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[Madison, Wisconsin]: Wisconsin Department of Natural Resources, October 2005

Center poster: Recycle when you travel

WISCONSIN NATURAL RESOURCES

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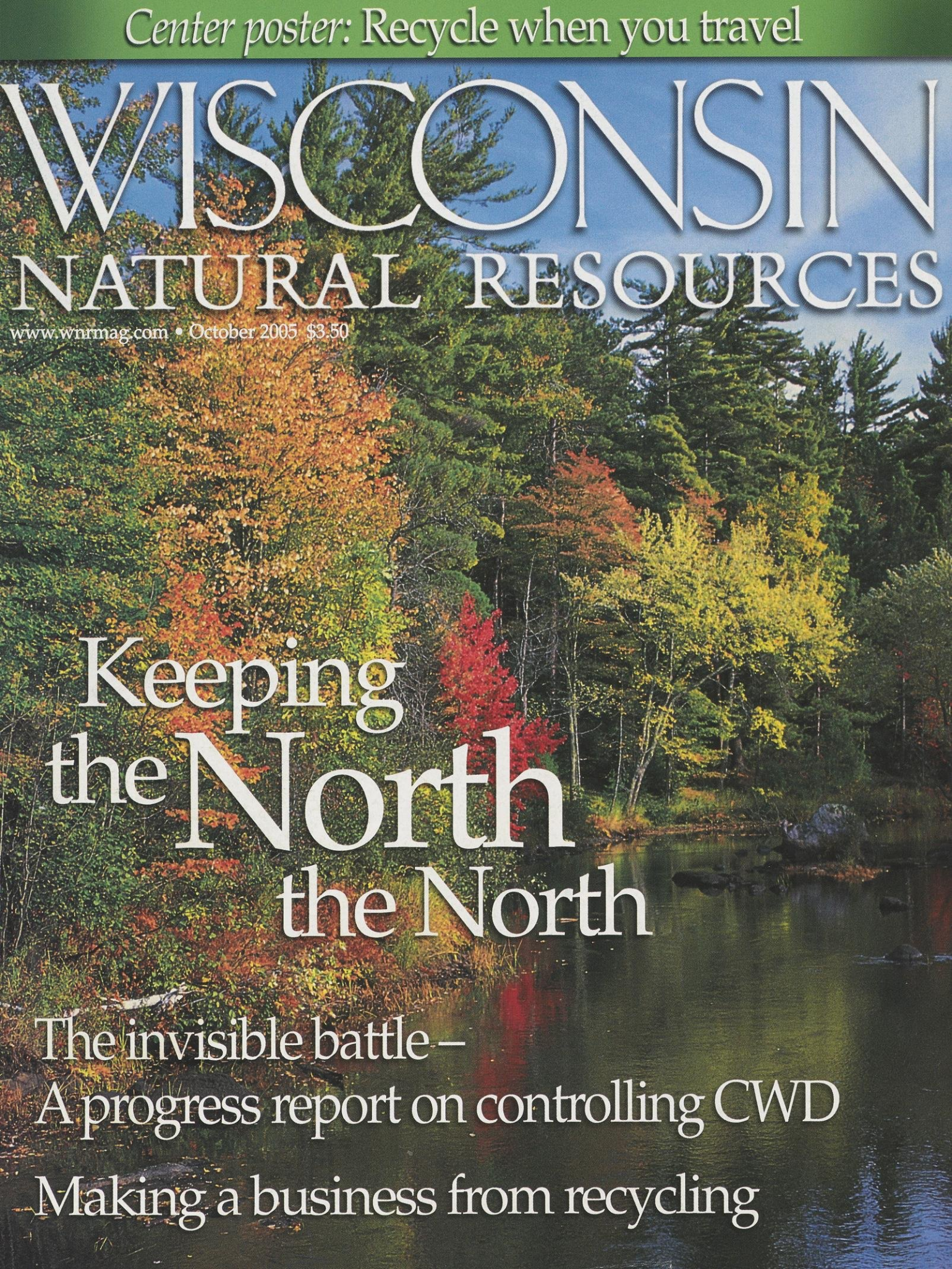

Keeping the North the North

The invisible battle – A progress report on controlling CWD

Making a business from recycling

A light touch and hairy toes help these bugs stride across the water.

A walk on the wet side

Anita Carpenter

They skate gracefully on thread-like legs over glass-smooth water. From spring into autumn, water striders glide back and forth, here and there, on the surfaces of quiet ponds and slow-moving streams.

Water striders belong to the insect order Hemiptera (true bugs) and the family Gerridae. Of the 45 to 60 water strider species in North America, about 12 call Wisconsin home. The slender, dark-colored insects range from a half-inch to an inch long. Females are generally larger than males.

Continued on page 29

The lightweight strider stays afloat on hairy legs that repel water. Two short front legs are used to grab prey. The middle two legs are used for rowing and two long back legs are used to steer like a rudder.

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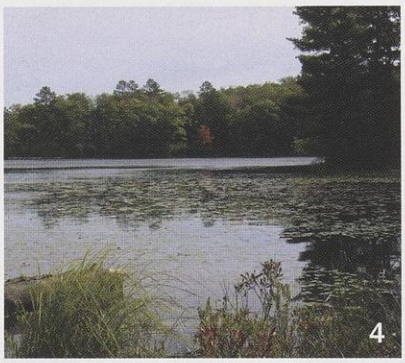

LARRY G. NELSON

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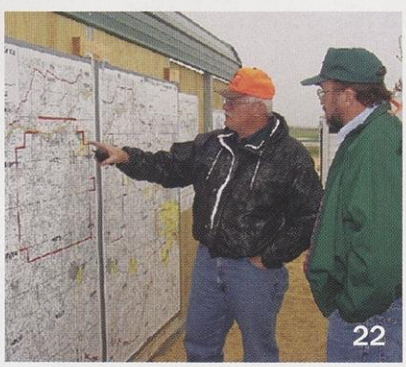

DNR PHOTO

FRONT COVER: A quiet fall moment on an Iron County stream. See our story on preserving the feel of northern Wisconsin experiences starting on page 4.
DON BLEGEN, SPRING VALLEY

BACK COVER: Ferry Bluff State Natural Area along the Wisconsin River in Sauk County. For more information, contact the State Natural Areas Program, Bureau of Endangered Resources, DNR, P.O. Box 7921, Madison, WI 53707 or visit www.dnr.wi.gov/org/land/er/sna.

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Keeping the North the North

David J. Daniels, Mark Stokstad, James C. Bishop, Jr., Larry G. Nelson and Lisa Gaumnitz

A decade in the making, the Northern Initiatives still point the way toward reasoned development that sustains the character of the Northwoods.

Development, especially home building, on Northwoods lakeshores, riverbanks and forests continues at a stunning pace, changing the look of the landscape and the rate of runoff to woods and water. Since the 1960s, two-thirds of previously undeveloped lakes 10 acres and larger now have some buildings. The average number of dwellings on northern Wisconsin shoreland that is not in public ownership has more than doubled in the same period.

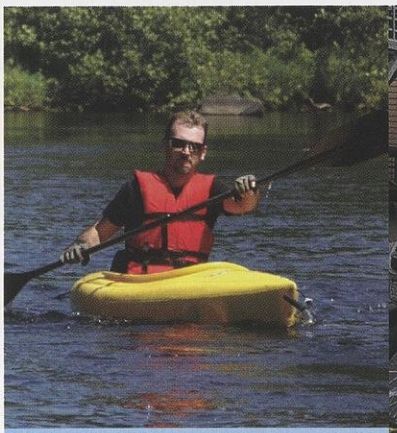
Just how do you preserve the character and flavor of "the North?" That's the question we were asking in the late 1980s and early '90s in the face of sweeping change across the region. Tribal treaty rights challenged long-held views of fisheries. Dot-com retirees and the booming national economy made lakefront property and undeveloped forestlands hot real estate. Overseas firms started buying up Wisconsin's commercial forests. For the first time in decades, the prospect of mining loomed in several northern communities — a potential boost for local economies but a possible bust for the environment.

Whether you viewed the Department of Natural Resources as protector of the region's unique attributes or the gateway to growth, the agency stood smack in the middle of this perfect storm.

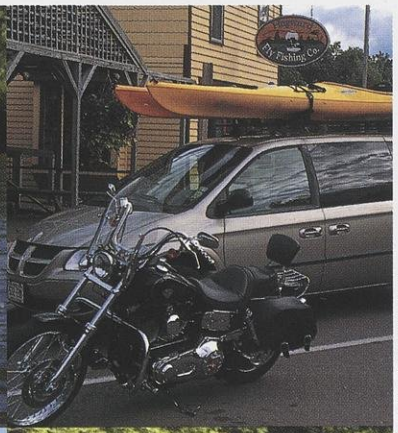
Out of this change was born the Northern Initiatives, a two-year dialog with the public to guide the Department of Natural Resources in managing resources in the northern third of the state.

"When we started the process back in 1994, it was absolutely critical that people who live in the North craft the plan that would guide the North," said Bill Smith, DNR deputy secretary and former director of the DNR's Northwest District and Northern Region. In all, more than 1,000 citizens participated in 20 town meetings and listening sessions. Many more people filled out questionnaires.

The result? According to Smith, the plan that guided DNR management in the ten-year period from 1996-2006 became a map to help define a vision of the North, and a compass instrumental in pointing the way for the Department of Natural Resources and northern communities to work together on issues of common interest.



VILAS COUNTY



JAMES C. BISHOP, JR.

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Increasing kayak, cycle, ATV and bike use create both opportunity and demand — opportunities for business that serve the recreation needs of residents and visitors; demands for launch sites and trails; competition among different groups to use the same routes.

The Northern Initiatives have been fine-tuned, but have remained remarkably constant over the ten-year plan. During initial listening sessions, people told us to balance a strong economy with ecological and social values. They said preserving the northern character and enhancing economic growth without sacrificing the vitality of the environment were key goals. They encouraged us to guide by providing incentives for long-term stewardship of the North's resources.

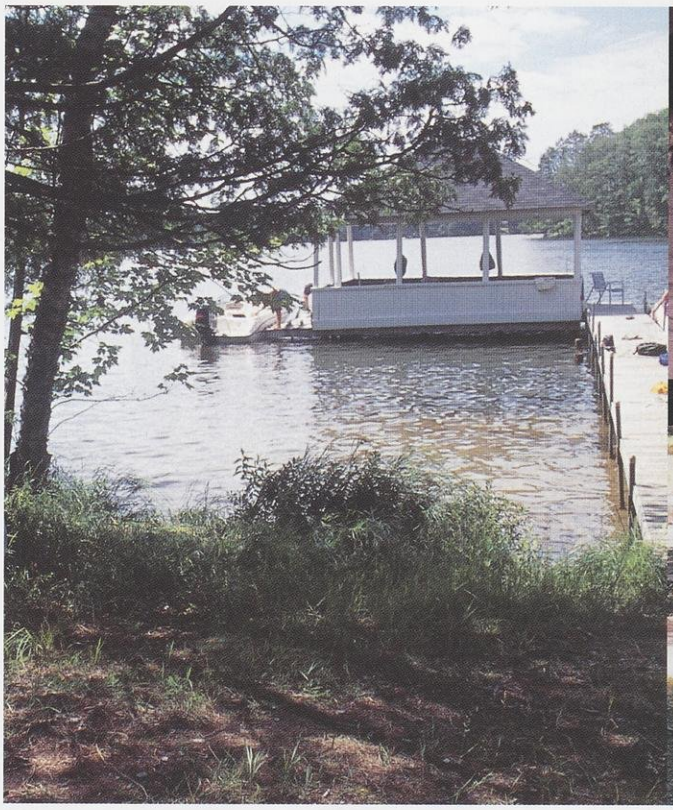
Some issues died early, others are still emerging

Mining issues were the first to play out. The Flambeau Mine at Ladysmith closed and reclamation was accomplished without a significant environmental issue. Plans to open a zinc and copper mine at Crandon have been shelved. While environmental monitoring is ongoing at Ladysmith, metallic mining is not an active concern for Wisconsin.

The concept of a northern trails network continues to grow and diversify. Many communities are expanding bicycle trails, and links are being developed between communities. Mountain biking trail networks are growing as well. Cycling and kayaking enthusiasts flock to the North in increasing numbers, and progressive tourism businesses provide more of the services these paddling and pedaling customers seek.

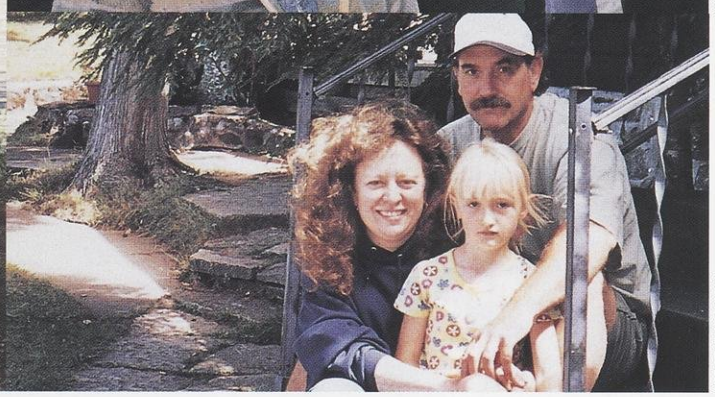
We're seeing tremendous change in motorized recreation. Wisconsin now registers more ATVs than snowmobiles. The proposed master plan for the Northern Highland-American Legion State Forest includes an experimental ATV demonstration site and a statewide ATV policy on state lands was drafted last January.

ROBERT KORTH



KATHERINE ESPOSITO

KIRSTIE LARSEN



KIRSTIE LARSEN

What should the North accommodate? There's tension from private landowners to extend their reach into public spaces, like this illegal gazebo. We need to strike a balance that will support those who live and work in the North while maintaining quality resources that attract visitors, says Jodi McMahon of the Manitowish Waters Chamber of Commerce (top right). Some visitors still appreciate simple, relaxed, quiet Northwoods settings, say Kim and Tim Bowler, who operate the Alpine Resort on the Presque Isle chain (bottom right).

Growing interest in ATV riding brings many issues. Outdoor enthusiasts who cherish quiet surroundings are concerned these conditions may soon be a memory. How can we provide places for ATV enthusiasts while sustaining the traditional peace and quiet of the North? No block of land can be all things to all people.

The issue of one-stop regulatory shopping is regularly hammered out and reshaped at the State Capitol. Recent legislation and many projects underway test how to streamline regulatory processes while maintaining the quality of Wisconsin's environment. Northern industry leaders and regulatory staff are fully engaged in this important effort.

People involved with Northern Wisconsin's leading industries — tourism and forest products — have a deep stake in sustaining these enterprises. Tourists delight in the beauty of our shorelines, brilliant night sky and remarkable quiet. Forest products industries require a dependable flow of materials from large, productive forests. But land ownership patterns are rapidly changing. Some companies owning large blocks of forestland are divesting these assets, providing wonderful opportunities to acquire very special lands for public use and preservation. Yet many large blocks of forest are being broken up and developed for homes and subdivisions. These parcels take on a more suburban character than the traditional northern forest.

Can the northern character survive our enthusiasm for it? Can we strike a balance between economic development and preservation that will support those who live and work in the North while maintaining the quality resources that attract visitors?

Jodi McMahon, director of the Manitowish Waters Chamber of Commerce, suggests we first need to understand what we want our community to be, then encourage development of businesses and recreational activities to fit the character of our area. "We need to be strategic in every land management and land use decision," she said.

Manitowish Waters faced just such a decision in 1995 when the Statehouse Lake Youth Conservation Camp closed. The site could have been sold and developed, but local leaders banded together, kept the property intact and formed the Northern Lakeland Discovery Center. This beautiful traditional Northwoods site, now a valued community asset, provides recreation and educational programs. It's a great fit for the Town of Manitowish Waters.

