched into buttons and used in mother-of-pearl inlays. More recently small plugs of mussel shells were used as cores for the overseas cultured pearl industry. All these businesses and damming of waters where mussels traditionally ranged have contributed to their demise.

It's not the pearls or the buttons that make mussels so intriguing; it is the amazing way these animals grow and spread their population. Mussels reproduce like many other water-



MUSCATINE HISTORICAL SOCIETY

dwelling creatures: males release sperm into the water and females filter it out to fertilize their eggs, but the mussels' reproductive cycle only gets more exciting thereafter. Female mussels raise their young on their gills from the time they are eggs until they are im-



Deertoe mussel

WISCONSIN DNR PHOTO



Glochidia on fish gills.

CHRIS BARNHART

Freshwater mussels can spread their young by mimicking small fish and hitching a ride to new territory.

mature mussels called **glochidia**.

From this point in their development, the mussels employ an intricate dance of deception and intrigue. In order for the glochidia to survive, grow and disperse they must attach to the gills of a fish and obtain nutrients from blood serum. The mussels need the host fish to carry the glochidia through the waterways; otherwise the slow-moving mussels would get swept downstream by currents.

Survival is too important to leave to a chance encounter, and the mussel mothers have evolved elaborate ways to entice fish and increase the probability of attaching glochidia to their hosts' gills. Some mussels have developed fleshy appendages that mimic fish prey to such a degree that some even sport "eyes." Depending on their host fish, mussels will tailor their "lures" to look like the tastiest snack the fish can find. The Higgins' eye mussel, for example, has a lure that looks like a delectable



Sacs of glochidia (conglutinates) lure fish, such as this darter, into eating them. The glochidia then form cysts on the fish's gills and drop off into new territory.

CHRIS BARNHART



The snuffbox contains marsupial gills that enclose the immature mussels. When a logperch is lured in, the mussel clamps shut and expels the glochidia that stick to the fish's face and mouth.

CHRIS BARNHART

minnow that its hosts, bass and wall-eye, can hardly resist. It undulates like wriggling baitfish. As the fish comes down to investigate, the mussel releases its glochidia in the fish's face and mouth. The baby mussels are free to attach themselves to gills, eyes and other membranes.

One mussel, the snuffbox, has such a unique way of transferring its glochidia that it has only one species of host fish, the logperch. As the logperch pokes its nose into the mussel looking for the lure, the mussel clamps shut on the fish's head and billows glochidia into the fish's face and mouth. The snuffbox is so strong that it has been known to crush the heads of other fish species investigating the lure. Other mussels have smaller non-predatory hosts and have to attract them by different means. They release sacs of glochidia called **conglutinates**. These little morsels look like perfect snacks to fish, which get a mouth-full of glochidia when they bite the sacs.

After the glochidia take at least a two- to three-week ride on the fish host as a benign parasite, they drop off and land in the bed of a new stretch of a stream, river or lake where they may grow and stay for more than half a century. Mussels are so long-lived in fact, that live mussels can be found in areas that have been dammed off leaving behind populations, which are functionally extinct. When researchers find a mussel whose fish host has been extirpated from the river for 40 years, we know that particular mussel must be at least that old.

Much like a canary in a coal mine, mussels are viewed as important, sensitive indicators of changing environmental conditions. Most species of freshwater mussels prefer clean running water with high oxygen content, and all species are susceptible to pollution including pesticides, heavy metals, ammonia and algal toxins. The presence or absence of a particular mussel species provides information about long-term water health. In general, having healthy diverse populations of mussels means the water quality is good.

Some juvenile forms of mussels are more susceptible to pollution than the



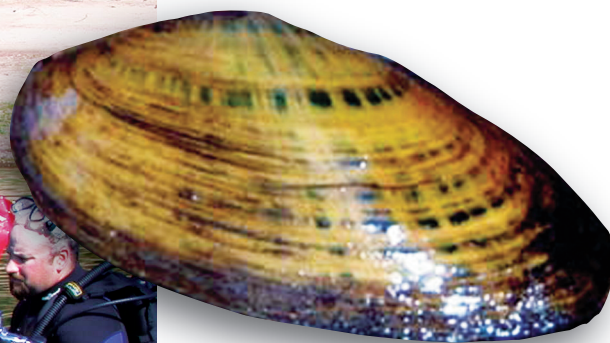
DNR Conservation Biologist John Paul White collects a dead plain pocketbook mussel on the Turtle River in Iron County. The species identification will be checked, the location pinpointed via GPS and the collection site included in the statewide inventory of mussel occurrence and distribution.

HEATHER KAARAKKA



Some larger, deeper mussel beds are periodically inspected and sampled by dive teams.

US FISH & WILDLIFE SERVICE



WISCONSIN DNR PHOTO

Rainbow mussel

banks looking for live and dead mussels. Live mussels are identified and photographed before they are returned to the stream. Empty shells and dead specimens are collected along with information and photos that are sent to the mussel monitoring program at DNR's central office.

Identifying mussels can sometimes be tricky. Basic shape, color, size and beak structure are all used to determine the species. As with most invertebrates, there is some overlap between species description and even sexual dimorphism. It takes a keen eye to distinguish species. To get started on differentiating the species and mussel monitoring, check out the DNR citizen monitoring program online at wiatri.net/inventory/mussels.

Even if you are not ready to participate in mussel surveys, you can help protect them in several ways:

- If you own waterfront property, protect it for mussels by keeping it as natural as possible.
- If you see freshwater clams in the nearshore area where you plan to put in a pier or boat lift, contact the DNR to ask what can be done to reduce impacts on mussels.
- Follow advice to prevent the spread of the invasive zebra mussel.

The future remains uncertain for freshwater mussels, but researchers are learning new aspects of mussel ecology and biology every day. With the help of citizen scientists, mussel ecologists may be able to learn new ways to protect and prevent the loss of these amazing invertebrates.



Heather Kaarakka works on the citizen-based mussel monitoring program for DNR's Bureau of Endangered Resources.



Pimpleback

ENVIRONMENTAL PROTECTION AGENCY

tally the species composition in a given stream at a point in time.

In 1973-1977, Harold A. Mathiak took samples from 251 rivers and streams across Wisconsin. He summarized his findings in *A River Survey of the Unionid Mussels of Wisconsin 1973-1977*, published in 1979. The survey detailed species, listed dates when specimens were collected and pinpointed survey locations. This was the last systematic mussel survey in the state.

DNR's Bureau of Endangered Resources is working with citizen scientists to create a new mussel monitoring program to update the data on mussel distribution statewide. Researchers are enlisting the help of volunteers by contacting schools, nature centers and interested individuals to provide people who enjoy being outside with the training to conduct stream surveys. Volunteers wade the water and walk stream

Pink papershell mussel



ILLINOIS NATURAL HISTORY SURVEY

adult forms, so finding juveniles with few adults nearby may indicate a newly colonized area. Since mussels are long-lived, they can be used to document changes in water quality over long periods of time. Growth rings on mussel shells determine their age. During a time of rest, the shell accumulates a defined line indicating a period of no growth. These lines can be used to glean information about historical water quality and disturbance. Mussel shells also accumulate metals from both water and sediment. Testing heavy metal concentrations in shells can tell researchers when water in a given area was first contaminated.

Currently, it is illegal to harvest any live mussels in Wisconsin, but mussel shells can be collected statewide unless they are endangered or were found on the St. Croix or Namekagon rivers. Examining these shells provides mussel researchers with an excellent tool to

Bluebirds on the rebound

Continuing commitment by a growing number of volunteers helps bluebird populations recover in Wisconsin.

Kent D. Hall

What's not to like about bluebirds? They are a symbol of happiness, optimism and are celebrated in song as the *Bluebird of Happiness*, the *Zip-a-dee-doo-dah* bird on your shoulder and even flying *Somewhere Over the Rainbow*. Moreover, eastern bluebird populations are on the rise in Wisconsin, but that wasn't always the case.

In the late 70s and 80s bluebirds plunged to alarmingly low numbers. Ice storms on their wintering grounds, a loss of nesting habitat and poor nesting success up north contributed to a 90 percent reduction in bluebirds here in less than 50 years.

JOHN & FILOMENA LARSON

Alarmed about this situation, Wisconsin DNR's Bureau of Endangered Resources approached citizen groups around the state back in the winter of 1986 to stimulate interest in starting an artificial nest box program to bring back this imperiled species. As a result of that meeting, the Bluebird Restoration Association of WI (BRAW) formed in March 1986 to build some help for bluebirds.

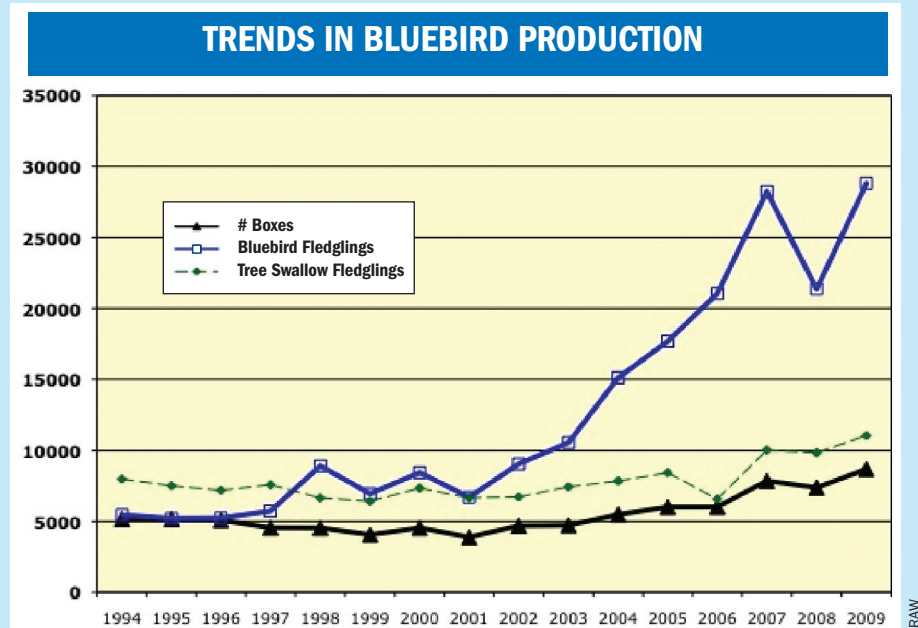
There was natural support. Bluebirds are brilliant and beautiful, especially the males. They are early spring migrants and seeing them in March helps us break the psychological grip of winter. Also, they are easy to see and recognize. Many species are secretive and flit around in the bushes, but bluebirds are open area birds that "perch hunt" for food. They are amazingly tolerant of humans while they are nesting. They invite us into their lives and make it easy to seal a friendship.

In the 23 years since BRAW was formed, the blue-

Bluebirds are sight feeders that like to sit on a high perch and survey an area looking for food. They will eat crickets, grasshoppers, insect larvae and berries.



STEPHEN J. LANG



The number of bluebird nest boxes placed and monitored continues to increase. By learning more about effective box designs, box placement and predator controls, the number of bluebirds counted in Wisconsin in the last nine years has increased dramatically.

bird population has made an astounding recovery and is now at a 45-year high. This recovery is due, in part, to a cadre of concerned citizens putting up and monitoring nest boxes and represents the greatest recovery of a songbird population in Wisconsin conservation history, largely because people cared about this beautiful bird.

The population recovery parallels reports we get from BRAW members who monitor and track bluebird production from the nest boxes they build

and place. In fact, Wisconsin leads the nation in rebuilding the bluebird population from artificial nest boxes. It's not because we have naturally higher populations than other areas of the country, but we do a lot of research and share what's working with those who want to bring bluebirds back. We learned that bluebirds are territorial and need at least one to three acres and up to 20 acres of land to collect food. Other cavity nesters like tree swallows protect only the nest box area and can forage up to four miles in all directions for food. Nest boxes placed closer together than 100 yards favor the colonial nature of tree swallows and limit occupancy by bluebirds.

In our first 20 years of collecting data BRAW has determined which factors are most important for increasing bluebird production: 1. nest box location, 2. spacing between boxes, 3. relocation if the birds don't produce young, 4. the direction the nest box opening faces, 5. nest box design, and 6. predator guards.

Visit our website, www.braw.org and click on the first item under "Starting a Trail." The gist of our recommendations are summarized in Table 4 on the site.

In the fall of 2006, BRAW started "Operation: Top State" (OTS), a program to apply the research techniques we discovered in our first 19 years to increase bluebird production. The program has been a huge success by increasing the number of nest boxes statewide, encouraging better management of those artificial nest boxes, and more diligently monitoring nesting success. The number of nest boxes monitored has increased by 2,678 (44%) and bluebird production has increased 37% by 7,767 birds. Many more people are monitoring nest boxes than ever be-



Jenny Wenzel and Helen Pugh (left to right) of the Hoy Audubon Society put up a bluebird nest box along Maplecrest Country Club in Kenosha County. More than 750 people statewide monitor about 10,000 bluebird nest boxes each year, according to the Bluebird Restoration Association of Wisconsin.



The author and students from the Fox River Academy in Appleton installed 30 nest boxes along a bluebird trail in Pierce Park next to the environmental charter school. Students monitor fledging rates as part of their studies.

fore. We've increased that number 245% adding another 355 people to our monitoring network.

You might think that we could rest on our laurels, take down our nest boxes and move on to other matters, but that is not the case. Populations of



Maureen and Zach Brocken construct nest boxes for the Audubon Bird Trail in central Wisconsin. More than 1,300 boxes have been erected in the central part of the state.

bluebirds are still low compared to other common cavity nesters. There are two-and-a-half times as many chickadees, three-and-a-half times as many tree swallows and four times as many wrens as bluebirds. Moreover, of the three species, the bluebird is highly vulnerable to mortality in its overwintering habitat. Ice storms in the southern United States, where bluebirds overwinter, will continue to decimate these birds, so conservation measures will continue to be necessary.

Another initiative is equally important to BRAW: conservation education for youth. Over the past two years, BRAW members have worked to establish nest box trails and bird monitoring programs for elementary, middle school and high school students, 4-H clubs and nature centers.

In school and nature center settings, we know that some of the nest boxes will be placed in habitat that is also appealing to tree swallows, chickadees and wrens as well as to bluebirds. The educational value of helping build nest boxes, installing boxes and especially collecting data as birds complete their nesting cycles is exceptional. A bigger challenge for school groups may be that the natural growth cycles for swallows and wrens are not completed by the time school gets out. Summer school groups sometimes continue the monitoring, however.

Along the way, school groups monitoring these boxes learn how one misconception about bluebirds is a myth.

The notion that opening nest boxes once per week to count baby birds and eggs will automatically cause the parents to abandon the nest is simply not true. In fact, eggs and chicks can be viewed without causing rejection by the parents. That's just one of the lessons I learned myself. Despite three college degrees, I'd have to say that when I started monitoring nest boxes eight years ago, my bluebird education was at the elementary school level. Although my knowledge has increased exponentially since then, I am still learning to think like a bluebird.

I invite others interested in becoming a bluebird monitor or learning more about bluebirds to join us at the Bluebird Restoration Association of Wisconsin. Check out our website at www.braw.org. You'll find plenty of contacts for more information by clicking on the contacts list in the navigation listing on the left side of the site. Spend a few minutes poking around and you will also find information on how to start a bluebird trail program, directions for building and siting nest boxes and details about bird life cycles. Find monitoring forms for reporting your sightings, see bluebird merchandise and discover links to outstanding bluebird photos. Please share the happiness we've found in watching and encouraging more bluebirds.