Tim and Kim Bowler at the Alpine Resort on the Presque Isle chain of lakes have stepped up to the challenges of sustaining a traditional Northwoods resort business. They have made substantial investments to assure their resort has the least possible environmental impact. They educate their guests, as Kim says, "to be polite visitors to the North." Many of their guests are more accustomed to high-intensity entertainment and need to learn how to vacation in simpler, relaxed, quiet Northwoods settings. "The demographics are changing," Kim says. "We need to look at what people want, to tap the markets."

Sustaining big blocks of forest

The Northern Initiatives recognized that vast, contiguous forests are a major draw and asset to the northern experience. The 18 counties in Wisconsin's northern tier hold three-fourths of all state- and county-owned forestlands, nearly all of the Chequamegon and Nicolet National Forests, and about 40 percent of the private forestlands. The region accounts for more than half of the 16 million acres of commercial woodlands in the state.

Northern forests provide recreation for residents and tourists as well as timber for 1,850 companies in Wisconsin. Many assumed these lands would remain commercial forests for decades, but economics at home and abroad are altering that assumption. Land prices are rising and woodlands are sought for retirement homes and weekend retreats. Overseas firms purchased many Wisconsin paper and timber businesses, and have sold large parcels of land. The land sales quickly can convert big blocks of timber into cabin woodlots. Two hundred-acre parcels divided into five 40-acre parcels and further subdivided provide profit on each sale. As development chips deeper into the forest, the demand to extend roads and utilities to new homes puts pressure on communities to raise taxes. And as taxes increase, those landowners trying to maintain forest are strapped to pay the yearly tax bill, creating yet more pressure to sell.

With each sale, the wild flavor of the North changes and forest management becomes more fragmented. Between 1984 and 1997, private ownership of wooded parcels increased by 20 percent and continues to rise. Adjoining landowners often have different ideas of how to manage their small woodlots. Providing professional services for greater numbers of woodland owners is a challenge for foresters and timber mills alike, who were accustomed to dealing with fewer owners who managed much larger tracts of land.

The public also has a stake in sustaining larger forest parcels. Lands once accessible for recreation are being closed off. When a forest products company sold its holdings a few years ago near the Willow Flowage in Oneida County, a popular ATV trail closed and the new private landowner discontinued public access for hunting.

JAMES C. BISHOP, JR.

As forest parcels are sold, divided and developed for homes, communities are challenged to provide fire protection, provide roads and utilities, maintain recreational access, sustain productive timberlands and maintain wildlife habitat.

Through direct purchases, easements and timber certification, the public still has a few tools available to supply fiber to the mills and maintain space for public recreation.

Direct purchases are made from willing sellers, such as the "Great Addition" back in 1999 when Packaging Corporation of America sold the state 33,000 acres of forest from a total sale of 161,000 acres of timberland. Land trusts and organizations like The Nature Conservancy also buy land outright or offer landowners options to protect, manage and maintain their forestlands.

Conservation easements purchase future development rights instead of buying the land itself. More than 100,000 acres of land are currently protected in the state through conservation easements.

Certification takes a different strategy to protect forests and increase the value of forest products. Certified forests are evaluated using internationally recognized standards to ensure the land will be maintained as healthy, productive timberlands, provide wildlife habitat, and protect water quality. Wood and other products sold from certified forests earn a premium price. All of Wisconsin's state and county forests have been certified, and two million acres of private woodlands enrolled in the Managed Forest Law program also meet certification requirements.

Mike Luedeke, a forester in DNR's Northern Region, says certified forest lands make Wisconsin's wood products more valuable in the global marketplace where consumers worldwide demand wood fiber that has been grown using practices sensitive to environmental, ecological and social issues.

At water's edge

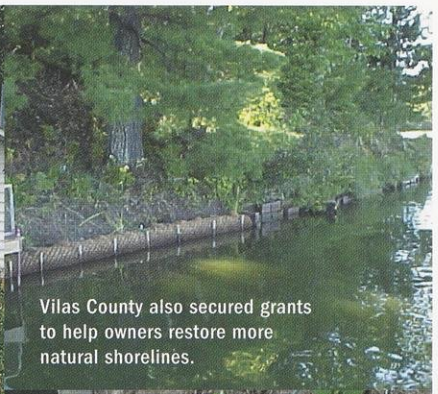
When 90 percent of those surveyed for the first Northern Initiatives study said they were "somewhat" or "very" concerned about shoreline development, the department and partners responded with approaches to cover the waterfront.

"The Northern Initiatives process increased awareness of the importance of the shoreland area tremendously," says Myron Schuster, former administrator of Burnett County and now executive director of the Northwest Regional Planning Commission. "Now it's starting to bear fruit."

Counties, already frustrated in carrying out shoreland rules people found confusing and rigid, started revising local standards. Many drew on DNR staff expertise and grants to fund studies to sort out which lakes, rivers and streams would be most vulnerable

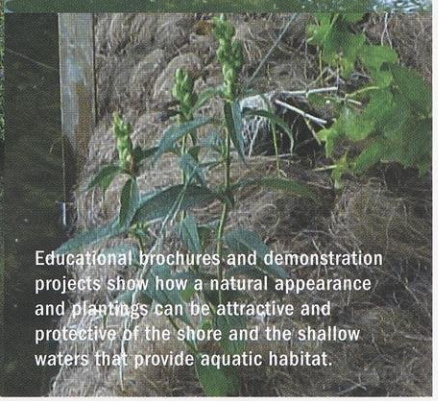
Burnett County offers financial incentives and technical help to shoreland owners to maintain or establish a buffer of natural vegetation along the shoreline. Dave Ferris, (left) county conservationist, helps owners make plans and contact certified landscapers.

JAMES C. BISHOP JR.



Vilas County also secured grants to help owners restore more natural shorelines.

VILAS COUNTY



Educational brochures and demonstration projects show how a natural appearance and plantings can be attractive and protective of the shore and the shallow waters that provide aquatic habitat.

VILAS COUNTY

if developed.

By 2000, all 72 counties had beefed up the standards in some way. Many counties increased minimum lake lot sizes and increased the distance new buildings needed to be set back from the water's edge. Nearly all counties tightened limits on removing native plants next to the water or started requiring property owners who wanted to expand their homes to restore a 35-foot wide natural buffer between the shoreline and their construction project.

Such efforts to strengthen and clarify shoreland standards are just a starting point. Other voluntary and educational approaches are bringing even more encouraging results, Schuster says.

"We decided if we kept doing the same thing, we'd end up with the same results," Schuster says. As the development steamroller from the nearby Twin Cities area headed its way, Burnett County shifted course.

Rather than hire more staff to enforce ordinances, Burnett County focused on getting a tax incentive program going. Property owners who voluntarily signed restrictive covenants to keep a 35-foot-wide natural buffer next to the water in perpetuity received a one-time stipend and a $50 annual tax credit thereafter. They also received a T-shirt and signs to advertise the incentive program.

County employees work with property owners to develop landscaping plans, pick out plants for their restoration projects, and make return visits to assure the property owners are meeting their obligations, according to Dave Ferris, Burnett County's conservationist and head of the Land and Water Conservation Department. Funds from state agriculture and natural resource departments share the county's cost of providing tax credits to property owners who buy and start native plants.

Both men regard the program as a huge success. Since its start in 1999, some 519 parcels have either been restored or left as natural shorelines.

To further jump-start the program, Burnett and Polk counties teamed up for workshops to show landscaping firms how to get certified to carry out shoreland restorations. Information packets are still sent to all new waterfront landowners to help them understand the critical importance of shorelands for clean water, good fishing and natural scenic beauty. Demonstration sites on public lands helped demystify shoreland restoration and ease people's concerns. "Changing attitudes is a big part of the program," Ferris says. "Most of the people with lakeshore homes come from big cities. Their concept of a lakeshore lot is a manicured bluegrass lawn down to the water's edge and a tree with no branches near the ground."

Vilas County Conservationist Patrick Goggin faces the same educational challenge in a county with more than 1,000 lakes. The land and water conservation department he directs has received $30,000 to $50,000 in agriculture department funding for about five years to share property owners' costs of restoring natural buffers.

There are always more applications than funding, Goggin says, but the county offers resources to property owners and lake associations willing to go it alone. Handouts offering suggestions are distributed at the county zoning office, realty offices and to lake groups.

Some developers voluntarily adopt setbacks, lot sizes and other practices to protect shorelands. "Development is going to happen," says Buzz Sorge, DNR lake planning specialist. "There are different ways to get the same objectives accomplished that you do through ordinances."

When DNR studies showed that

Loon Lake, a small shallow water in Chippewa County, was home to several rare species and would be very sensitive to increased runoff, Sorge worked with developer Naterra Land to alter its lakeshore project.

"We'd been looking for a way to develop that's more environmentally friendly, showed common sense, and used low-tech approaches that we can understand and that our customers can understand," says Steve Roman, Naterra's executive vice president.

The result was protective covenants binding the purchaser and successive owners to protect the shoreland. No buildings or structures can be closer than 100 feet to the water, there's a no-mow zone next to the water, septic systems can't be located closer to the water than 75 feet, and rain gardens are mandatory.

"It hasn't slowed our sales down and it should make it easier for us to get approvals for our plats," Roman said. As of the end of May, nearly two-thirds of the lakefront lots had been sold at prices ranging from $49,950 to $106,950.

Wild Lakes

Northerners especially want to save and savor some of those truly wild places in the region. Since the 1960s about two-thirds of the remaining undeveloped lakes larger than 10 acres have been developed. The average number of dwellings on privately-owned shorelands has doubled in the last 40 years, and trends indicate all the undeveloped northern lakes not currently developed could be developed by 2015. Some of these rare gems are being preserved and permanently set aside.

Through 2003, the Wild Lakes program has protected 38 named lakes, 10 unnamed lakes and parts of eight other lakes.

Recently the West Wisconsin Land Trust negotiated with Brunkow Hardwoods Corp. to purchase 2,780 acres of undeveloped land in Polk County. The company was willing to drop the asking price on the land by $2 million — enough so combined funds from the Knowles-Nelson Stewardship Fund with money from the national Ice Age Trail Foundation could support the purchase.

"We always wanted the property to be conserved as a park and as a segment of the Ice Age Trail, but it took the West Wisconsin Land Trust to bring this deal together," said company president Bob Brunkow.

The property may become a wilderness park/wildlife area and has the largest contiguous segment of the Ice Age Trail. It contains over 800 acres of old-growth hardwoods, a 107-acre wild lake, vast undisturbed wetlands, rolling prairies, and the largest population of cerulean warblers in the state.

Other partners in Wild Lakes purchases include the Trust for Public Lands, the U.S. Forest Service, the Bayfield Regional Conservancy, The Nature Conservancy, the Last Wilderness Conservation Association, and Gathering Waters Conservancy.

The Nature Conservancy joined with the department in the purchase of the Catherine Wolter Wilderness Area in Vilas County. These 2,189 acres contained 15 wild lakes and ponds. The Conservancy also helped purchase the 1,043-acre Caroline Lake Preserve in Ashland County, the Holmboe Conifer Forest in Oneida County, and 26,000 acres in the Chequamegon Bay watershed. The latter includes parts of the Apostle Islands, Chequamegon Point, and the Kakagon/Bad River Sloughs.

Other lands are set aside using conservation easements. The landowners keep the rights to sell the property, farm, hunt, restrict hunting, transfer land to their heirs, and limit access to the land; only development rights are restricted. Conservation easements appeal to landowners because they are voluntary, flexible and efficient. If the easement meets certain Internal Revenue Service requirements, it may offer substantial income, property and estate tax savings to the landowner.

Wild rivers

A spin-off of the Northern Initiatives is the identification of stream and river corridors that especially deserve protection. Nearly 1,500 rivers and streams in northern Wisconsin have been assessed and people's attitudes surveyed. Citizens tell us their top concerns for these riverbanks and streambanks are housing construction, water pollution and declining fish populations, followed by crowding, farm runoff, erosion, access to the water, user conflicts and artificial changes in the water flow.

LARRY G. NELSON

The 23-acre Happles Lake nestled in the Bayfield County portion of the Chequamegon National Forest is one of 58 waters protected as a wild lake. A partnership among governmental agencies, land trusts and conservancies buys properties and development rights to preserve lakes and shorelands.

Dave Ferris thinks it will take a greater commitment from all levels of government to stop the incredible pounding all of the Northern Initiatives issues are receiving from more intense development.

"State government as a whole needs to take the long-term view that we have to protect this for generations down the road instead of providing for the immediate gratification of individuals who want this today," Ferris says. "I like what Gaylord Nelson said: *The ultimate test of man's conscience may be his willingness to sacrifice something today for future generations whose words of thanks will not be heard.*"

That's the spirit the Northern Initiatives brought to the decade past and will carry forward.

David J. Daniels is a planning analyst for the Northern Region's facilities and lands program based in Rhinelander. Mark Stokstad recently retired as the Air & Waste Team Leader for DNR's Northern Region based in Rhinelander. James C. Bishop, Jr. is the public affairs manager for the Northern Region in Spooner. Larry G. Nelson supervises field operations for the Northern Region fisheries and habitat team based in Spooner. Lisa Gaumnitz is DNR's public affairs manager for water programs based in Madison.

Feeding good habits

Recycled paper fiber is an important component of tissue grade papers as well as brown paper towels and copy paper. Georgia-Pacific's mills recycled 765,000 tons of paper materials last year.

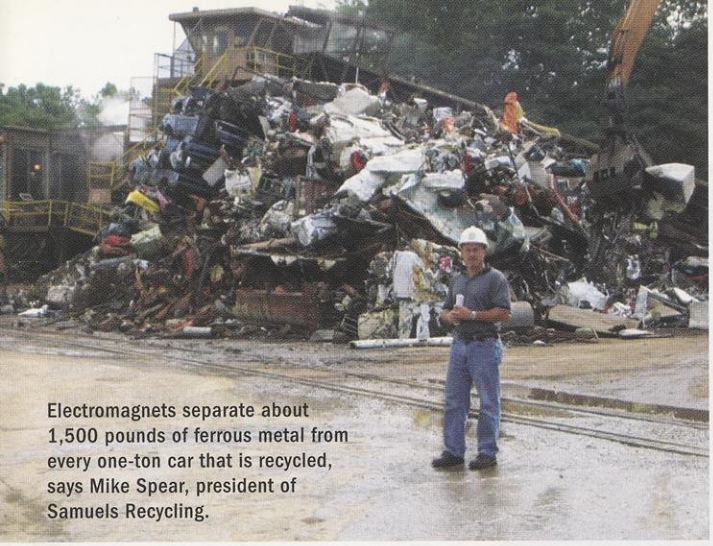
Meet some companies with new ideas and new approaches to building businesses from recycling.

Natasha Kassulke and David L. Sperling

A decade ago recycling became the law of the land in Wisconsin and now it's second nature for homeowners and renters to separate usable materials from the "trash" each week on Garbage Eve.

While changing people's wasteful habits remains a challenge, the businesses that process and return recyclables to the marketplace face a whole different set of issues: Can they collect, separate and sell materials economically? Can they make recycling pay or is it just the right thing to do?

On this tenth anniversary of our recycling law, we visited a mix of firms around Wisconsin that recycle paper, metal, glass, electronics, plastics and construction materials. These bright people showed us where the recycling business is moving and what we can do to bolster it. Here's what we heard.



Electromagnets separate about 1,500 pounds of ferrous metal from every one-ton car that is recycled, says Mike Spear, president of Samuels Recycling.

SAMUELS RECYCLING COMPANY

Spear sees China as an important growth market for metals recycling firms in the next 15-20 years. U.S. firms have a lot of know-how to recycle metals; that know-how can be applied overseas, Spear believes.

SAMUELS RECYCLING COMPANY

Go deeper into the trash can

Headquartered in Atlanta, GA, Georgia-Pacific Corporation is the world's largest producer of tissue products (bath tissues, paper towels and napkins) including such popular brands as Brawny paper towels and Northern bath tissue products.

Georgia-Pacific's two Wisconsin mills in the Green Bay area use recycled paper to make most of their products. The company purchases waste paper through a subsidiary supplier based in New York that buys office paper and magazine waste across the United States. Georgia-Pacific used 665,000 tons of recycled material last year, including fiber from the City of Green Bay's curbside pick-up program.

Recycled paper is de-inked, mechanically and/or chemically broken down, cleaned and screened to recover usable fiber. The finished pulp is used to produce brown and white paper towels, napkins and tissue grades.

Georgia-Pacific purchased Fort James Corporation in 2000 which included a James River plant (now called the Day Street mill) and the Fort Howard Corporation plant (now called the Broadway mill). Its Broadway mill started recycling in the 1930s; the Day Street mill, in the early 1990s.

Research at the company's Neenah Technical Center focuses on ways to make high quality tissue, towels and napkins from the lowest cost waste products. One complication has been finding ways to remove sticky material found on envelopes and items like papers where credit cards were attached for mailing.

"We are researching ways to get the glue out by screening it and cleaning the paper," says Eric Woolums, technical operations manager for Georgia-Pacific Corporation in Green Bay.

The company works with printers and buys some high-grade papers seasonally, like outdated copies and overruns of annual reports that peak from January to March. "We purchase ahead of time when supplies are plentiful," Woolums says.

International competition for waste paper is a challenge. "A lot of materials are being exported to China because they will pay a premium price," Woolums says. "As people use computers more and work toward paperless office environments, the U.S. doesn't print as much as we used to."

The company also runs a waste paper handling center, Ecosource. Once a year on Earth Day, Ecosource hosts an open house and invites the public to bring in their waste paper, tour the facility, and learn about the importance of correctly sorting waste.

Georgia-Pacific employs about 3, 500 people in Green Bay and collects bottles, cans, paper and polywrap for recycling. Since 1989, the mills have donated $110,000 to local charities from aluminum cans collected at its Green Bay plants.

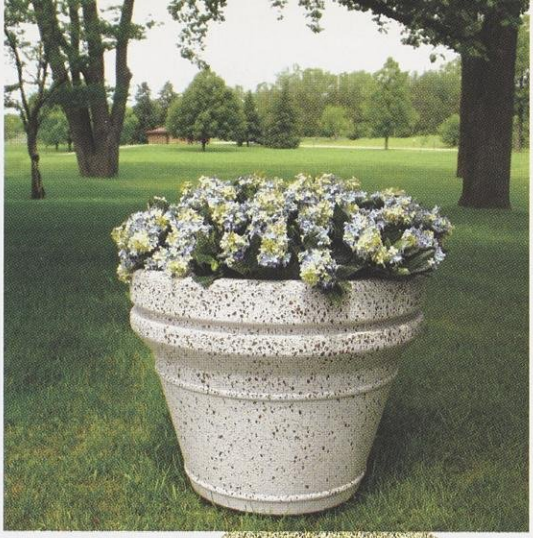
"To remain competitive," Woolums says, "we are going deeper into the trash can to get as much quality fiber out of it as we can."

Watch closely overseas, keep it stable at home

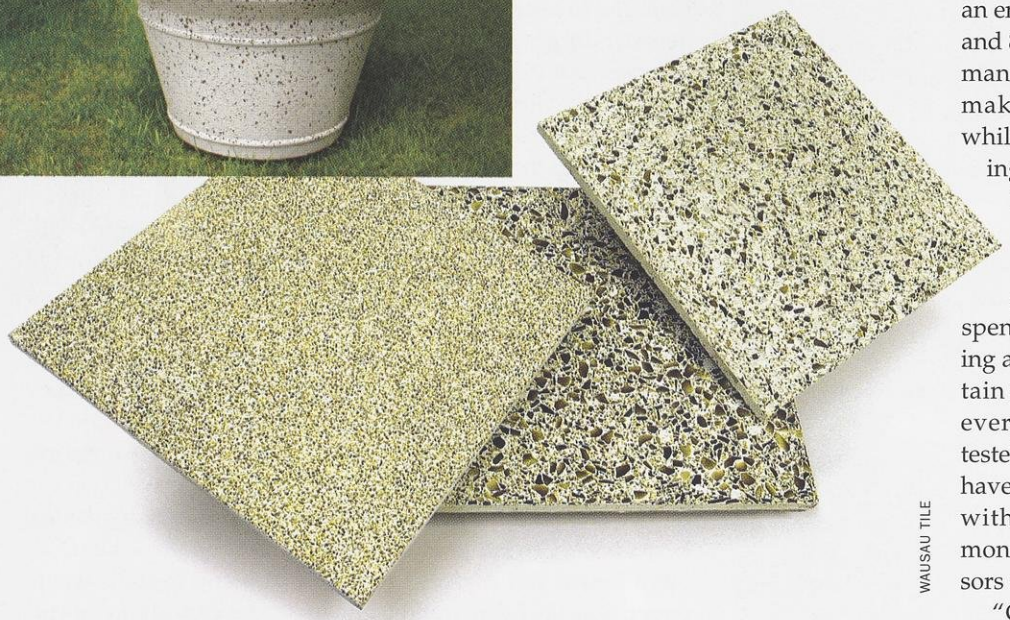
Samuels Recycling, a family-owned Wisconsin business since 1896, recovers scrap metals — iron, steel and nonferrous metals like aluminum, brass and zinc — at seven Wisconsin locations in Madison, Green Bay, Janesville, Waupaca and smaller processing yards in Beaver Dam, Waupun and Portage. The scrap metal business is a vital partner in recovering metals from old automobiles, foundries, industrial scrap and from private customers who haul in old pipes, scrap and farming equipment.

"We are metal recyclers. We function in the recycling 'food chain' to break down products into forms of metal that can be melted by somebody else," explains company President Mike Spear.

"Our customers are widespread. Most of the foundries are in Wisconsin; steel mills are out-of-state in Indiana, farther east and in Canada. Overseas markets in China, India, Korea and Japan are primarily buying our copper, brass and aluminum that can be shipped in containers," Spear says. "These customers would likely take our steel too, if we could get it there economically. Now they buy from scrap dealers on the



Colorful tiles incorporate recycled glass to give flooring a dazzling sparkle and add splashes of color and texture to other products like outdoor planters.



WAUSAU TILE

coasts, but we're building markets. Some steel from Chicago travels by barge downriver to New Orleans and then overseas to Turkey and China.

"We employ about 250 people at our seven facilities. Our volume is 50-100 percent higher today than 10 years ago, yet we can operate with slightly fewer employees thanks to their efficiency and technology. That's important as we consider that our competitors in China have labor costs as low as a dollar a day. Our machines are sophisticated; they use electromagnetics and detect differences in metal conductivity (eddy currents) to separate the components.

"For instance, the lightweight cars we shred today weigh about a ton. Electromagnets will pull out about 1,500 pounds of iron and steel. Other technology separates about 50 pounds of nonferrous metals like copper, brass and aluminum. The remaining 20-25 percent of that weight is 'fluff' — cushions, glass, vinyl and plastics that are currently landfilled, but someday may be usable. To give you an idea of scrap volume, our company ships several thousand tons of iron and steel monthly, and the nonferrous metals are shipped in 40,000-pound containers. We export at least a million pounds a month to China alone.

"We're watching the China market evolve," Spear says. "They're building infrastructure, power plants and manufacturing, and they're getting smarter all the time. In the next 15-20 years, I believe China will continue to grow and many jobs will be created. As they make more things and make enough money, the Chinese will be buying more of the Fords, Buicks and Chevys. *They* will be the ones building houses, and after that, *they* will be the ones discarding the metal. *They* will be the world's biggest generator of scrap metal. Right now it's still the U.S. We're still the ones with all the cars and the toys, and we're still the people throwing it all away. We've got a few hundred million people. They've got 1.6 billion people, and once they all have houses, cars, motorcycles, shopping carts, cans and whatever, they'll be generating a lot more scrap than we ever did. And somebody's going to have to be there to process all that scrap, like we do.

"Most people say we are entering the Chinese Century. We still have the technology here in the U.S. to recycle these materials. Firms that figure out how to take that know-how and apply it to the rest of the world will be viable businesses in the future. Those that just sit here and do it the same way, over and over will die.

"What incentive do we need? From an environmental standpoint, in the 70s and 80s we cracked down in the U.S. on manufacturing and anybody who was making smoke, dust or dirty water while the rest of the world was polluting the heck out of the environment. That process made the 'good guys' clean their act up and do things right. Those that chose not to go along with it are gone now. We spent millions pouring concrete, pouring asphalt and contouring land to contain stormwater runoff. We looked at every bit of land at our facilities. We tested and removed 'bad dirt' that may have been there since 1910. We worked with the DNR, and it cost us a lot of money to clean up what our predecessors were unaware of.

"Going forward, to compete, we need continued cooperation with regulatory agencies. We need people who understand our business, who can continue the relationships it has taken us 20 years to build. The way state government has continued to cut funding and staff, we're dealing with new people every few years, and that hurts. Government needs long-term people who know the game."

Innovate with new product ideas

When Edward Creske founded Wausau Tile in 1953, he valued innovation. Today, the company still operates with that same value under his son, Bill.

"We began working with an engineering professor at Columbia University about six years ago to develop glass-concrete technology," Bill Creske says. "As a result of that collaboration, today we manufacture products with recycled glass in aggregates that create textured materials and appearance."

Wausau Tile's products are manufactured in a 400,000-square-foot, state-of-the-art facility in Wausau. The company employs about 330 people producing concrete furnishings including waste containers, tables, benches, planters,

bollards (heavy posts), signs, playground amenities and terrazzo tile. The company's pavers and terrazzo tiles use recycled glass. Production of big bollards and planters using recycled glass ramped up post-9/11 to enhance security at stadiums, public and private buildings.

Wausau Tile purchases about 200 tons of glass annually from suppliers in Indiana, Arizona and Tomahawk, Wisconsin. The Tomahawk facility buys much of its glass from the Langlade County landfill and curbside pickup. Wausau Tile works closely with its suppliers to establish price guarantees and a uniform product flow, says Commercial Division Manager Rodney Dombrowski.

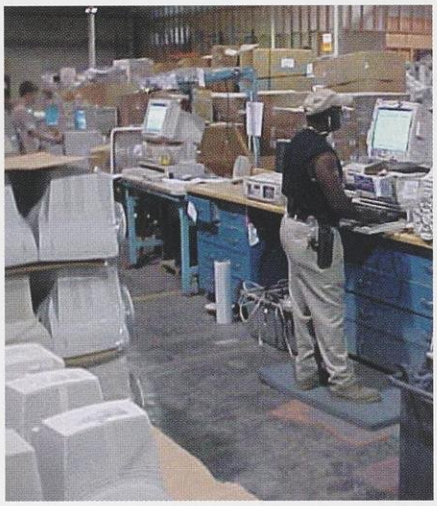
While it has taken some time to convince people that the highly polished flooring they are walking on is glass, and it isn't sharp, Consumer Division Manager Rob Geurink says customers are coming to appreciate the color options — blue, green, clear, brown and red — that glass adds to the traditional terrazzo flooring. "These tiles have an iridescent and refractive look," Geurink says.

"We've put recycled glass on the forefront by putting it out there in terrazzo floors and in planters," Dombrowski says. "Using these products makes an architectural and environmental statement."

Expand consumers' horizons about what is recyclable

5R Processors, Ltd. recovers components from consumer electronics like computers, peripherals, office equipment and cell phones as well as utility equipment and machinery (like grinders, lathes and pumps). The firm operates three receiving centers in northern Wisconsin at Glen Flora, Catawba and Ladysmith as well as in Syracuse, NY; sorting "triage" centers in Atlanta, GA, and Memphis, and a processing facility in Clinton, TN.

The business started in the late 1980s in Wisconsin recovering metals, alloys and mainframe computers. As the use of home computers and other equipment increased, the company developed expertise in dismantling home, business and industrial electronics. "We can take apart almost anything with a plug, (other than fridges, stoves and big home appliances)," says Executive Vice President Karen Birkenstock.



5R PROCESSORS

Electronic products like computers are disassembled and "demanufactured" to recover circuit boards, motors, metals and other components. "We view ourselves as 'end of life' processors for electronics," says Karen Birkenstock, executive vice president with 5R Processors, Ltd. that operates three receiving centers in northwest Wisconsin.

"If the client allows it, we reuse equipment for its intended purpose first. If not, or if equipment is proprietary, we will disassemble it," she says. "We view ourselves as 'end of life' processors for electronics. We don't smash and grind products to form a comingled mix of plastics, wires, glass, resins and metals like lead, mercury and cadmium. In taking apart devices like computers, we don't generate any wastes because we demanufacture and separate components by hand," Birkenstock adds.

Once hard drives are wiped clean, some computers can be refurbished for reuse for schools or other resale. Otherwise, 5R carefully disassembles electronic devices so components like hard drives, circuit boards, fans and motors can be reused or recycled. These pieces are all bar-coded and tracked before they are marketed to businesses in the Midwest and eastern U.S. Nearly 10 million pounds a year of electronic components are reclaimed by 38 employees in the Wisconsin facilities alone, says Birkenstock.

"For our future, it would help to have support and funds for research and development to try new processes and products," Birkenstock said. "We're always looking for financial assistance to continue that R&D work." For example, research funds from state recycling grants a few years ago allowed the firm to experiment in developing a brick product from the glass in old CRT monitors.

Nationwide, we face a challenge educating people about these kinds of used electronics, Birkenstock says.

"Consumers want to know what they can do to recycle e-wastes. We encourage those running recycling programs to publish lists of locations where people can bring used electronics instead of discarding them. For instance in Tennessee, our firm runs the collection program for household electronics. We accept computers, printers, monitors, fax machines, microwaves, AV equipment and TV sets as well as cell phones (once the batteries are separated). We protect your privacy and wipe all hard drives and memory equipment clean. We can be reached at 1-877-NO E-WAST to learn about nearest drop-off locations and any fees."

Find new uses for recycled materials near home

At its largest plant and corporate headquarters in Kohler, Wisconsin, Kohler Company manufactures cast iron, brass and vitreous plumbing products as well as small gasoline engines. The firm employs about 8,000 in Kohler and 28,000

KOHLER COMPANY

Pottery cull is just one by-product that is ground, stored and recovered by Kohler Company in Kohler, Wisconsin. "Our goal in developing new materials from by-products is they can't harm the environment, they must perform at least as well as alternative products and they must be marketable," explains Nathan Nissen, waste management supervisor.

worldwide.

"We recycle manufacturing by-products such as ferrous foundry sand, foundry slag, vitreous plumbing scrap (pottery cull), ferrous and nonferrous metals," explains Nathan Nissen, waste management supervisor for Kohler Company. "We also have extensive recycling programs for paper, cardboard and other materials. We continue to look for ways to expand our recycling programs and to reduce our environmental footprint."

In business since 1873, Kohler Company has been making products from recycled materials since its inception.

"One of our first products was a cauldron made from recycled iron that was first used as a pig scalder," Nissen says. "We added an enamel coating and made the world's first enameled cast iron bathtub, a product we still manufacture today. Styles have changed over the years, but its core ingredients have not."