Kent D. Hall coordinates data collection and analysis for the Bluebird Restoration Association of Wisconsin.



A. big vision

for a broad landscape

An expansive 15,000 acres of grasslands, wetlands, river bottoms and forest between Wisconsin Dells and Portage are managed to maintain the natural riches of birds, wildlife and people who live there.

Steve Swenson, Yoyi Steele and Michael Mossman



The view east and south along the Leopold-Pine Island Important Bird Area shows the meandering Wisconsin River, sandbars, lowland forests, grasslands, savannas, marshes and uplands that provide a rich mix of habitats for birds, mammals, insects, fish and people!

COURTESY OF MICHAEL MOSSMAN

Abundant wildlife has always been part of Wisconsin's identity. From the earliest accounts to present times, we know that wildlife can thrive here. However, the face of wildlife has changed over time. For instance, if asked today to pick an animal that represents the pride of Wisconsin wildlife, you might choose white-tailed deer. Some 250 years ago, it might have been elk.

It's similar with birds. Previous generations of Wisconsinites identified with huge flocks of passenger pigeons, prairie chickens and sharp-tailed grouse. Today we might think of sandhill cranes, wild turkeys, eastern bluebirds or bald eagles. These differences come about from changing land uses, hunting practices, chemical usage and specific efforts to conserve wildlife. They reflect changes in our relationships to wild things.

Conservationist Aldo Leopold, author of the celebrated *A Sand County Almanac*, said, “There are two things that interest me: people’s relationship to land and people’s relationship to each other.” He understood the importance of these relationships and their profound effect on wildlife. For example, in Wisconsin our grassland birds first depended on native prairies. With the coming of widespread agriculture,



KEVIN BOLTON

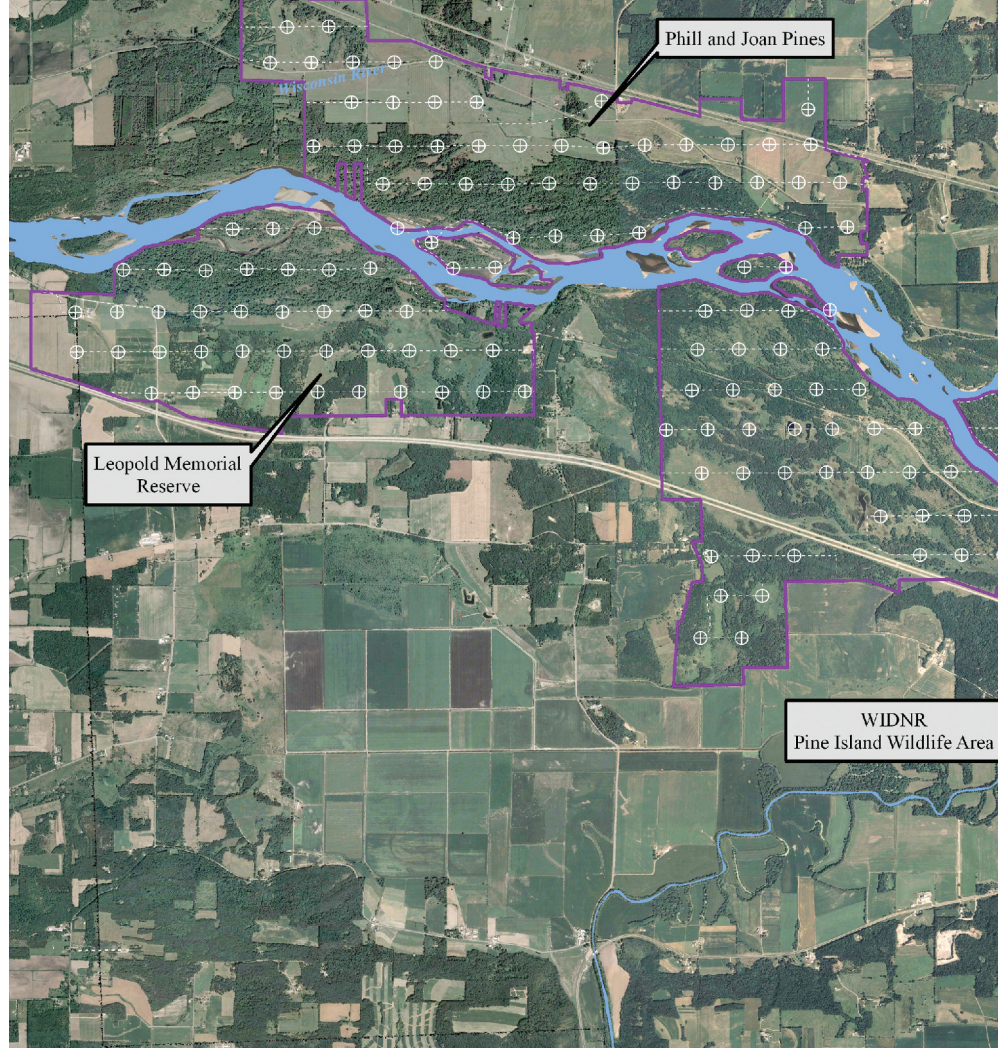
The indigo bunting, which inhabits open fields and woodlands, is one of the common species that also benefits from this broad landscape management plan.

these birds survived in grassy hayfields and pastures. But, with more recent trends toward row crops and succession of many fields to woods, grassland bird populations have plummeted. They depend more and more on fewer acres of prairie restorations and “idle” or specially managed grasslands such as those enrolled in the Conservation Reserve Program.

Leopold advocated for a “land ethic,” a set of values that would unite people in a common bond with public and private lands. He practiced this ethic on his own property along the Wisconsin River north of Baraboo, site of the now-famous “shack,” which he purchased in 1935. The Leopold family enjoyed the property for its modest beauty and peace and quiet, but mostly because it connected them to the land. They spent 13 years transforming it (and themselves) by planting thousands of pines, hardwoods, shrubs and wildflowers until Leopold’s death in 1948. Today, that “worn-out farm” has yielded several timber harvests and hosts spectacular prairies and abundant wildlife; it’s the heart of the 1,700-acre Leopold Memorial Reserve.