In the early 1990s the company assigned a business start-up expert to develop ways to recycle factory by-products. Research is threefold — environmental, technical and financial. The goals for new materials developed from research are: they cannot harm the environment, they must perform as well or better than alternative product, and there must be a market for the materials.

In 1995, the company was awarded a state grant to research the use of foundry sand to make controlled low-strength material known as flowable fill. In partnership with the University of Wisconsin-Milwaukee, flowable fill made with foundry sand was used in two overpasses for bridge abutments and performed well.

Nissen says that in finding beneficial reuses for materials, "We have found we need to have a large stockpile of materials. We are marketing to large construction projects such as highways and commercial developments. These customers need large volumes in a very short time. In our most recent project we delivered eight months of stockpiled material in only four days.

"The Wisconsin Department of Natural Resources has complimented us on our storage pad because it is suitable for use in all weather conditions, handles rainwater runoff, and is very well organized," Nissen says. "We segregate five materials in the storage pad, four of which require crushing before they can be used." About every six weeks a bulldozer crushes these piles and pushes them into separate stockpiles that are held until a suitable project is identified. Then we can quickly deliver to the customer."

To expand Kohler Co.'s recycling efforts, Nissen would like to see improvement in Wisconsin's regulatory framework. He notes that some industrial by-products can be used for many construction projects instead of sand and gravel.

"From an environmental perspective, our materials are comparable to virgin materials and in many cases, are cleaner than dirt," Nissen says. "Right now it's only economical to consider projects within 30 miles of our stockpile. We continue to research how we can best use recycled materials as raw materials."

Take a long-term view about recyclables

"My folks, Irvin and Nancy Vincent, founded N.E.W. Plastics Corp. back in 1968 to blow mold milk jugs and other HDPE (high density polyethylene) plastic containers for the food and chemical business," says Lynie Vincent, company vice president. "Now, that part of our business also makes containers for nutritional supplements and medical supplies.

"By 1973, Minnesota was already considering banning plastics from landfills, and my father had a vision that old containers could be ground up and reused for something else; his idea was making plastic lumber for pallets and skids. Back then, others in the plastics industry thought that was crazy. The conventional wisdom was that plastics could not be recycled. But by August 1973 when I was six, I remember our family trip driving down from our plant

in Luxemburg, Wis. to Houston, Tex. where my dad dropped off the first plastic 2 x 4 to one of the executives of the Gulf Oil Company (now Chevron). The rest is history.

"Our recycled plastic division, called RENEW, produces plastic lumber under the name Evolve that is up to 96 percent recycled HDPE. We offer this product in a wide range of colors, dimensions, shapes and textures for customers in marine, agricultural, industrial and residential markets."

Plastic lumber makes excellent decking, fencing, railings and outdoor furniture. The product is colored throughout and it is UV-resistant so the colors won't fade. Since it is only made from pure recycled HDPE (gallon milk jugs and water bottles), it can be recycled over and over again and made into something else.

"I think that composites and solid plastic lumber can be a viable alternative in products and locations where wood might rot," Vincent says.

"Raw materials for our recycled plastics come from companies that specialize in recovering used plastics. The material has already been granulated, flaked, washed and dried for our use. Washing is important to make sure that dried residues are removed so we don't have to worry about contaminants coming off when the plastics are heated to more than 390° and extruded.

"Many people know it is wise to recycle, but they don't often see that their soda bottles are spun into insulation or carpeting. They haven't seen for themselves how we can remake milk jugs into lumber. People would benefit from better training in preparing materials for recycling too. For instance, some don't realize that the caps should be removed from milk jugs, that containers ought to be rinsed to remove residues, and containers used to collect used motor oil should not be placed in the recycling bag because the oil contaminates other plastics.

"Second, we have to get past the mindset that products made from recycled materials are cheaply made and ought to be less expensive. Some are, but others, like our plastic lumber, are made to be extremely durable and UV-stabilized so it won't fade. There are costs in doing business," Vincent explains. "We have costs to collect milk jugs, get them to a recycling facility, grind them, wash them, form pellets and then get them to us for processing. Then we take plastics from different sources and make them into a product with excellent bonding and strength properties. We add colorants that are UV-stable so they won't weather and change. We also can emboss the product so it can have a nice-looking wood grain texture.

One product of N.E.W. Plastic Corp.'s RENEW Division is a durable plastic liner for the inside edge of semitrailers that keeps goods from scuffing and scratching against the side. The company also produces plastic lumber from recycled milk jugs for decking and a variety of other products.

ROBERT QUEEN

ROBERT QUEEN

"Also, you need to look at long-term costs for materials. Quality plastic lumber may cost as much or a little more than wood lumber, but the wood will need more maintenance. For instance, if you buy cedar for a deck project, three years from now it may have weathered to a different color. Now you have to go buy a few gallons of deck wash, a few gallons of stain and, perhaps, a few gallons of sealant. You've just added several gallons of chemicals to the environment, waste containers, and your labor is worth something too. And using the plastic lumber reuses resources. A 20 x 20-foot deck would use the equivalent of 8,400 one-gallon plastic milk jugs that won't end up in a landfill. Choosing quality goods made from recycled products can end up costing a lot less over time.

"Education about conserving resources remains a key. I still think that people today have a lot to learn from people in their 80s who learned to conserve resources during World War II

JAMIE STILLING PTS LANDSCAPING

Much of the scrap from home construction can be collected and reused to drastically reduce waste in new subdivisions. Wood waste is ground and stored on-site for mulch. Drywall is ground into powdered gypsum for a soil amendment. Masonry is pulverized to form a rock base under driveways. PTS Landscaping prepares materials on site and collects, sorts and recycles other materials as a service for the site developer.

when so many materials were collected and rationed. Those people kept lifelong habits about not being wasteful that served them well for decades after the war effort ended," Vincent says. "That's a mindset that would serve us well today and tomorrow."

Recycle onsite where wastes are made

"We started business as PTS Landscaping and operate as Prairie Tree Landscape Center in Elkhorn," says Jamie Stilling, company president. "We are a family-owned landscaping business completing everything from small residential landscape projects to large commercial landscape projects." Prairie Tree started with Bielinski Homes, a developer here in southeastern Wisconsin, installing street tree plantings, berm plantings and temporary seeding throughout their subdivisions. Within two years, Bielinski and Prairie Tree developed a working partnership.

Bielinski knew that many of its customers wanted to preserve the way the land looked before it was developed. As an outgrowth, customers wanted to make the best use of construction materials. A team including Bielinski Homes, WasteCap Wisconsin and Prairie Tree researched ways to recycle throughout Bielinski subdivisions.

"WasteCap Wisconsin recommended contacting a Georgia company, Packer Industries, which had machinery that ground recyclable materials," Stilling says. "Packer Industries was well known for its programs in the south to help cut waste and recycle those materials onsite throughout subdivision development. PTS purchased similar grinding equipment and developed our own approach for construction site recycling. Now we have a system for each phase of the development.

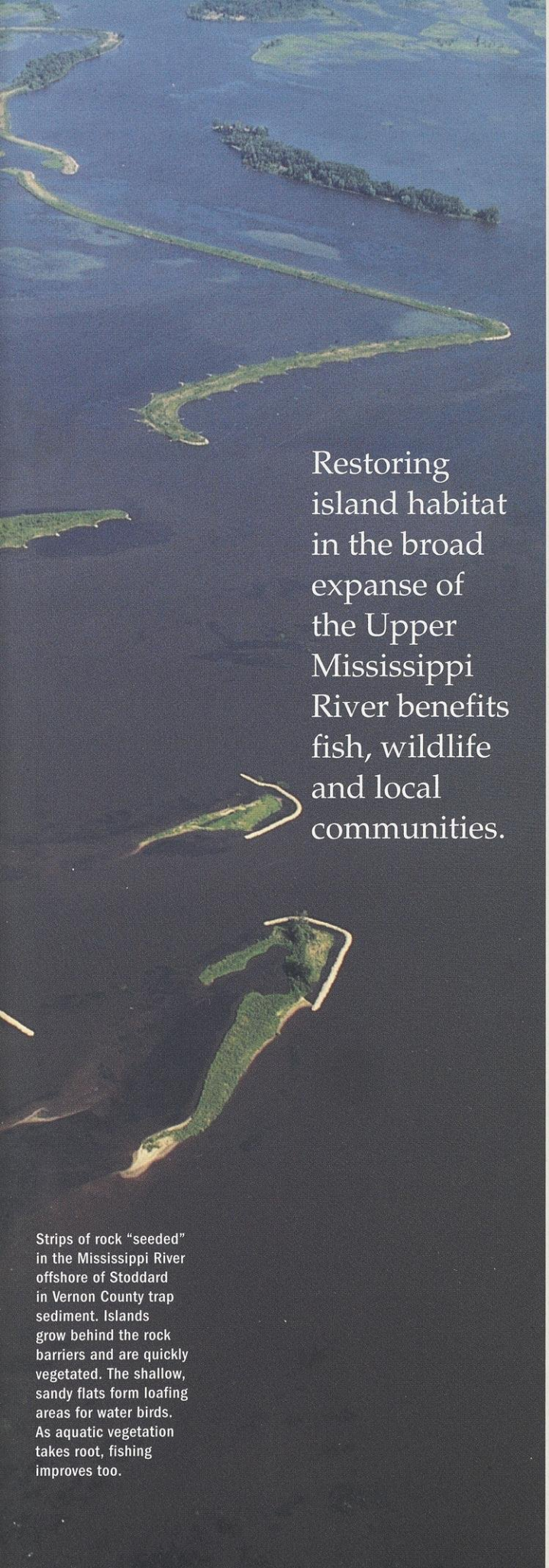
"We are helping develop Best Management Practices for recycling wood and drywall. First, we set up collection areas within the subdivisions where scrap concrete, drywall, lumber, steel, cardboard and other materials can be stockpiled. Two of our crews travel throughout the different subdivisions collecting, grinding and moving usable materials.

"Lumber and drywall are ground and stockpiled for use in the landscape package for each house. Wood grindings can be used in mulch beds and for erosion control instead of silt fence or added throughout the yard to enhance soil conditions. Drywall is ground to gypsum and mixed in with the compost then placed on yards after rough grading is complete. Cardboard is taken to a specific container, picked up and recycled. Concrete is ground and used under driveways. Steel is taken back to Prairie Tree and taken to a recycling company. We are also working with the Department of Natural Resources to determine if vinyl siding can be ground and recycled.

"Currently, Prairie Tree provides recycling for 7-15 subdivisions. Next year the firm hopes to build new partnerships and pursue business from other homebuilders with similar interests. We also hope to expand to commercial site recycling. The aim is to educate people to start this collection process as the initial project specifications are drawn up. This will force all contractors to follow specific guidelines when bidding, recycling and using recycling materials through the landscaping on projects.

"I think in 10-15 years, construction businesses nationwide will see they can make these recycling systems work. Partnerships among developers, landscapers and waste management companies will show they can all benefit from this as well as the homeowners. We also need to see the same standards adopted in neighboring communities. The sooner Best Management Practices for construction sites are in place, the sooner we will have assurances that the guidelines we develop in one community will be acceptable elsewhere. It would save effort if we didn't have to negotiate with each municipality and development to meet the same statewide goals everywhere. I'm hoping we get to the point where this kind of construction site recycling has to be done and becomes routine," Stilling says.

Natasha Kassulke is associate editor and David L. Sperling edits Wisconsin Natural Resources *magazine.*



Restoring island habitat in the broad expanse of the Upper Mississippi River benefits fish, wildlife and local communities.

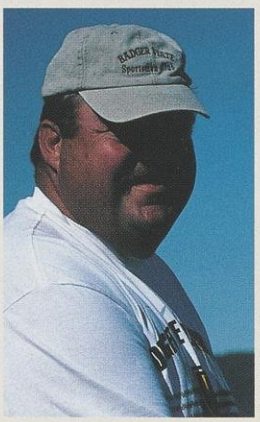
Strips of rock "seeded" in the Mississippi River offshore of Stoddard in Vernon County trap sediment. Islands grow behind the rock barriers and are quickly vegetated. The shallow, sandy flats form loafing areas for water birds. As aquatic vegetation takes root, fishing improves too.

JEFF JANVRIN

Miles of isles

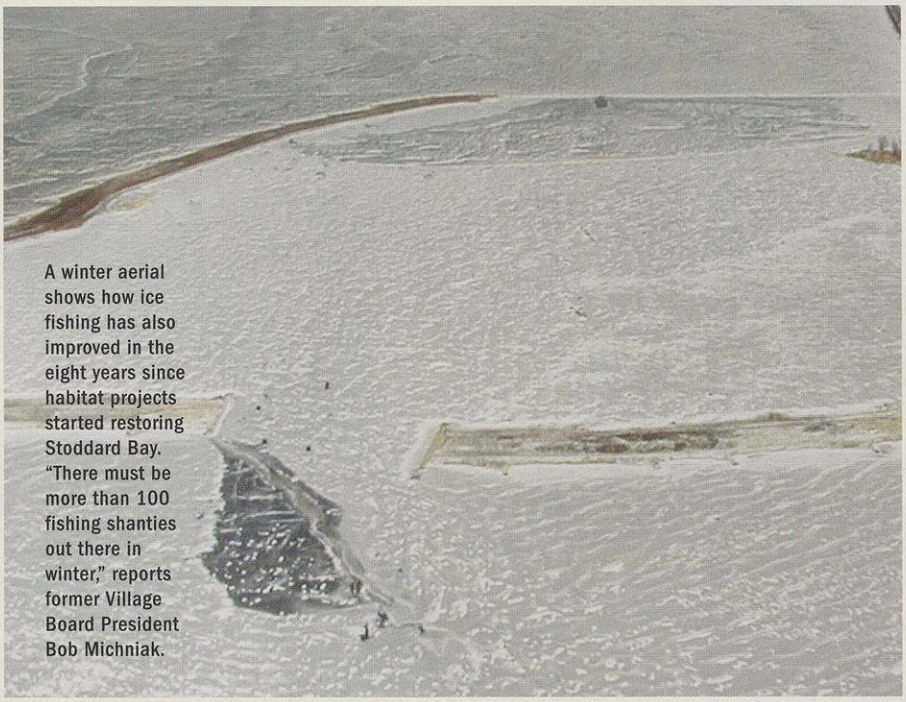
Ruth Nissen

No man is an island, but every island could use a guy like Bob Michniak, retired board president of Stoddard. Michniak can't say enough good things about the islands constructed in the Mississippi River near Stoddard by the U.S. Army Corps of Engineers in 1999. "The new islands brought back the weeds (aquatic plants) which had nearly disappeared, and fish and weeds go together like bread and butter," says Michniak. Today the area is considered one of the best fisheries in the area. Good catches of perch, crappies and "slab" bluegills in the 9- to 10-inch range can be had summer or winter. "It is a fish factory out there!" says Michniak.



RUTH NISSEN

Bob Michniak



A winter aerial shows how ice fishing has also improved in the eight years since habitat projects started restoring Stoddard Bay. "There must be more than 100 fishing shanties out there in winter," reports former Village Board President Bob Michniak.

DNR PHOTO

Just eight years ago Stoddard Bay was a wide open expanse of water. Wave and ice action had eroded the islands that once dotted the bay; as the islands disappeared, so did the habitat. "Back then the fishing was something people only reminisced about," says Michniak. There's no need for wistful recollections now. Ongoing habitat projects funded through the federal Environmental Management Program (EMP) and administered through the U.S. Army Corps of Engineers have helped restore or improve more than 66,600 acres of waterfowl, fish and wildlife habitat on the Upper Mississippi River. The change has brought many more visitors to Stoddard in every season. "There have to be more than 100 ice fishing shanties out on the bay in winter and cars line up on both sides of the road down to the public boat landing," says Michniak.

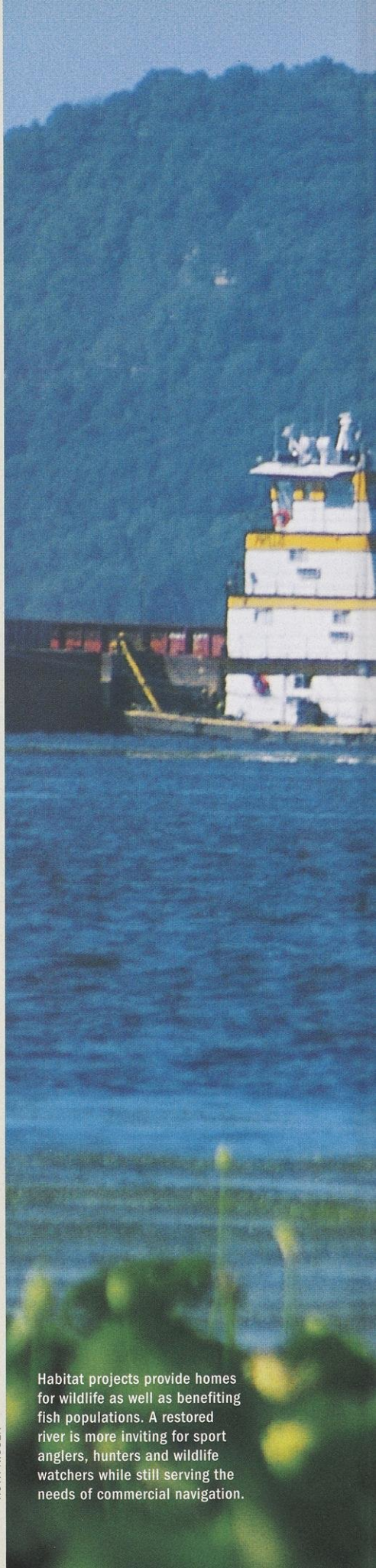
The watershed drainage area along the multistate Upper Mississippi River Basin.

EMP was authorized by Congress in 1986 during a time when the Upper Mississippi River ecosystem was in a state of decline. Levee building, increasing amounts of sediment flowing into the river from agriculture and urbanization, and the construction of 29 locks and dams to tame the river for commercial navigation from St. Paul to St. Louis had smothered the river's island habitats.

Old Man River transformed

Prior to 1866 the Upper Mississippi River along Wisconsin was mainly a wild river whose hundreds of islands diverted the current into countless, ever-shifting side channels and backwaters. In spring the river flowed fast and furious, re-scouring channels and forming sandbars in unexpected places, yet in summer it was shallow enough to walk across. This natural river was too dangerous and unreliable for steamboat traffic, so in 1866 a four-foot channel project began. It was the first of several major alterations the river would endure.

When the system of locks and dams was completed in the 1930s the free-flowing river had been transformed into a series of navigation "pools"



Habitat projects provide homes for wildlife as well as benefiting fish populations. A restored river is more inviting for sport anglers, hunters and wildlife watchers while still serving the needs of commercial navigation.

RUTH NISSEN

STODDARD ISLANDS RESTORATION

Aerial photos over the Stoddard area show that islands and habitat were still visible at least 30 years after locks and dams formed Pool 8. Slowly waves and river currents eroded the islands and sediment filled in to form a shallow pool. Restoration work in the last 15-20 years has brought back island habitat that has helped bring back birds, fish and anglers.

which inundated vast amounts of river valley, creating extensive backwater lakes, marshy meadows and deep sloughs. Much of this flooded terrain became part of the Upper Mississippi River National Wildlife and Fish Refuge, currently stretching from Wabasha, Minn. to Rock Island, Ill.

At first the pools provided abundant food and shelter for fish and wildlife, but over time the habitat quality deteriorated. The dams maintained high and relatively stable water levels in the lower portion of the pools, which made the remaining islands vulnerable to erosion from waves and river currents. Many of the islands eroded away, and the sand and silt carried by the river gradually filled in the channels, deep holes and backwaters. Wind and waves stirred the bottom, muddying the water and blocking sunlight vital to the aquatic plants, insects and other invertebrates at the base of the Mississippi's food chain, eventually leading to the decline of fish and wildlife populations.

Plunging into Pool 8

The double-pronged Environmental Management Program provided federal funding, a new approach and new tools to improve river habitat. The EMP's Long Term Resource Monitoring Program tracked the river's health, and the Habitat Rehabilitation and Enhancement Projects restored habitat along 1,200 commercially navigable miles of the Upper Mississippi and Illinois rivers and lower sections of several major tributaries.

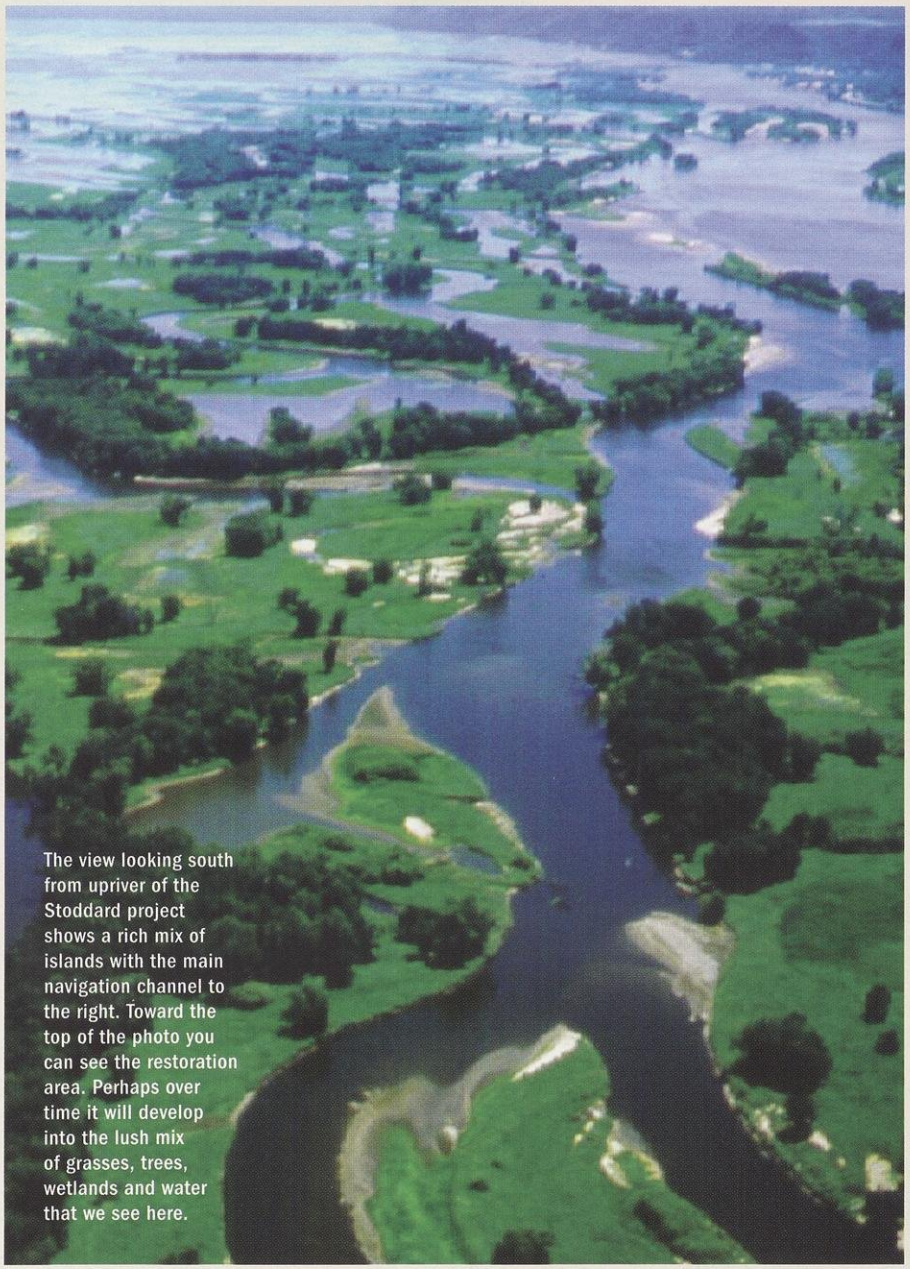
The U.S. Geological Survey (USGS) in partnership with the Corps of Engineers and the states of Illinois, Iowa, Minnesota, Missouri and Wisconsin conducts the Long Term Resource Monitoring Program at six field stations, collecting data on water quality, vegetation and fish. The results help researchers forecast future conditions and provide early warning of potential problems. Additional information is provided by researchers delving into specific questions about the river's ecology. Together, research and monitoring document habitat changes over time and aid in the development and evaluation of management alternatives.

The Habitat Rehabilitation and Enhancement Projects benefit fish and wildlife by restoring lost habitat or protecting existing habitat. In the past 18 years 46 habitat projects have been completed, while dozens of other projects are in various stages of planning, design and construction.

Teams of biologists, managers and engineers from the Corps of Engineers, the five Upper Mississippi River states, and the U.S. Fish and Wildlife Service join with private citizens and organizations to select, design and carry out the habitat improvements. Projects include island building, backwater dredging, stabilizing island and riverbank shorelines, and building control structures to regulate flow and manage water levels.

"The Pool 8 Islands project at Stoddard provides a wealth of fish and wildlife habitat using low islands that will not erode away in a flood," says Jon Hendrickson, a hydraulic engineer with the U.S. Army Corps of Engineers. The Pool 8 project pioneered the use of "seeding" by placing a strip of rock to trap sediment and "grow" islands. The shallow sand flats created by seeding are used by large numbers of pelicans, shorebirds, and waterfowl.

Rip-rapped stabilized banks are so common on the Mississippi River that they almost seem natural, but the new projects go beyond merely lining the shore with rock. "Current bank stabilization design includes a more aesthetic combination of rock and live plants, usually willows," says Hendrickson. "This technique has been used on over 30 miles of shoreline through the EMP program."



The view looking south from upriver of the Stoddard project shows a rich mix of islands with the main navigation channel to the right. Toward the top of the photo you can see the restoration area. Perhaps over time it will develop into the lush mix of grasses, trees, wetlands and water that we see here.

© ROBERT J. HURT

The Stoddard project and its companion project, Pool 8 Islands Phase I, received two major awards for engineering: the Seven Wonders of Engineering for 2002 and the Environmental Award of Excellence from the Chief of Engineers in 2004. Phase III will benefit nearly 3,000 acres located in lower Pool 8 just across the river from Stoddard by reconstructing an island complex similar to what existed in 1954, forming an area protected from wave action and currents to promote aquatic plant beds.

"The project will include islands of differing elevations and widths that will benefit a variety of birds, animals, fish and mussels," says Jim Nissen, manager of the La Crosse District, Upper Mississippi River National Wildlife and Fish Refuge. "The larger islands will have dynamic shorelines that will be allowed to erode, in addition to sandy tips the river can sculpt into attractive sites for hungry shorebirds and nesting turtles, and loafing areas for puddle ducks, swans, geese and other waterfowl," says Nissen. The three phases of island construction in Pool 8 will restore 5,000 acres of the Mississippi River ecosystem, making it one of Wisconsin's largest ecosystem restoration projects.

"The Pool 8 projects have received national and international attention as examples of what can be done to restore habitat on large rivers," says Jeff Janvrin, Wisconsin DNR Mississippi River habitat specialist. "But many more fine habitat rehabilitation and enhancement projects have taken place or are being planned along the Wisconsin's western boundary." Other EMP projects recently completed include Sunfish Lake in Pool 11 near Dubuque, and Ambro Slough/Gremore Lake in Pool 10 just north of Prairie du Chien. "Fishing has already improved at the Ambro Slough Project, but visible improvements at Sunfish Lake are still a few years away," says Janvrin. Projects under construction in 2005 include Spring Lake Islands at Buffalo City and Mud Lake Pool 11 near Dubuque.

Habitat for the future

The Environmental Management Projects have come a long way since the notion of creating artificial islands began 20 years ago. The restoration projects are part of an effort led by the Corps of Engineers to set a 50-year vision for navigation improvements and ecosystem restoration on the Upper Mississippi. "If this program is authorized and money appropriated, restoration work on the river could more than quadruple," says Gretchen Benjamin, Wisconsin DNR Mississippi River team leader.

EMP has been recommended for full funding by President Bush for the past two years, and last June, for the first time, full funding was also recommended by the House of Representatives for 2006. "The proposed increases say volumes about balancing commerce with the needs of fish and wildlife," says Don Hultman, refuge manager of the Upper Mississippi River National Wildlife and Fish Refuge. "A fully funded EMP will pay huge dividends for wildlife, people and the health of the river."

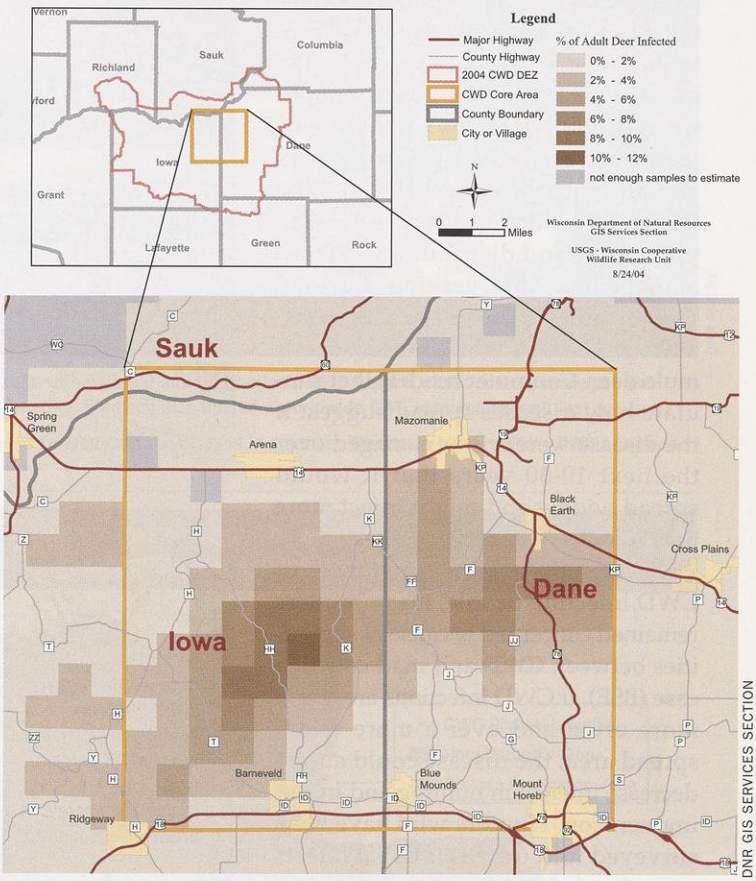
Ruth Nissen works on the DNR's Mississippi River Team based in La Crosse.

As deer are registered following the fall hunt, wear marks on their teeth indicate their age. The sex, age and location of each harvested deer are correlated with chronic wasting disease test results to determine the spread and prevalence of the disease.

3 years down a long road

Robert E. Rolley

2002-03 CWD INFECTION OF ADULT DEER RATES WITHIN THE CWD "CORE" AREA OF IOWA AND DANE COUNTIES, WISCONSIN



Research shows that the CWD outbreak in southwest Wisconsin is tightly clustered. More than 80 percent of the infected deer detected were found in a 126-square-mile area and at the center of the core areas in just a few sections of land 8-12 percent of deer have tested positive.