Some 60 years after the publication of the *Almanac*, it is perhaps fitting that

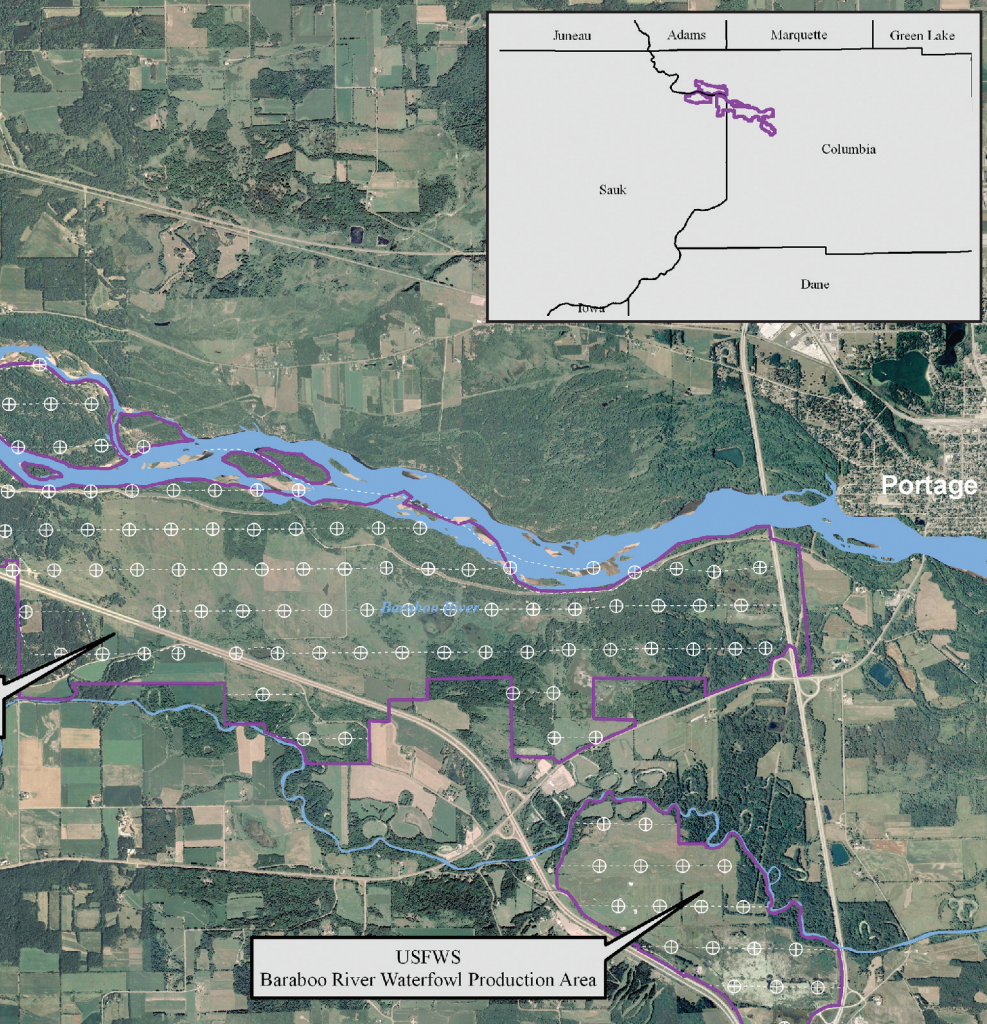
STEVE SWENSON



A closer look shows a patchwork of public and private landownership in the project area as well as the transects where data on bird use were gathered. Several area projects have restored smaller parcels of wildlife habitat, but this ambitious plan aims to restore conditions for species that use larger tracts of adjoining land to meet their habitat needs.



(left to right) Yoyl Steele and Mike Mossman discuss grassland habitat restoration with landowner Phill Pines on his property.



STEVE SWENSON

we — a land manager, a researcher and a planner — would find ourselves on Leopold's home ground, working to apply that land ethic to a new opportunity and to a wealth of scientific knowledge that have developed since his time. Our goal: to bring together a team of landowners, managers and volunteers to create a conservation future for even larger landscapes of public and private properties. Our work demonstrates a way to help citizens and professionals collectively manage landscapes in a mosaic of ownership.

The Leopold-Pine Island IBA

Our project began five years ago as part of Wisconsin's new Important Bird Areas (IBA) Program, an effort to gather the expertise of ecologists, land managers and birders to take stock of Wisconsin's rich bird life and identify the places most critical to sustaining those birds. Of the 88 sites identified, many were already set aside as federal or state properties such as Horicon Marsh and the Chequamegon-Nicolet National Forest. Others included regions composed of both public and private lands such as the Baraboo Hills and Lower Chippewa River. After all, private

landowners own roughly 85 percent of Wisconsin, and those lands harbor the majority of Wisconsin's wildlife.

Among these valued properties was the 15,000-acre Leopold-Pine Island Important Bird Area (LPI IBA) situated along the Wisconsin River between Wisconsin Dells and Portage. Land ownership in the project area is diverse, including DNR's Pine Island Wildlife Area, the federally-owned Lower Baraboo River Waterfowl Production Area, the Leopold Memorial Reserve (owned by the Aldo Leopold Foundation, the Sand County Foundation, and other landowners including Frank and Colleen Terbilcox), and many private properties, the largest being a 2,100-acre farm owned by Phill and Joan Pines.

The landscape here is as diverse as the ownership. It's located at the juncture of three ecological regions: the ancient, sandy bed of Glacial Lake Wisconsin to the north; the marshy, lightly rolling glaciated territory to the east; and the older hills of the Driftless Area to the south and west. It is a landscape shaped by ice and water. Thousands of years ago, glaciers smoothed the land and then melted away, leaving

hills of sand and gravel. The Wisconsin River developed, draining the glacial lake and depositing thick beds of sand. These dramatic forces, along with the influence of fire over the landscape, gave rise to many different plant communities including upland and lowland forests, marshes, savannas and grasslands. More recently, the land has been shaped by cultivation, grazing, timber harvesting, changes in surface and groundwater flow, reduced flooding, development and fire control. Several projects in the area have restored smaller parcels of native and non-native wildlife habitats. For example, a patchwork of projects has filled old ditches, planted fields to prairie and other grasses, and restored former savannas through prescribed fire and cutting.

This mix of landscapes and activities has provided for fantastic birdlife by enhancing areas that breeding birds use. Owners are managing floodplain forests for red-shouldered hawks and yellow-billed cuckoos; restoring shrub and savanna used by willow flycatchers and red-headed woodpeckers; maintaining the grasslands that are home to Henslow's sparrows, bobolinks and eastern meadowlarks; and improving marshes that hold swamp sparrows, rails and blue-winged teal. On the Pines property, 10-15 percent of Wisconsin's sandhill crane population gathers on the river sandbars each fall forming migration flocks, with a few whooping cranes now among them.

The mix of habitats and birds challenges conservation planning. It's not just a matter of "managing habitat." Strategy is important. What's good for one species is not always good for another. Some wildlife species are in greater need of help than others. Many need large tracts of habitat because they have large territories or do not breed successfully near habitat boundaries, while others thrive at these edges. Some live in ephemeral habitats such as young forest, or marshes invaded by a few shrubs. So connecting habitats across different ownerships, and ensuring that all important habitats are present in sufficient abundance takes some planning and cooperation among nearby landowners, all of whom have their own property goals to meet as well. Developing practical approaches that can benefit wildlife, land and landowners is a balancing act.

Yet, increasingly, this sort of challenge represents the future of wildlife conservation.

In this regard, birds can be an “ace in the hole” for managers. Since they move freely across the landscape and use habitat without regard to ownership, they unify properties. People readily understand that birds have well-defined habitat requirements, and their presence indicates quality breeding sites. Birds are also easier to collect information on than most other animals because their unique songs and colors make them easy to identify quickly, so bird surveyors can cover a large area in a short amount of time. Beyond that, a diversity of birds usually goes hand-in-hand with an overall richness of wildlife. Like any good indicator, understanding the bird community allows us to understand so much more.

We began by conducting a basic inventory — a systematic breeding-bird survey where we set up 234 count-stations along 67 miles of transects across the area. We recorded all the stations with a GPS unit so we could map bird locations and repeat the survey in the future. We also recorded bird habitats so we could link bird species with specific habitat features across each property. Volunteers collected additional information on both breeding and migrant birds. This resulted in a list of 117 breeding species and at least 40 migrant species.

However, planning land management for 117 breeding bird species would send even a bird expert’s head spinning. We wanted to focus on those that really need the help and for which this IBA can make a difference. In other words, we wanted to “think globally, act locally.” Using the survey’s



STEVE SWENSON

The team met with each landowner to discuss field results, set plans for the land and explain what will happen over time on adjoining parcels beyond their property borders.

bird habitat data, and national and regional conservation plans such as Partners in Flight and DNR’s Wildlife Action Plan, we narrowed the list to 24 priority species that would help guide management on the IBA. These priority birds serve as “ambassadors” for hundreds of other common birds, and for other animals and plants that depend on these same habitats. We also built in the goals of local landowners for their property so we could develop a plan that was mutually beneficial for people, wildlife and the land.