The discovery of chronic wasting disease in southern Wisconsin back in February 2002 was a significant moment and a serious threat to our state white-tailed deer population and our deer hunting culture. Here, all things deer remain a favored pastime and a big business. Wisconsin's more than 700,000 deer hunters annually harvested an average of 460,000 deer during the last decade. Collectively, the deer hunt provides more than seven million hunter days of outdoor recreation each year and boosts the state economy with more than $500 million in retail sales each year and nearly $1 billion for the state businesses when travel, lodging, food, clothing, equipment and deer processing are added to the economic mix. Whitetails are also important to nonhunters who enjoy seeing deer. In 2001, an estimated 2.2 million residents watched wildlife and nearly 300,000 visitors made trips here to observe wildlife, especially deer.

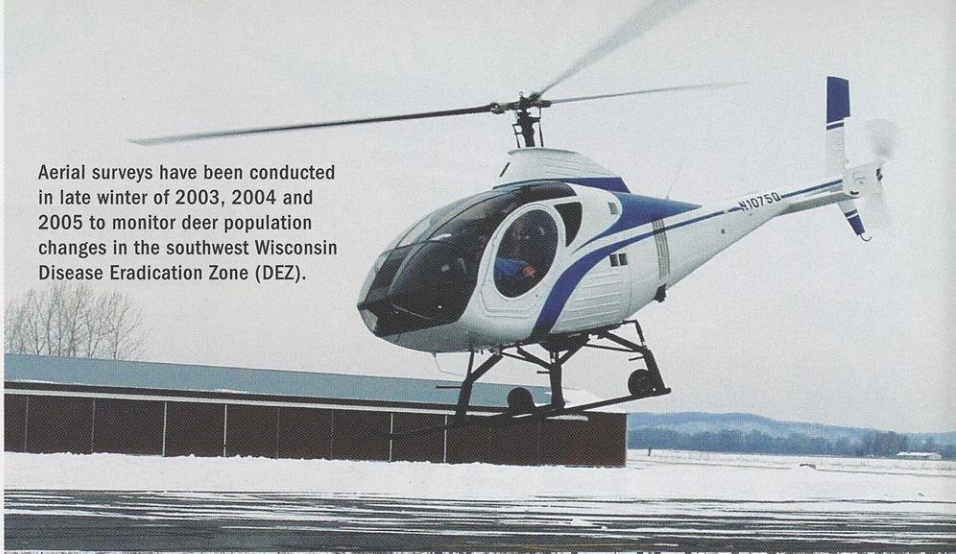
Controlling chronic wasting disease remains a work in progress.

We know now that chronic wasting disease (CWD) is not a wildlife disease that will simply run its course and die. Wildlife disease experts have concluded that CWD will not naturally burn itself out if left alone. The abnormal proteins (prions) we believe cause the disease persist in the environment. Currently there are no proven treatments or vaccines for prion diseases and all infections are believed to be fatal. CWD will most likely increase in prevalence and distribution without management intervention. Further, there is no evidence of genetic resistance to CWD in white-tailed deer or mule deer. Computer models that simulate how diseases spread suggest if the disease were left unmanaged over the next 10-30 years that it would spread widely and might infect more than 40 percent of adult deer.

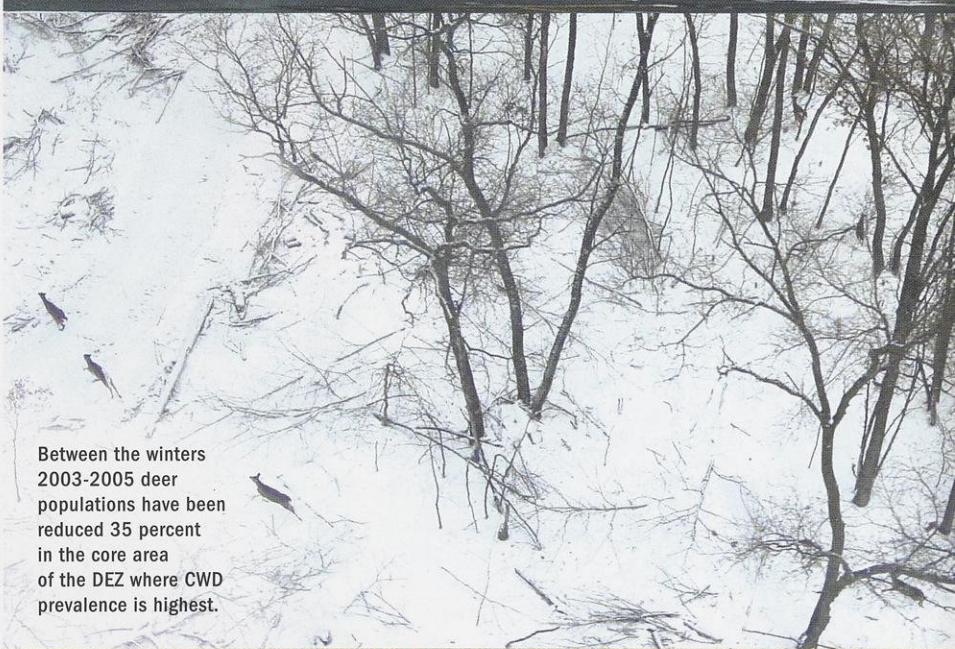
Though there are no instances of CWD infecting people, many hunters remained concerned because of similarities between CWD and mad cow disease (BSE). If CWD infections are found more often and over a more widespread area, the disease could surely decrease interest in hunting and in eating venison. Hunters who have been surveyed told us that if CWD infects more than half the herd, more than half the current hunters would stop hunting. Those numbers would drop even more if scientists ever confirm a link between CWD and human disease.

Wisconsin's CWD management plan

Given so many scientific uncertainties about the basic biology and ecology of CWD, our efforts to manage the disease are experimental by nature. There just aren't established protocols and proven solutions for stopping this disease, but we need to do what we can to contain it and we can't wait for new research before we act. Since CWD behaves in a manner that's similar to other infectious diseases, it's reasonable that some of the techniques used to manage these other chronic diseases may work for combating the spread of CWD. We'll keep trying new strategies that look promising, but we'll also keep evaluating the effec-



Aerial surveys have been conducted in late winter of 2003, 2004 and 2005 to monitor deer population changes in the southwest Wisconsin Disease Eradication Zone (DEZ).



Between the winters 2003-2005 deer populations have been reduced 35 percent in the core area of the DEZ where CWD prevalence is highest.

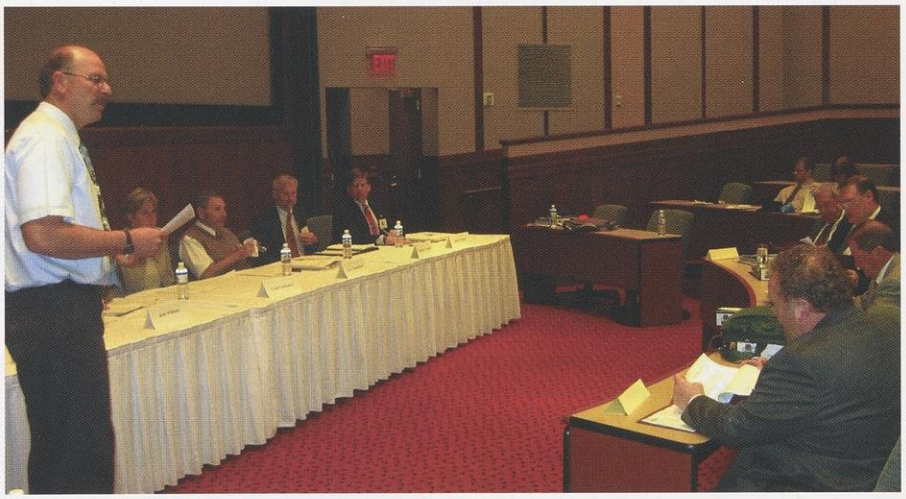
Radio-collaring deer and tracking their movements is an important tool in monitoring deer social behavior and dispersal. Currently 34 CWD research studies are underway in Wisconsin and we are collaborating with 12 studies in other states to learn how the disease is transmitted and survives in the environment.

tiveness of controls by a very practical test — is the disease infecting more animals or fewer animals, and can we slow its spread into new geographic areas? That's why intensive surveillance for the disease remains an important tool.

When chronic wasting disease was verified in Wisconsin whitetails, we quickly realized that we'd need a plan that looked at wild animals, domestic animals and human health, and we'd need research in all of these areas. We developed an interagency partnership among the departments of Natural Resources; Agriculture, Trade, and Consumer Protection; and Health and Family Services; together with the University of Wisconsin; U.S. Department of Agriculture; and the U.S. Geological Survey's National Wildlife Health Center and Cooperative Wildlife Research Unit.

Our aim is to minimize consequences for wild deer and elk, captive herds, hunters, landowners and others whose livelihoods depend on these herds. Our strategy to take steps to eradicate CWD in southern Wisconsin was endorsed as sound and laudable, though ambitious, by an independent panel of wildlife disease experts in April 2003. That stance was reaffirmed this last July at a worldwide CWD summit held in Madison.

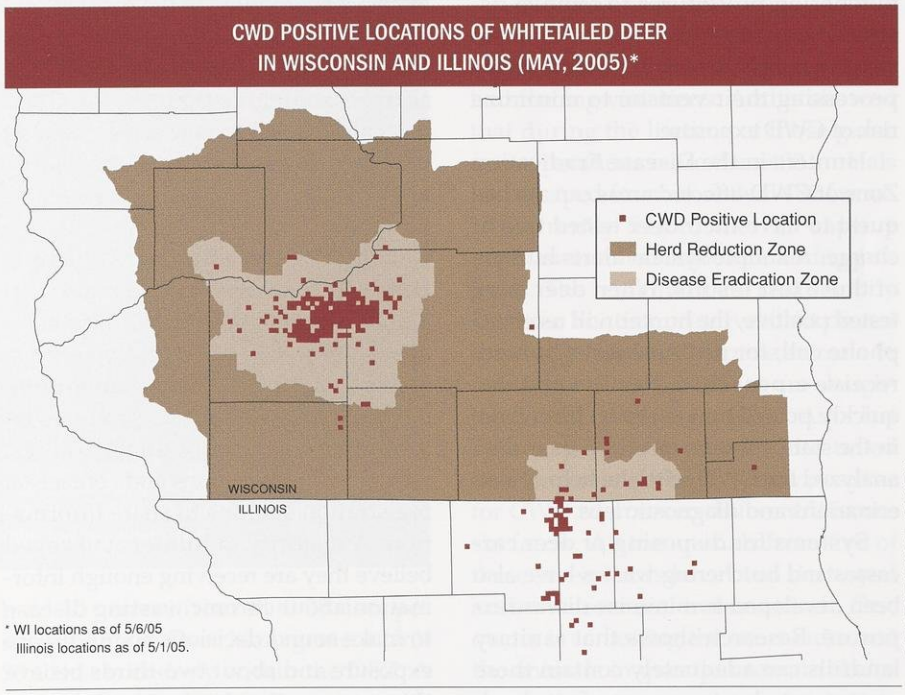
Managing a disease in a free-ranging wild deer herd will remain controversial, difficult and expensive — *controversial* because it depends on reducing the deer herd significantly. We're not sure if it's possible and some landowners in the Eradication Zone remain unconvinced of the need; *difficult* because deer are spread over a wide area, they continue to breed and control efforts may have to continue for decades; *expensive* because the only reliable way to evaluate disease spread is to test large numbers of deer, and tests are both time-consuming and costly.



DNR PHOTO

Wisconsin regularly consults with national and international CWD experts about control strategies we pursue, as in this 2003 meeting. Madison also hosted a worldwide CWD research summit last July.

(below) State strategy aims to eradicate the disease in southern Wisconsin locales where CWD has been detected.



DNR GIS SERVICES SECTION

Results to date

Surveillance for CWD in Wisconsin started in 1999 upon the discovery that infected elk from game farms in the western U.S. had been transported to other states. Through the fall of 2001, about 1,100 deer bagged by state hunters tested negative for the disease. Three positive samples from western Dane County were harvested during the November 2001 hunt and the disease was confirmed in test results reported in February 2002. That warranted more intensive testing in March and April 2002. Some 516 deer were collected within a 12-mile radius of the three positive samples. Fifteen of those deer also tested positive for CWD. More extensive testing has continued since that time. As of last April, 470 wild deer have tested positive for CWD; 445 of those in southwestern Wisconsin, 24 in three counties nearer the Illinois border, and one in eastern Dane County between the two outbreaks. Just south of the border in adjacent areas of Illinois, another 96 deer have tested positive for the disease.

The disease outbreak in southwestern Wisconsin is tightly clustered and not random. More than 80 percent of the infected deer detected were found in a 126-square-mile area bounded by Spring Green, Mazomanie, Black Earth, Mount Horeb and Ridgeway. In that

DNR PHOTO

DNR PHOTO

ANNE OYER

core, 4-5 percent of the deer have tested positive for CWD, at the center of the core in a few sections of land, 8-12 percent tested positive. The infection rate appears higher in bucks than among does and is higher in older animals than in younger ones.

Human health issues

There's no evidence that CWD has ever caused illness in people. As a caution, health experts do not recommend eating known CWD-infected animals, especially those tissues like brain, spinal and lymph nodes where prions are shown to accumulate.

The departments of agriculture and natural resources continue to work closely with meat processors to revise butchering procedures to remove tissues where prions accumulate. Hunters also have easy access to guidelines for processing their venison to minimize risk of CWD exposure.

Hunters in the Disease Eradication Zone of CWD-affected areas can also request to have their deer tested free of charge. A simple system alerts hunters of those test results. When deer have tested positive, the hunter will receive a phone call; for negative tests, hunters receive a post card. Results are also quickly posted on a website. Elsewhere in the state, hunters can have their deer analyzed for CWD with the help of veterinarians and diagnostic labs.

Systems for disposing of deer carcasses and butchering wastes have also been developed to minimize disease exposure. Research shows that sanitary landfills can adequately contain these wastes, yet, due to concerns from landfill operators and municipal waste managers, more stringent disposal options have been taken for the past three years. Awaiting test results, DNR wildlife managers store these deer in refrigerated semi-trailers. Animals that test positive and butchering wastes are incinerated or chemically digested.

Last year another option made better use of animals harvested by hunters who did not choose to keep them for their own use. Over 2,200 deer that tested negative for CWD were processed by Wisconsin meat packers into one-pound packs of ground venison and were donated to food pantries. Through this cautious approach, hunters are now keeping or donating better than 85 percent of the deer harvested.

Research and public discussions

Thirty-four CWD studies are underway in Wisconsin and we're collaborating on another 12 studies nationwide to answer questions about how the disease, deer and people interact in the environment. Others are testing tools for diagnosing the disease and determining any human health consequences from CWD exposure. There are a lot of practical questions to answer about how the disease is transmitted: how prions react in soil; determining which animal species are most susceptible to the disease; and evaluating how hunters, landowners and others react to CWD news. Research on diagnostic tests for CWD have already led to new screening tests that significantly shorten the testing notification time for hunters who harvest deer.

Public outreach to notify people about CWD investigations has also gotten more sophisticated. Wildlife managers use a mix of public meetings, newspaper articles, maps, public opinion polling, personal visits, toll-free information lines, individual mailings, web pages, publications and contacts at registration stations to share information. A majority of hunters surveyed believe they are receiving enough information about chronic wasting disease to make sound decisions about disease exposure and about two-thirds believe the agency provides opportunities to listen to their concerns and opinions about the disease. Moreover, communications among the Department of Natural Resources, other state and federal agencies, researchers, landowners, hunters, municipalities, lawmakers and other residents in areas where CWD is being investigated is critical in taking collaborative actions to control the disease spread.