With those draft ideas in hand, we met with individual partners and

groups to form plans for each landowner. For example, we agreed on pasture, hay and retired grassland on the Pines’ farm, while proposing a natural mix of marsh, prairie and savanna on the Leopold Memorial Reserve. We consolidated similar habitats wherever possible for ease of management and because many priority bird species need large tracts of habitat for successful breeding. The resulting report set a common vision for the whole Important Bird Area.

The report identified the IBA as an important landscape for birds of open and semi-open habitats like prairies, marshes, shrublands, savannas, and working agricultural lands such as hayfields and pastures. To maintain their openness, these habitats need regular disturbance such as prescribed burning, mowing and cutting of trees and shrubs.

The extensive floodplain forest of the Lower Baraboo River is the IBA’s significant opportunity for forest-loving birds. The plan encourages sustainable forestry practices, some no-cut areas and some reforestation to benefit birds that thrive in floodplain forest. Many small tracts that serve as transitions between larger areas of open and

PRIORITY SPECIES FOR MANAGEMENT ON THE LEOPOLD-PINE ISLAND IMPORTANT BIRD AREA			
Grassland	Marsh	Shrub/Savanna	Forest
sedge wren	sandhill crane	willow flycatcher	yellow-billed cuckoo
field sparrow	marsh wren	black-billed cuckoo	red-shouldered hawk
grasshopper sparrow	swamp sparrow	red-headed woodpecker	veery
Henslow’s sparrow	blue-winged teal	blue-winged warbler	wood thrush
bobolink	black tern		cerulean warbler
northern bobwhite			
vesper sparrow			
savannah sparrow			
dickcissel			
eastern meadowlark			



Where the lower Baraboo and Wisconsin rivers meet, a plan for the floodplain forest will include some sustainable harvests, some reforestation and some no-cut areas that are good for the woods and good for birds that thrive in forestlands.

MIKE MOSSMAN



A part of the Pines' property was burned in spring 2009 to stimulate growth of young prairie plants and provide food and cover for birds of the open fields.

ALANNA KOSHOLLEK, ALDO LEOPOLD FOUNDATION

forested parcels can be managed for young hardwood forest and shrubs to benefit birds like American woodcock and blue-winged warblers. In a few areas, simple protection from disturbance is all that is called for, notably the Wisconsin River sandbars where 3,000-5,000 sandhill cranes stage annually for migration.

Actions that support the whole

The management activities proposed in the plan include timber harvests, prescribed burning, prairie plantings, mowing, invasive species control, and wetland and stream restorations. Although these practices have been used in the past, our collective planning revealed new ways to modify where, when and how these techniques are applied on all the properties in order to further our common vision.

For example, several prairie restorations on the Leopold Memorial Reserve, while successful for plants, turned out to have little value for grassland birds because they are isolated and surrounded by woodland. Connecting them by removing or thinning the intervening woods and shrubs will make them much more valuable to birds and wildlife.



STEVE SWENSON

Thinning timber on part of the Leopold Memorial Reserve will help restore open savanna lands and provide a home for species that use these scattered corpses of trees on a more open landscape.

"Seeing landscape design through the eyes of birds has helped us think more strategically about our management and our contribution to wildlife conservation," says Kevin McAleese, Programs Director for the Sand County Foundation. "Our upcoming wetland restoration will benefit greatly as we consider its connection to surrounding habitats."

The wetland restoration would be of little value unless some of the surrounding ag land was restored to grassland as well, Mossman added.

Birds and the bird community will benefit greatly if the restored plant community is viewed within and connected to the surrounding lands to create a land system rather than a small, isolated patch of habitat, Swenson added.

Likewise, for a property as large as




DENNIS MALUEG

The once-common and widespread field sparrow uses grassy areas with scattered tall shrubs and trees. Restoration work will open up the land for this species and similar birds like the brown thrasher, eastern towhee and orchard oriole that use the same habitat.

the DNR's Pine Island Wildlife Area, decisions need to be prioritized. "We have a lot of different user groups and a lot of property to manage," says DNR Wildlife Biologist Sara Kehrl. "Knowing which parts of our property contribute the most to both wildlife conservation and the needs of our users helps us be most effective with time and money."

For other partners, unexpected opportunities came to light. For example, the U.S. Fish & Wildlife Service (USFWS) typically promotes grasslands and marshes on its Waterfowl Production Areas (WPAs). However, the plan recognized an opportunity to expand the forested corridor along the Baraboo River on the Lower Baraboo River WPA. "Seeing management options on our property in the context of the entire partnership gave us new insight," says USFWS Biologist Jim Lutes. "Areas that I typically don't concentrate on suddenly have value because they support similar habitat on partnering lands."

Not surprisingly, as trust and respect grew among the partnership, simple conversations created other opportunities. "Communication with the partners helped me see ways to be more active in my approach to management," says Phill Pines. "I removed the scattered trees in my grasslands, providing an immediate and significant benefit to our priority grassland birds."

Clearly, the IBA partnership has value: communication, data collection, recognition, purposeful action, trust and respect. Not only are these the hallmarks of excellent conservation, but of lasting relationships between people and land. "As neighbors, we always knew we were in this together, but this effort has made it more tangible," says Lutes. "It's like putting together a puzzle, challenging and revealing all at the same time." So, too, are relationships. In our increasingly complex landscape, understanding our relationship with the land and with one another is our best chance to create a whole that is greater than the sum of its parts. 

Steve Swenson is an ecologist with the Aldo Leopold Foundation in Baraboo. Yoyi Steele works on bird conservation planning for the Wisconsin Bird Conservation Initiative in DNR's Bureau of Wildlife Management. Michael Mossman is a forest community ecologist for DNR's Bureau of Integrated Science Services.

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@wisconsin.gov

HUNTERS: ADAPT TO CHANGING DEER NUMBERS

The amount of press the squeaky wheel is getting talking about our deer population is unbelievable. Throughout the 1990s and into the early 2000s, we had the best deer hunting and viewing ever! It was great if you liked to hunt and see deer like I do. For years we were told by the DNR there were too many deer, and they were right. We lost some valuable undergrowth and other plant species we may never get back, nor do we know what impact this large herd can have on the environment. For years we all knew the deer population needed to be reduced. Now, so many who forgot all this so quickly are ready to crucify the DNR. For those who don't like smaller herds, get off your bait piles and those permanent small houses you call "deer stands" and learn to hunt. Deer numbers are low, I agree. We have come off the third and fourth worst winters on record, the highest coyote and wolf populations on record and the DNR herd reduction program is finally making an impact. Populations will fluctuate — get used to it or quit hunting.

Chris Martin
Readfield

BAN BAITING STATEWIDE

I cannot agree more with the letter in the February Readers Write section. Baiting must be banned statewide. There is absolutely no natural deer movement any more. People have become baiters instead of hunters. Case in point: we hunt Lincoln and Price counties and walk through woods during deer season. Tracks are very hard to find until you find a bait pile, which is becoming quite often. Everyone up here baits, whether it's on private or public land. I have been deer hunting

for over 40 years and in the early 2000s started to see fewer and fewer deer but more and more baiting each year. I'm not sure why people think baiting is the answer unless people are just getting lazier.

My group talked to the wardens in Tomahawk who explained what happens with baiting. The first deer into a bait pile: a nubbin buck. Next is the yearling doe, adult doe and then the mature buck, usually at night. People shoot the first deer they see come in, the yearling buck. That's the reason they told us buck sightings are decreasing all around the state, coupled with the T-zone hunt. Baiting has become the number one ticketed offense during hunting season. And that's just the ones they catch! When you ask a person why they bait they say that's the only way to get a deer. This has become an epidemic. You don't see hunters walking in the woods any more, just sitting in a tree stand near a pile of corn, pumpkins and cabbage. This has become a sorry state. I will personally never stop hunting, but my expectations for deer hunting in Wisconsin have never been lower. Not even the 1960s were this disappointing.

Tom Balestrieri
Sussex

BAITING ISN'T PROBLEM — GET DEER MOVING

I've hunted deer for 70 years in Wisconsin and other states and countries. I have never experienced a season as poor as this last one. In reading your magazine, I see a lot of people against baiting. Baiting is one of the safest hunting practices. Nobody has ever been shot over a bait set. However, when I first started hunting, we did not bait. At that time we made drives. The first day you could find deer almost anywhere. After that, you had to drive the thickets and swamps to get the deer moving. I think this idea of deer becoming nocturnal because of baiting is all wet. In recent years I sat over bait stands from 10 a.m. to 2 p.m. I got a lot of nice bucks.

My experience is the deer become very cautious. Once you start shooting, the deer head for cover. Now most of my hunting is done on public land, either federal or county forest. These hunters claiming deer become nocturnal should get off their stands and start making drives to get deer moving. They have a lot to learn about deer habits.

Laddie W. Holoubek
Phillips

SKEPTICAL ABOUT CLIMATE CHANGE

Just a few thoughts on "Preparing to adapt," your climate change piece in February. The Lake Mendota ice study is hardly representative of lakes in Wisconsin. Lake Mendota is surrounded by streets and receives more salt, less ice plus whatever 150 years of other water pollution has caused. It is also interesting that the WICCI has distanced itself from the Governor's Task Force on Global Warming. How will the ballooning need for wind generators affect the tourist industry across our beautiful state?

Several other more immediate issues need to be addressed first. Precipitation and runoff problems need to be addressed by communities. Until Milwaukee stops discharging untreated sewage with rain runoff into Lake Michigan, Wisconsin won't have much of a say when getting together with other states and Canada. Likewise, our state has been very slow to act on invasive species caused by Great Lakes shipping and the Asian carp invasion.

Bill Klaetsch
Elkhart Lake

Limnologist and Lake Mendota expert Professor John Magnuson responds: *Lake Mendota is in no way unique in its decreasing ice cover. This feature is shared with other lakes in Wisconsin, across the Great Lakes Region, and around the Northern Hemisphere. Many of these lakes are in areas where road salt is not applied and the salinity of the lake is not changing. While the increasing salt content of the*

Lake Mendota water is not a welcome trend for the quality of our waters, the salt levels are insufficient to change the freezing point depression of water significantly. The trends in lake ice cover on Lake Mendota is not explained by local causes but rather is a response to more global forces.

Regarding why the WICCI research is separate from the Global Task Force recommendations, the article authors respond: *The Wisconsin Initiative on Climate Change Impacts (WICCI) is and has always been independent from the Governor's Global Warming Task Force, which examined sources of greenhouse gas emissions that cause climate change. WICCI concerns itself with the impacts of changes in our climate, which have been recorded in the historical record, and which appear to be accelerating. Wisconsin's climate is changing and WICCI was established to analyze and respond to these changes.*

I flatly disagree with statements that spring arrivals of some migrating birds have changed due to climate change. When I was six, I was already observing birds on my grandfather's farm. Now I am 66 and have identified over 200 species in Sheboygan County. I see absolutely no major changes whatsoever in the approximate arrival dates of birds in this county in the past half century due to climate change. Yes, there is some year-to-year fluctuation due to exceptionally cold or warm springs. This is more true of birds wintering just south of Wisconsin like red-winged blackbirds, robins and song sparrows.

For me, the harbingers of spring are the red-winged blackbirds because they arrive in large numbers, sometimes in late February, last year on March 14.

Most warblers arrive often in waves starting in May. Books such as Samuel D. Robbins' *Wisconsin Birdlife Past and Present* and the *Golden Guide to Birds of North America* show the approximate arrival dates are



essentially consistent with my observations in the last half century.

Phillip Wynveen
Sheboygan

Ornithologist Stanley Temple at the Aldo Leopold Foundation provided this:

There are two types of migrants in Wisconsin: (1) short-distance migrants that breed here and spend the winter somewhere in North America, often just a few hundred miles south of us (examples are American robins, red-winged blackbirds, eastern phoebes and most grassland birds). The timing of their return to the breeding range is strongly influenced by seasonal changes in temperature and can vary quite a bit from year to year with weather. (2) long-distance migrants that breed here but spend the winter far to the south in Central America, the Caribbean and South America (examples are wood thrushes, scarlet tanagers, Baltimore orioles and most warblers). The timing of their migration movements is influenced primarily by photoperiod (changes in daylength) which does not vary over time.

Several long-term studies in Wisconsin (my own using data from the Wisconsin Checklist Project and the Leopold family's phenological data) show a clear distinction between these two groups. Short-distance migrants (e.g., American robins) have been arriving back in Wisconsin about a day or so earlier each decade since the 1930s, whereas long-distance migrants (e.g., wood thrushes) have not changed their schedule. The earlier arrivals of short-distance migrants are correlated with observed climate change. I suspect the writer may have been reflecting primarily on the May arrival of the long-distance migrants, and he's correct in his observations.

RECYCLING POSTER WELL RECEIVED

[Editor's note: A story and poster celebrating 20 years of recycling in Wisconsin ("Recycling roundtable," February 2010) received kudos from recycling specialists and others around the state. DNR's Recycling Outreach Coordinator Elisabeth Olson

shared several with magazine readers.]

I saw your piece on recycling in *Wisconsin Natural Resources*. It was really interesting and informative. Please extend my appreciation to all involved. The presentation was excellent.

Jeff Margenau
Madison

Your new postings and updates are really fantastic! I thought the roundtable session was so well done with a dynamic group. Excellent! Please let your colleagues know that they are doing a great job.

Meribeth Sullivan
Waukesha County Recycling Specialist

Thanks again! This poster is so well done and addresses so many of the most frequently asked questions that we receive all the time. And the information is all presented in such a way that it truly can be used anywhere in the state regardless of minor program differences! Love it!

Rick Meyers
City of Milwaukee Recycling Specialist

Love the poster! I would like a few, especially for the schools I hope to get into the Green School Program this year.

Debbie Krogwold
Waupaca County Recycling Coordinator

A SNAKE'S PERSPECTIVE

When I saw the letter in the February Readers Write column that asks about a story told from the snake's perspective, I thought of *A Snake in the House* by Faith McNulty. This children's book, beautifully illustrated by Ted Rand, is probably not what the letter writer had in mind, but I find it charming.

Johanna Fabke
McFarland

EXPAND PROTECTION OF TOMAHAWK RIVER

In your February issue, on the back cover, you show the lower Tomahawk River Pines State Natural Area. This is a beautiful area

and I wish in future planning that it be enlarged to protect the Tomahawk River. I have made many canoe trips on the Tomahawk River and hope more of the adjacent areas could be secured with public bonds to preserve the river's natural setting.

Michael L. Igoe
Chicago, Ill.

REACTIONS TO CLIMATE CHANGE PIECE

It is our observation that because of a cool summer 2009 and later blooming native host and nectar sources for pollinators, we are already witnessing a decline in monarch butterflies (life cycle) at two monarch butterfly habitat areas we maintain in Shell Lake.

We plan to work with Native American Butterfly Association on the National July 4 Butterfly Counts, Monarch Larva Monitoring Project, Univ. of Minn. and Xeriscape Foundation to monitor butterfly species this summer.

Mary Ellen Ryall
Executive Director
Happy Tonics, Inc.
Shell Lake

SURPRISE SPRING TREAT



I have enjoyed hunting and eating morel mushrooms for many years. We all know that dead elms are places to start looking for mushrooms, but they can be found in other unusual, surprising places. Heart surgery curtailed my spring hunt last year and I am convinced this mushroom came to me. We found this 5 1/2-inch beauty growing out of the concrete between our garage and an attached extension. It grew out of the corner where the sidewalk attaches to the buildings in the southeast corner. Have you heard of a stranger place? It didn't make a big meal but it reminded us what a treat it is to enjoy this springtime treasure.