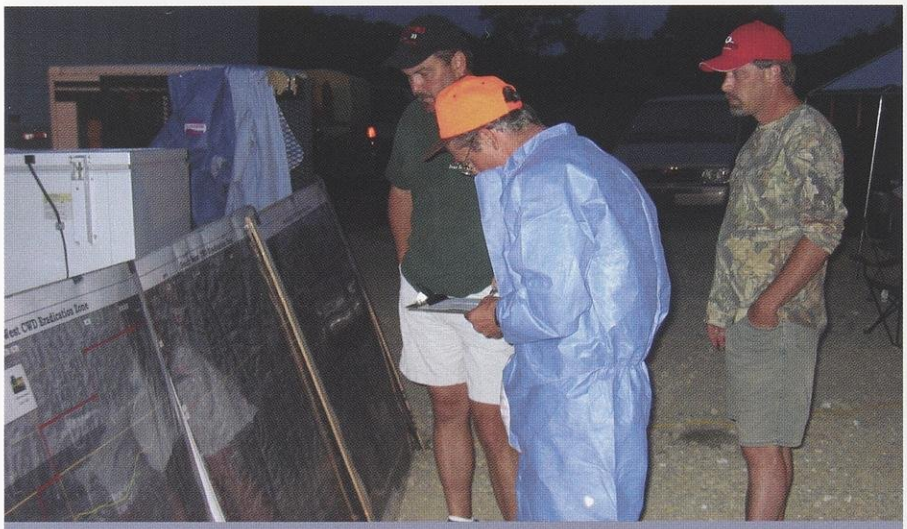
Containing disease spread

Removing as many deer as possible from CWD-infected areas provides our best opportunity to control the disease. Since there are no effective CWD vaccines nor proven treatments for infected animals, a key strategy remains reducing the deer herd size and changing its composition. Increasing the harvest, especially of does, will eventually produce smaller herds of younger animals. That's important because we know that younger animals are less likely to transmit the disease; deer over three years old have the highest infection rates. As the population size drops and fewer deer disperse, disease transmission would also be expected to drop.

We're coupling that with other strategies to reduce disease spread. Within counties where CWD has been identified, sick, injured and "orphaned" deer cannot be rehabilitated. The sale and movement of farm-raised game is carefully monitored. All deer harvested or dying on game farms must be tested for signs of the disease. And butchering wastes and carcasses are carefully managed as previously described. Baiting and deer feeding within CWD areas is prohibited to lessen the likelihood that deer will congregate and potentially spread disease. In areas where CWD has been detected, extended hunting seasons and bag limits will remain much more liberal and additional permits will allow landowners to hunt deer outside of established seasons. Some landowners have allowed government sharpshooters to remove additional animals in late fall and winter months.

A partnership with Whitetails Unlimited in 2003 and 2004 offered rewards to hunters and landowners who harvested deer that subsequently tested positive in CWD affected areas. Hunters and landowners split $400 payments when positive deer were detected and all hunters who registered deer taken in the disease eradication zone (DEZ) were eligible for $20 payments drawn on a lottery basis. An estimated $250,000 was paid out each year under this incentive program.

These combined programs are slowly reducing herd numbers in infected areas as hoped. In 2002-3 more than 9,200 deer were removed from the erad-

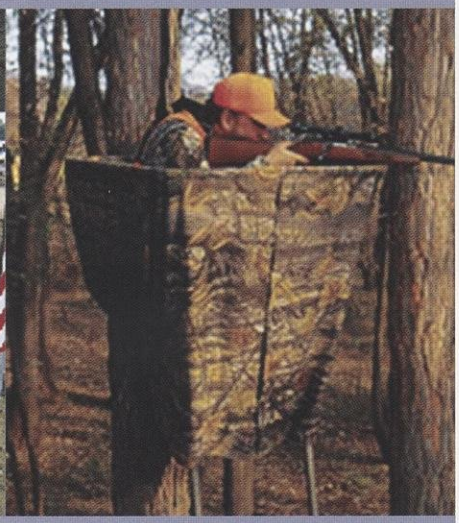


DNR PHOTO

Cooperation with landowners and the hunting public is vital to link where animals were located if harvested deer are found to be infected.

DNR PHOTO

Helping the public judge reasonable risks of CWD exposure is important to keep people of all ages interested in hunting traditions.



DNR PHOTO

Extended hunting seasons and sharpshooters try to further reduce the deer herd in areas where CWD has been detected.

ication zone, nearly 13,700 deer in the 2003-4 season and approximately 16,000 in the 2004-5 season. Between 65-70 percent of these animals were antlerless deer (does and fawns). A survey of hunters in the DEZ following the 2003 season found they hunted an average of four days longer and harvested twice as many deer as hunters outside of the CWD management zones. Still, the goal of reducing the deer densities in CWD affected areas remains daunting. Researchers believe they will need to reduce and sustain the herd levels to about five animals per square mile of deer habitat to control the disease. Winter aerial surveys estimate cumulative efforts since 2001 have reduced the herd 40 percent from 48 to 28 deer per square mile in Deer Management Unit 70A that is entirely within the DEZ. A similar Herd Reduction Zone sets a 40-mile radius ring around the DEZ in southwestern Wisconsin within which managers provide hunting opportunities to reduce deer populations to 10 deer per square mile. Between 73-75 percent of the deer harvested in this zone were antlerless deer in the last three years.

Changes at game farms

Nearly 720 deer and elk farms in Wisconsin contain about 30,500 animals — mainly whitetails and elk with smaller numbers of several other deer species. Since the discovery of CWD these farms have been subject to more recent inspection and more rigid bookkeeping requirements. They've had to beef up their fencing and testing programs. Orphaned and injured deer from the wild can no longer be accepted at game farms. All farms selling live animals must census their animals, mark each with identifying marks and file annual reports detailing where each animal came from or was shipped. Any animal imported into Wisconsin needs a permit from the State Veterinarian, certified inspection, proof that it is free of tuberculosis and brucellosis and documentation that it came from a herd that has had no evidence of CWD for at least five years.

DNR audits of 550 farms in 2002 found the majority complied with existing state laws, though 77 game farms had fencing violations. Audits showed that during the lifetime of those game farm operations more than 400 animals had escaped from more than 182 farms.

Currently 544 of the 720 captive herds are enrolled in the monitoring program. The remainder are small hobby farms or hunting preserves that do not ship live animals. All captive animals 16 months or older that die or are slaughtered must be tested for CWD. As of last February, 29 farm-raised white-tailed deer and one elk have tested positive for CWD from seven different Wisconsin farms. All the animals from five of these seven herds have been destroyed and the owners indemnified. One owner is contesting the court order and the animals in question remain under quarantine.

Be prepared for a long-term commitment

Public support to eliminate or contain the spread of CWD remains strong among hunters and landowners. Support for the particular strategies the Department of Natural Resources is pursuing is not as strong, but most give the DNR good grades for the efforts to date. Commitment from the general public and legislature will be critical to bolster the $20 million (largely from hunting

Inspections and regulations are more rigid now at game farms and hunting preserves where captive deer are raised, moved and hunted. For instance, all farm-raised deer 16 months or older that die or are shot must be tested for signs of CWD.

DNR PHOTO

fees) spent in Wisconsin since 2002 on CWD surveillance, management and eradication efforts. We believe the average $5 million spent annually on CWD management is a sound investment to protect the health of our deer herd, given deer hunting's nearly $1 billion impact on the state's economy and its value as prized recreation.

We can't accurately predict how many years it may take to determine if CWD control programs in Wisconsin are effective in reducing the incidence of disease and the size of the area affected. However, our nation's experiences in controlling other animal diseases are instructive. U.S. programs to eradicate brucellosis in the nation's beef herd began in 1934. The infection level was reduced from 11 percent in the 1930s to five percent in the 1940s to less than one percent in the 1970s. The Australian programs to eradicate bovine tuberculosis and brucellosis required over 20 years. Michigan's program to eradicate bovine tuberculosis from its free-ranging deer herd has been underway for 10 years and may require another 10-20 years as well.

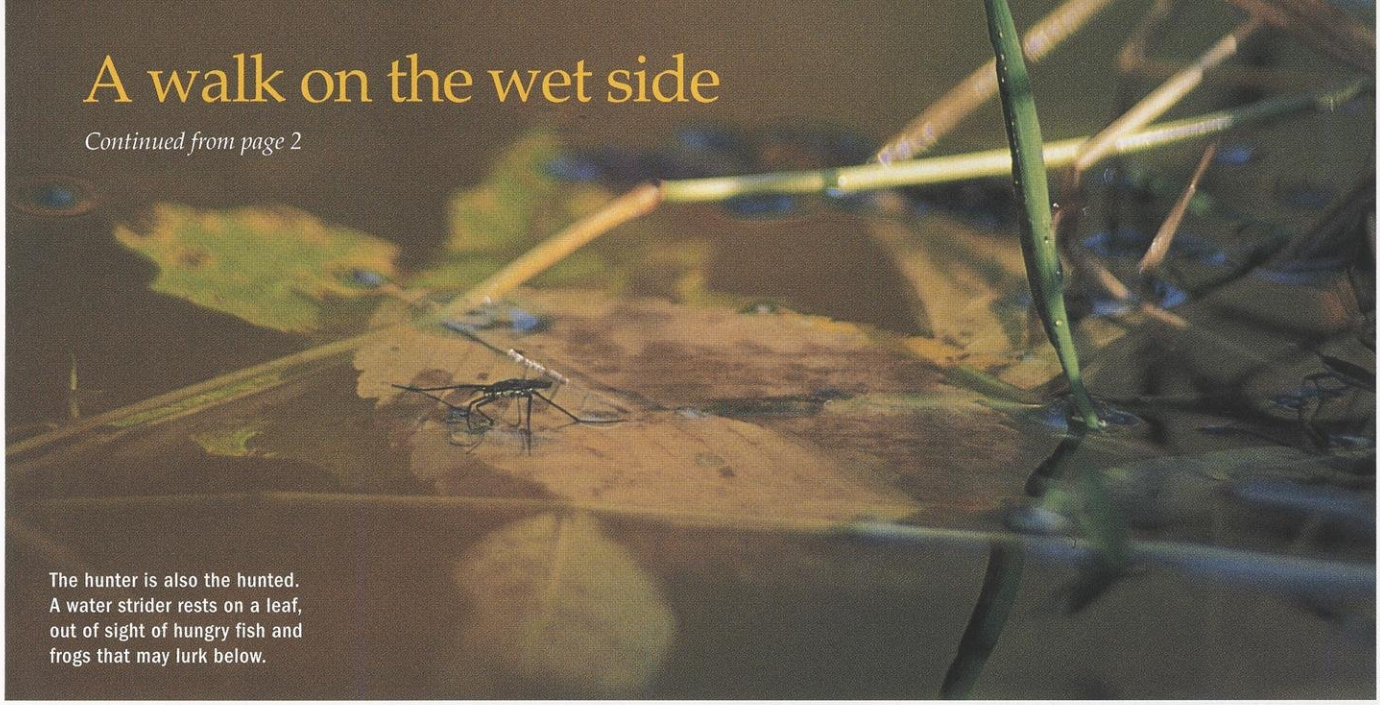
During these first three years of dealing with this disease we've conducted extensive tests to determine the extent of the disease. We've made significant progress reducing free-ranging deer populations where disease has been detected. We've taken further steps to reduce its transmission including banning baiting and feeding of deer in these areas, and tracking and controlling CWD spread on game farms. We've also made significant headway in describing the realistic risks of disease exposure to people, setting up systems to test harvested animals, sharing those results, safely disposing of deer that test positive, and making good use of deer that are not infected.

Given how much we have to learn about this most unusual disease, it's too early to predict whether our management program can eradicate CWD, but that is clearly our aim. Stopping any wildlife disease, especially one that is caused by abnormal proteins, is a difficult challenge. Our management approach is very similar to that which is making headway in Michigan to control bovine tuberculosis. Controlling CWD in one of our most popular and widespread wildlife species will test our resolve, our financial commitment, our staff and volunteer commitment, and our scientific abilities to limit its spread. This effort will also require sustained cooperation and communication among natural resource and agricultural agencies, researchers, volunteers, hunters, landowners and captive deer/elk producers.

Robert E. Rolley is a wildlife researcher with DNR's Bureau of Integrated Science Services. *This article is distilled from his recent publication CE-461,* "Controlling Chronic Wasting Disease in Wisconsin, A Progress Report and Look Toward the Future." *Copies of the full report are also available from Alan Crossley, 3911 Fish Hatchery Rd., Fitchburg, WI 53711 and can be downloaded online at dnr.wi.gov/org/land/wildlife/whealth/issues/CWD/cwd-report.pdf.*

A walk on the wet side

Continued from page 2



The hunter is also the hunted. A water strider rests on a leaf, out of sight of hungry fish and frogs that may lurk below.

DON BLEGEN

When water striders skate into view a natural question is how do they perform the enviable feat of walking on water? First, recall a discussion from Physics 101. Calm, smooth water has a tension on its surface created by weak, asymmetrical, attractive forces between water molecules. Thus, light objects will float on water and heavier objects break the surface tension and slip below.

If you can catch an elusive, quick-darting strider (a challenge in itself), look at its four back legs that are used for locomotion. Use a hand lens to look at the position of the tarsal claws. On "typical" insects, each pair of tiny tarsal claws is located at the tip or apex of the insect's leg. On water striders, the claws are positioned a millimeter or so farther back up the leg — far enough that they do not penetrate the water and break the surface tension when the insect moves. A second adaptation is each leg is covered with many fine, velvety-looking, hydrofuge hairs. These water-repelling hairs prevent the legs from becoming wet. Wet legs would also break surface tension.

Now that we know how water striders stay afloat, notice how they move in two different ways — a slow, graceful glide and skating motion, or a quick spurt and dart. The glide or skate is accomplished when the insect rows with its middle legs while its rear legs trail and steer like a rudder. Water striders skate when facing upstream against a current or when orienting to other objects on the surface like food or other striders. Darting uses both pairs of back legs for propulsion. Quick movements are necessary when pursuing insect prey, eluding danger or when males grab females.

Water striders obtain food by waiting for living or dead insects to drift by or by responding to vibrations produced by struggling insects caught on the surface. Sensory receptors on the tips of their legs pick up the vibrations and help the striders orient and zero-in on potential meals. The striders dart into action, grab their victims with strong, raptorial front legs, pierce the victims' bodies with their beak and inject digestive enzymes. The enzymes dissolve and liquefy the victim's internal organs which are then sucked up. The exoskeleton is discarded.

Striders also mate on the water surface. Depending on the species, males may defend small circular territories while waiting for females to drift by or they may lure females by tapping the water with their legs to create "good vibrations" to which the females respond. Males may just pounce on females. Once the pair gets together, after an initial struggle and rebuke by the female, mating is fairly quick, but the pair can remain together for several hours. After mating, the female lays her eggs on submerged rocks and logs. Nymphs hatch in about two weeks and swim to the surface where they must break the surface tension and climb on top of the water. Over the next few weeks, nymphs molt five times before becoming adults. Wisconsin species may produce one or two generations of striders per year. Water striders overwinter as adults under stones at the pond bottom and emerge the following spring when mating commences.

Water striders spend most of their short lives on the water, but life is not endless days of calm water and sunshine. Danger is ever-present. If a wave breaks the surface tension or wets the striders' legs, the fragile insects may slip or be dragged underwater and drown. To survive this misfortune, the insects must crawl onto shore, a rock or vegetation to dry their legs before venturing back onto the water. Meanwhile, insect-eating birds flit overhead while hungry fish and frogs lurk below. Back swimmers, other predaceous aquatic insects, respond to movement on the surface and prey on water striders, especially mating pairs. To fend off these dangers, water striders often rest on floating vegetation to reduce their visibility and vulnerability.