Bob Wells
Wisconsin Rapids

SHALLOW TAPS SAVE TREES

I work at Wehr Nature Center near Milwaukee where we do a maple sugaring program and produce a few gallons of syrup each year. Your article about maple sugaring at the MacKenzie Environmental Education Center ("A sweet treat in the season of melting snow," February 2010) was excellent with the exception of the advice on drilling depth for spiles. You said tapped holes should be three to four inches deep. If you take a look at cross-sections of trees eligible for tapping, you'll quickly see a three- to four-inch-deep hole will often penetrate the heartwood. That will shorten the life of trees significantly. It would be tragic if people were to tap a 100-year-old sugar maple tree at three to four inches deep, even though there is a chance the heartwood wouldn't be penetrated. We tell people a two-inch deep hole is the maximum depth to drill for any tree.

Once the line is crossed beyond the sapwood into the heartwood there is no going back, so taking chances with a three- to four-inch deep hole is like loving trees to death. Don't unknowingly cause the early death of an old tree just to get a little sugar out of it.

Mark Verhagen
Natural Areas Management Specialist
Wehr Nature Center/UW – Extension
Franklin

Good advice. Since the spile is only about four inches long and part of it needs to protrude to hang a pail or attach a drip tube, only drill a tap hole about two inches deep and don't tap trees that are less than 10 inches in diameter (about 40 years old) so you will only penetrate the sapwood, which can heal.

TIGER MUSKY NO LONGER PRODUCED

I was rereading some old DNR magazine articles and have a question about hybrid (tiger) muskies. I understand how hybrid muskies occur naturally. The northern pike and musky both spawn in the same areas, with the northern pike spawning first. Some of the smaller

male pike hang around looking for late-spawning females and sometimes cross breed with the early arriving female muskies. I assume that hatchery hybrids are made the same way (female musky, male northern pike). Is there a hybrid made by crossing female northern pike with male musky? I can see how it would be unlikely to happen in nature, but has this ever been tried in a hatchery? I don't think it would be a useful hybrid, with the fish probably retaining the smaller size of the northern pike, but I was just wondering if it has ever been tried and what the fish looked like.

Karl Achterberg
Gordon

Al Kaas, DNR's Statewide Fish Propagation Coordinator replies: *The reciprocal cross (male muskellunge x female northern pike) is possible to make in the hatchery, but Wisconsin has not done this. I understand that the egg survival is very low and that survivors do not grow nearly as well. Incidentally, the Wisconsin DNR no longer rears the hybrid (tiger) muskellunge (female muskellunge x male northern pike) in its hatcheries.*

REINFORCE WIRE HANGERS FOR HUNTING CLOTHES



With the advent of hunting clothes, the fact that they are usually heavy and wet at the end of the day, and the fact that most are sold on plastic hangers which break in cold weather, I tried a different method. Recently, when clearing out closets from an estate, I had an excess of wire hangers — as do most thrift shops. I used Havahart™ rabbit trap clips shown — which I had used for making tree protectors from plastic chicken wire for tree plantings — and clipped three old metal hangers together as shown. They can handle the weight of wet clothes, are very strong and are a much better use than recycling the old hangers. If you wish, you can wrap them with gimp, or dip them to prevent rust. Make sure you place the clips where no cloth will contact them.

Bruce Solberg
Green Bay

A tiny terror in a sandy pit

I see such an ant tracing a return path across the sand weaving over and around obstacles and dangers. Small two-inch depressions pock the surface. These minor divots, little dips in the sand, soon present a surfside drama for survival. They are traps that are about to spring.



A telltale pit where an antlion lies in wait. Watch out ants!

ELWIN TRUMP

Leaning over the side of a precisely dug pit, the ant peers down, unaware. It continues into the conical depression. Steep, slippery sides are ready to avalanche sending loose sand grains tumbling with the slightest motion. Once inside there is almost no hope of escape. The ant scrambles to hold its position and slides toward the center of the cone. Suddenly a camouflaged predator springs into action from just underneath the sand. It kicks up and sprays sand, pelting the ant and mercilessly knocking it down the slope towards its waiting crushing jaws. The half-inch insect chomps onto the ant with massive pincer jaws and injects an immobilizing poison. Soon the ant's innards are liquefied and sucked out by this efficient, fierce killer that tosses the ant's spent exoskeleton out of the pit and repairs the scene for the next victim.

Be grateful these creatures are only the length of our fingernail. Antlions earn their name from their lion-like, ferocious attack and voracious appetite for ants. The predatory larva keeps this form for two years or more then develops into a four-winged insect like a damselfly or lacewing. In the Americas, another common name "doodlebug" refers to the larva's spiraling dance in the sand before it starts tracing concentric circles to mark the pit it will excavate.

Antlions reside in dry sandy areas near leaves, decaying wood particles or small rocks at the base of a tree. Wooded dunes, tree-lined river banks, and ground under piers or buildings

herald great locations for their homes. In Wisconsin, antlions are active in warm months when sandy soil is unfrozen. Wisconsin has a handful of antlion species, but only one pit builder, *Myrmeleon im-maculatus*, whose gray and brown cryptically colored body blends with the sandy soils they inhabit. Other species

tend to be darker in color, a brownish gray, and either reside in wood, or live in the sand, also feeding on ants and small insects, but do not build pits and merely hide and ambush their prey.

In sandy areas, antlions are easy to find. Look for a small (1.5- to 3-inch) conical pit up to two inches deep, too perfect for mere coincidence. Chances are good that just under the surface, in the center of the pit, lives an antlion waiting for its next meal. You won't be the only one looking. The small pits are beacons for birds that zero-in and feed on these ferocious little lions. If you find a pit, you can coax an antlion into action. Puff some air or lightly prod the pit with a blade of grass.

Contrary to expectation, the size of the antlion does not determine the size of its pit. Hunger is the driving factor that determines the relative size of the excavation.

After spending much of their larval stage underground, antlions use woody cover as a home during metamorphosis. They create a hollow cocoon within soil or wood that keeps the antlions safe as they pupate. After one month, the adults crawl from the sand being careful not to fall into a neighbor's pit.

Adult antlions with transparent wings and brownish body resemble lacewings and are active only during the evening. In the daytime, they rest motionless trying to avoid predation. The adult phase lasts 30-40 days when the female will tap her abdomen to oviposit eggs that overwinter in soil and woody debris before emerging as snarling sand trappers that can terrorize the ant world for two to three years. ❧

Comforts

Jennifer Haverty



Keep the “wild” in wildlife

As the weather warms and people head outdoors for longer stretches of time, there is more opportunity to encounter wildlife, particularly newborns and young leaving dens and nests. Unfortunately, there are times when well-intentioned people interfere with wildlife, because they incorrectly assume an animal is orphaned or they want to turn it into a pet. Learn to appreciate these experiences in a manner that respects the wild nature of these animals.

JACK R. BARTHOLMAI

Orphaned? Probably not.

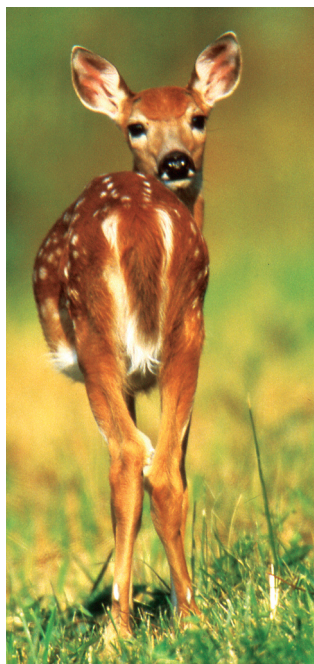
It is common in most wildlife species for the adults to leave their young unattended for periods of time while they forage or hunt to maintain their own nutritional needs. Also, parents minimize time spent at the nest site to prevent predators from easily finding their young.