Water striders are really cool insects to study. I was surprised to discover that the shiny, silver racing stripes on the sides of one large species are not colored markings, but rather are composed of fine, silver, hydrofuge hairs that glisten in the sunshine. So wade right in and take a closer look at one of the only insects capable of walking on water.

Anita Carpenter wades in to take a closer look at Wisconsin wildlife near her Oshkosh home.

READERS *write*

COMMENT ON A STORY?

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

STUNNING PHOTOS

Please give my congratulations to Dave Crehore on his photography skills ("Show more with less," June 2005). The pictures are stunning.

Katherine Esposito
Madison

For those who want to see the complete set of photos that accompanied Mr. Crehore's story, visit our website, www.wnrmag.com. The story tag is: stories/2005/jun05/photos.htm

INCORRECT WEBSITE

On the back of the June 2005 issue I saw a beautiful place ("Wisconsin, naturally - Milwaukee River and Swamp State Natural Area). I have tried the URL listed and been told it doesn't exist.

Arthur J. Sprader
Wauwatosa

Thanks for pointing out the incorrect listing for that State Natural Area, located within the Northern Unit of the Kettle Moraine State Forest. The correct listing is dnr.wi.gov/org/land/er/sna/sna93.htm.

NATIVE GARDENING

I was just enjoying my August 2005 issue and the article about the roadside cup plants ("Let the cup be unbroken"). My husband is creating some new beds around our suburban yard and we are ever watchful for native plants which would attract birds and butterflies. Can you advise us as to where we could find these plants for purchase? Also, do you know anything about them? Are they good plants for suburban gardens?

Carole McGibany
Menomonee Falls

Carole, we suspect that local nurseries that handle perennial plants can help you find cup plant. Another good source of information is The Wild Ones, a nationwide organization that advocates natural landscaping. For a listing of Wisconsin chapters, go to www.for-wild.org/chapters.html#Wisconsin. The Department of Natural Resources also maintains a listing of nurseries that carry native plants species at www.dnr.state.wi.us/org/land/er/invasive/info/nurseries.htm.

KUDOS FOR REDHEADS

Just a note to thank the Wisconsin Department of Natural Resources for publishing this beautiful and informative magazine. I just got through reading the August 2005 issue and had to let you know how much I enjoyed all the articles. There's always something that gives you more knowledge on a subject or just takes you away to somewhere special in Wisconsin. I especially enjoyed the article on the red-headed woodpecker's return ("The return of the loud redheads"). Hope a lot of landowners can help in restoring snag habitat so these beautiful birds will become more abundant. Keep up the good work of reporting about the great outdoors in Wisconsin, this wonderful state we call home.

Al Huschka
Richland Center

The article on the red-headed woodpeckers looks great. Rich King and I are very hopeful that it will influence some private landowners and public property managers to manage for this species.

Would you correct one small error for readers? In the caption to my map on page 17, the publication described these routes as "mean counts on 55 Wisconsin bird banding routes." These were actually breeding bird survey routes [conducted as part of the state and nationwide project to map and track birds' breeding territories over time].

William P. Mueller
Issues Committee Chair, Wisconsin Bird Conservation Initiative
Conservation Chair, Wisconsin Society for Ornithology
Milwaukee

TWO-WHEELING TOUR

Thanks for the great story on elegant ecotourism on two wheels in the August 2005 issue ("Tour de Fitchburg") — no riders left behind. This article brought the event to life and will be very much appreciated by the communities involved. The writing was excellent and it is a very fine piece. Thank you!

Karl Gutknecht
Cycle Ventures International
Madison

UPDATE

NEW TECHNOLOGY MEANS MORE WISCONSIN WATER

New tools and high quality data have enabled the state to more accurately account for the number and size of Wisconsin's water bodies. That means there are really 84,500 miles of rivers and streams, where we once thought there were 57,700 miles. The new calculations also show Wisconsin's 15,057 lakes stretch across 1.2 million acres, not the .9 million acres reported a few years ago.

This new electronic water data is available to the public in an easy to use map called the Surface Water Data Viewer, at dnr.wi.gov/org/water/data_viewer.htm. The viewer gives the public and DNR the ability to click and point on a map and reach up-close views of water resources, locations of dams, impaired waters, outstanding and exceptional resource waters and floodplains.

"It's sort of like having a street address on the water for everything we do," says Ann Schachte, Geographical Information System (GIS) specialist. "It's a visual way of displaying all of the information in one place."

New information will be added to the map in the future, including water monitoring data, community growth data, and the location of activities that require DNR permits, such as wastewater discharges.

Q & A

Your TRAVELER'S not complaining (much), but sometimes being the Oracle of the Long and Winding Road takes its toll in more than just small change. The things people want to know! Like, where is Milwaukee? (Go east until you hit Lake Michigan. Jump in, then turn around. You're there.) And questions like the following:

Q. The wife says I got no culture. Is she right?

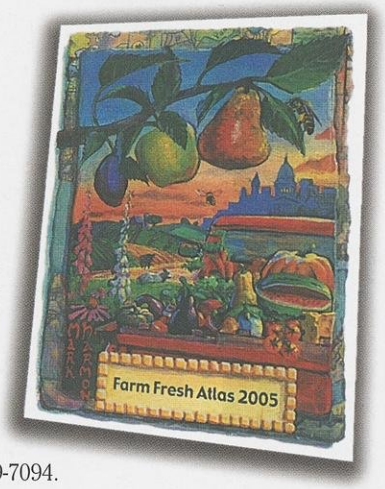
A. Hmmm...she could be on to something. Rectify those subtle deficiencies on the **Fall Art Tour,** October 14-16. Local painters, sculptors, potters, weavers, jewelers and woodworkers demonstrate their skill and display and sell their works in their studios and homes around Spring Green, Dodgeville, Mineral Point and Baraboo. Visit www.fallarttour.com or call (608) 987-3787. If you crave further exposure to artistic expression, take the **Earth, Wood & Fire Artist's Tour** on October 22 & 23. It's a self-guided tour of the studios and showrooms of 12 fine artists and craftspeople in Cambridge, Fort Atkinson, Johnson Creek and Lake Mills. (608) 423-4424.

Q. How can I pass my geometry final?

A. Square the circle in the Octagon at Pinecrest Historical Village in Manitowoc. On Saturday, October 15, Pinecrest hosts a **Traditional Barn Dance** in its octagonal dance hall, complete with a live band playing the tunes and a caller to walk everyone through the intricacies of a Perfect Diamond, a Triangle Grand Square, and Circle to a Line. You'll be best buddies with Euclid before the night is out. 7 p.m. $6 adults, $4 children. See www.mchistsoc.org/ or call (920) 684-4445.

Q. How can I spend Halloween getting down and dirty?

A. Generally TRAVELER does not entertain queries of a salacious nature, but for hedonists with an outdoor bent, exceptions will be made. The Ledge View Nature Center in Chilton gets *way* down to lead **Halloween Candlelight Cave Tours** on October 21 & 22, starting at 6 p.m. All participants are advised to wear old clothes and anticipate getting "a bit dirty" as they descend into Carolyn's Caverns (Please note visitors need to be able to use stairs and ladders to enter the cave). Catch up on local history, learn about the animal denizens of the dark cave — and wipe that dirt off your face before you give someone a real fright. Good clean family fun for children 5 and above. $5 admission includes popcorn and cider. Visit www.dotnet.com/~ledge/caves.html on the web or call (920) 849-7094.

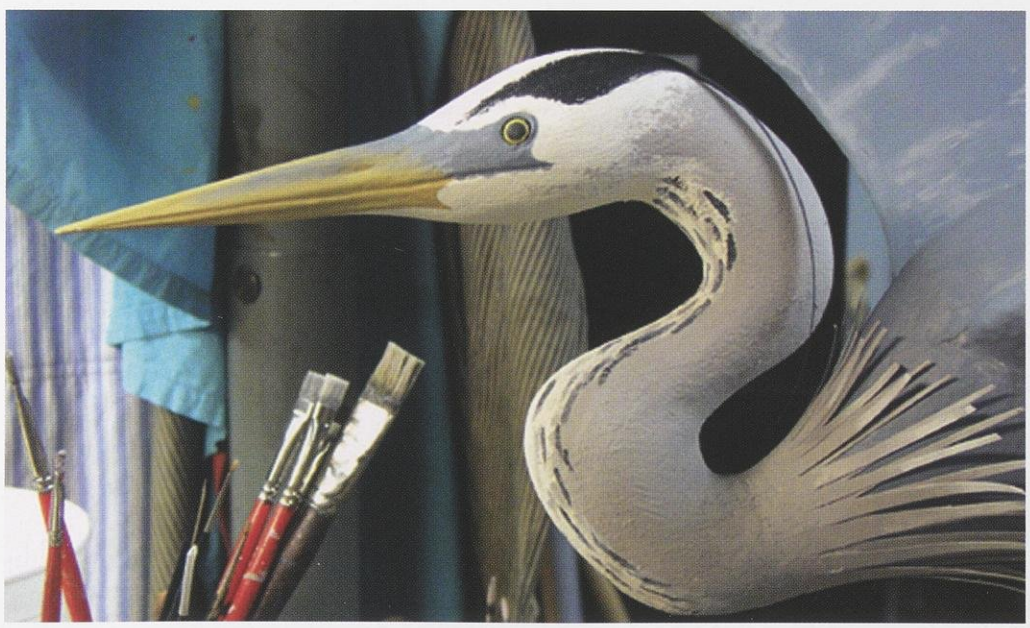


Q. What has more frothy heads than a Paris Hilton look-a-like convention?

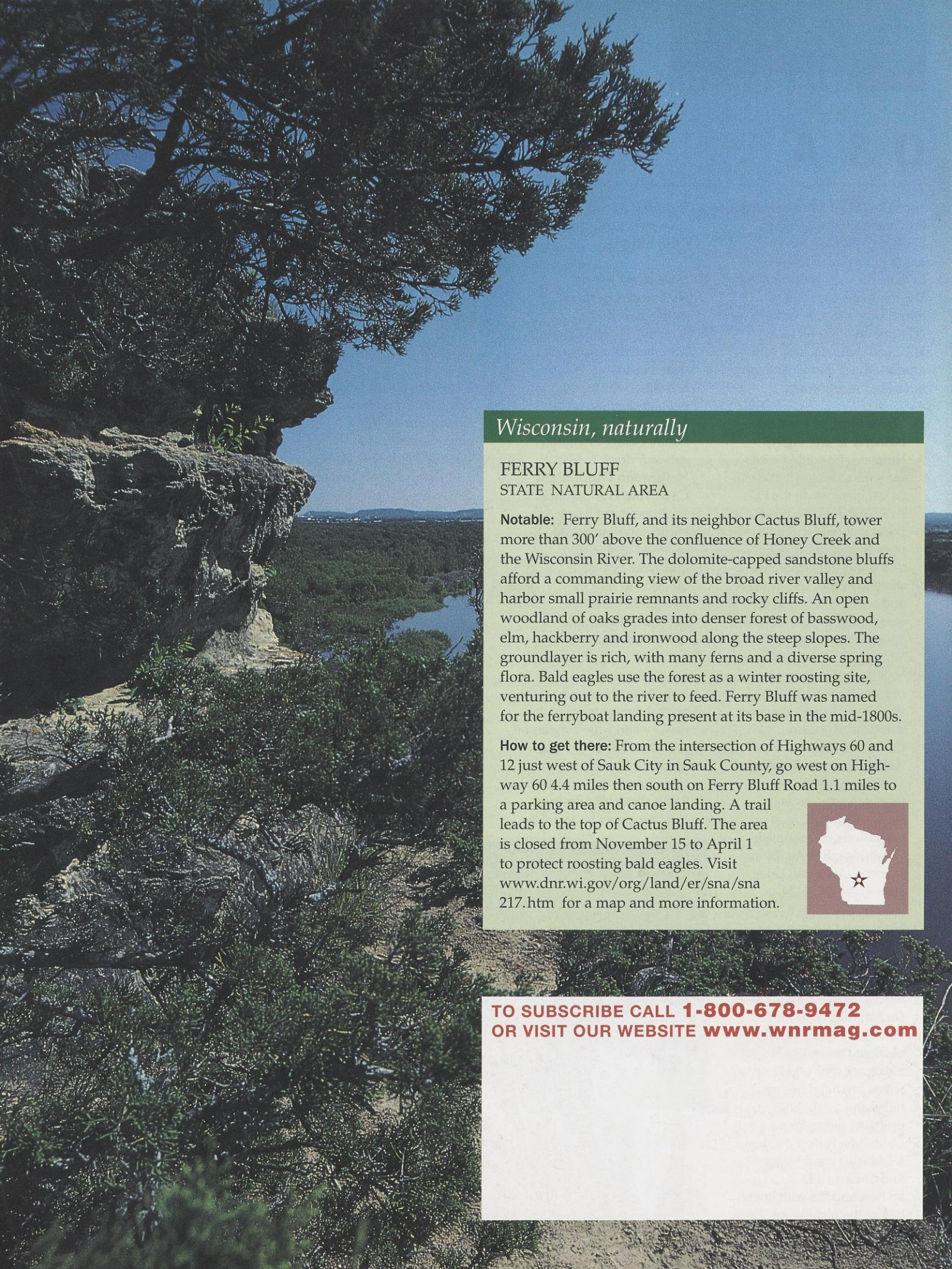
A. The **2005 Fall Fest of Ale**, a celebration and competition to highlight the finest microbrews from Wisconsin and the U.S.A on Saturday, November 5 at Rotary Gardens, Janesville. All fest attendees will be given a complimentary tasting glass from which they can sample nearly 100 different ales, porters, stouts, pilsners, bocks and lagers made with quality ingredients and crafted with care. Brewmeisters will be on hand to extol the virtues of their beverages, which likely will go beyond mere thirst-slaking to include hair restoration, the banishment of rheumatism, and the rescue of Western civilization as we know it. If all the ferment proves overwhelming, there will also be 20 kinds of handcrafted sodas to sip, tasty snacks to munch, and live entertainment. Quaffers pay $30 in advance, $40 at the door. See www.fallfestofale.com or call (608) 345-1035.

Q. Where can I find enough Northern Spies to fill the apple barrel before winter sets in?

A. The **2005 Farm Fresh Atlas** (www.reapfoodgroup.org/atlas/index.htm) has your answer. It's a list of farms and food-related businesses selling direct to customers in southern Wisconsin, and features fresh fruits, vegetables, cheese, honey and much more.



KIM AND ROB RUSSELL, WOOD CARVERS FROM SPRING GREEN, WIS.



Wisconsin, naturally

FERRY BLUFF
STATE NATURAL AREA

Notable: Ferry Bluff, and its neighbor Cactus Bluff, tower more than 300′ above the confluence of Honey Creek and the Wisconsin River. The dolomite-capped sandstone bluffs afford a commanding view of the broad river valley and harbor small prairie remnants and rocky cliffs. An open woodland of oaks grades into denser forest of basswood, elm, hackberry and ironwood along the steep slopes. The groundlayer is rich, with many ferns and a diverse spring flora. Bald eagles use the forest as a winter roosting site, venturing out to the river to feed. Ferry Bluff was named for the ferryboat landing present at its base in the mid-1800s.

How to get there: From the intersection of Highways 60 and 12 just west of Sauk City in Sauk County, go west on Highway 60 4.4 miles then south on Ferry Bluff Road 1.1 miles to a parking area and canoe landing. A trail leads to the top of Cactus Bluff. The area is closed from November 15 to April 1 to protect roosting bald eagles. Visit www.dnr.wi.gov/org/land/er/sna/sna217.htm for a map and more information.