If you or someone you know picks up a wild baby that is healthy, not orphaned and has been held for less than 24 hours, place it back where it was found. It is a common misconception that human scent on a wild animal will drive the parents away. Keep cats and dogs away from the site and leave the area so the parents will feel safe enough to return.

Not suited for captivity

Wild animals have a place in their natural environments

and are not meant to live a life in captivity. Most wild animals possess an innate fear of



JACK R. BARTHOLMAI

humans, a characteristic which protects them in the outdoors. In captivity, this fear of humans may lead to aggression and injury, as an animal will try to defend itself from what it perceives as a threat. Human interactions and noises associated with human activity may stress a wild animal. On the other hand, captive wild animals may become habituated to and completely dependent on humans, making subsequent reintroduction into the wild impossible.

Wild animals also have complex nutritional, physical, mental and social needs that are not easily replicated in a captive setting. In all animals, particularly young ones that are still developing, failure to meet these needs can lead to serious physiological disorders and even death.

Disease concerns

Wild animals can also carry diseases and parasites that can be transmitted to humans or domestic animals, such as rabies, salmonellosis, canine distemper, mange or intestinal roundworms. Likewise, humans and domestic animals may carry diseases to which wild animals have no natural immunity.

Against the law

Most animals are protected under state and federal laws, making it illegal to take them from the wild without proper permits and authorization. However, citizens may temporarily possess sick, injured, orphaned, or displaced wildlife for up to 24 hours for the sole purpose of transfer to an appropriately licensed individual.

Wildlife rehabilitation

If an animal is truly orphaned

or appears to be sick or injured, you should contact a licensed wildlife rehabilitator immediately. Wildlife rehabilitators are licensed by the state and federal government to temporarily care for and treat wildlife with the goal of releasing them back into their natural habitat. An online directory of wildlife rehabilitators is available at: dnr.wi.gov/org/land/wildlife/whealth/rehab/directory/.

Remember:

- A healthy animal's best chance of survival is to remain with its family in its natural habitat.
- Young wild animals found alone are not necessarily orphaned.
- Wild animals can carry diseases that can be transmissible to humans and domestic pets.
- Human scent on a wild animal will not drive the parents away, so healthy baby animals can often be returned to their nests.
- If an animal is in need, immediately contact a licensed wildlife rehabilitator or the DNR's Call Center (1-888-WDNR-INFO).

For more information on wildlife commonly seen in Wisconsin and tips on determining if an animal is truly orphaned, please refer to the Orphaned Wildlife fact sheet under the Educational Resources section of the DNR's Wildlife Rehabilitation webpage (dnr.wi.gov/org/land/wildlife/whealth/rehab/index.htm). Younger readers can also visit the DNR's EEK! webpage "Leave wild animals in the wild" (dnr.wi.gov/EEK/critter/wildanimals.htm).

Jennifer Haverty is liaison to state wildlife rehabilitators for DNR's Bureau of Wildlife Management.

Traveler

Natasha Kassulke



Summer music to our ears

The Clearing is one of 25 venues where you can enjoy a summer series of classical concerts in Door County.

BILL JACOBS

This year's **Door County Midsummer Music Festival** begins June 11 and continues through July 11 capped by a special Labor Day Series from September 1-6. Not only does the 25-show festival feature top chamber music performers from the region, shows are held in such intimate venues as a 100-year-old boathouse, a Nordic Viking Hall and a church built in 1859. Most concerts are \$25 or \$50. All concerts include a reception and chance to meet the musicians. Visit midsummersmusic.com or call (920) 854-7088.

Just south of Door County, take in the sights and sounds at the **Flying Pig Gallery and Green Space** in Algoma. This art gallery and 15 acres of surrounding natural gardens is creative and sustainable. Visitors enjoy the catch-learn-and-release resident wildlife population. The Flying Pig was Wisconsin's first Travel Green Wisconsin certified retail business to incorporate a geothermal passive solar system. A wetland on the grounds has marsh marigolds, cattails, dragonflies and frogs in a natural symphonic ecosystem with a windmill-powered aeration system. For more informa-



Catch the warm weather and hot fish at Port Washington.

PORT WASHINGTON CHAMBER OF COMMERCE

tion visit theflyingpig.biz or call (920) 487-9902. The Flying Pig is located at N6975 Highway 42 two miles south of Algoma.

Celebrate 46 years of fish and fun on July 17 at **Port Washington Fish Day**. Music, parade, fireworks and arts and crafts festival are held in conjunction with the "world's largest one day outdoor fish fry." Admission is free to the Fish Day grounds. However, to enter the Main Stage area for concerts, you will need a Fish Day button (\$3). Purchase fish and chips for just \$5 at Upper Lake Park. The event kicks off at 11 a.m. Call (920) 994-1104 or visit portfishday.com/schedule.html

Laura Ingalls Wilder Days

comes to Old World Wisconsin in Eagle on July 24-25 from 10 a.m. to 5 p.m. Step into the life of Laura Ingalls Wilder at this hands-on celebration of her life and experiences. Dress like her, try her games and help do Ma and Pa's work, too. Tickets are \$16 adults; \$9 children (5-17), free for children under 5; \$14 students and senior citizens (65 and over); \$43 family (two adults and two or more dependent children 5-17). Then stay later on Saturday, July 24 for an **After-hours Barn Dance** from 6 to 9 p.m. at Old World Wisconsin. Enjoy a rollicking evening of live music and dancing — no prior knowledge required! Another barn dance will be held on September 18. Tickets are \$7 adults and \$5 children 5-17. Call (262) 594-6300.

If gunfire is more music to your ears, you'll enjoy the wild-and-wooly re-enactment of the original **Buffalo Bill's Wild West and Congress of Rough**



Hand-churned ice cream is worth the work at Laura Ingalls Wilder Days.

OLD WORLD WISCONSIN

Riders of the World. The show comes to Circus World in Baraboo July 24-25 from 9 a.m. to 6 p.m. and recreates the time Buffalo Bill's show visited Sheboygan in 1896 with cowboys doing trick riding, roping and shooting. Legendary sharpshooter Annie Oakley will be on hand along with other Wild West adventures including a stagecoach hold-up and a territorial bank robbery. Tickets are \$14.95 adults, \$7.95 children 5-11, and \$12.95 senior citizens (65 and older). Circus World is located at 550 Water Street, Baraboo. Call (866) 693-1500 or visit circusworld.wisconsinhistory.org

Side up to animal acts, ropin' and ridin' at the Buffalo Bill show.



CIRCUS WORLD

Natasha Kassulke is creative products manager for Wisconsin Natural Resources magazine.



Wisconsin, naturally

BLUEBERRY TRAIL STATE NATURAL AREA

Notable: Blueberry Trail features a relatively undisturbed floodplain forest along a meandering, free-flowing stretch of Beaver Creek.



The steeply-banked stream is deeply entrenched in sand and carries a heavy load of acidic tannins, which stain the water a rich, tea-like brown. Dominant trees are river birch, oak, pine and red maple. In places, the forest grades into sedge meadow, tamarack swamp and white pine-red maple swamp; a community type restricted to the central sand plains region. Common understory plant species include huckleberry, cinnamon fern and bluebead lily. Among the resident birds are Louisiana waterthrush, whip-poor-will, golden-winged warbler and scarlet tanager.

How to get there:

Within the Meadow Valley Wildlife Area. From the intersection of Highways H and 173 in Mather (Juneau County), go south on 173 for 1.8 miles, then southeast on Crescent Road 4.4 miles, then east on Drake Avenue/Mulloney Road 1.2 miles. The natural area lies on both sides of the road. See dnr.wi.gov/org/land/er/sna/index.asp?SNA=577 for a map and more information.

