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WISCONSIN

NATURAL RESOURCES

June 2003 \$3.50

The mystery
of missing
perch

Butter, corn
and other
memorable spills

A year with
CWD

A
beachhead
for **safe**
swimming



Snowy owl stats

Size: Snowies are North American owl heavyweights at 3.5–4 pounds and their wingspans are up to five feet. Only the great gray owl is about four inches taller. Female snowy owls are slightly larger and have darker feather patterns.

Plumage: Females and first-year males are white with black barring on the back and underside, tail, wings and top of the head. Adult males have less barring, and some are almost pure white.

Vocalizations: Like most owls that are active during the daytime (diurnal), snowy owls are typically very quiet, except during breeding season. When disturbed, males will call *kre, kre, kre* in flight.

Diet: Snowy owls eat rodents, waterfowl, rabbits, snowshoe hares, songbirds, fish and carrion.

Range: Their breeding territory is circumpolar. Winter range is south through Canada and the northern half of the United States. Snowy owls are rarely found as far south as Texas, Florida and Bermuda.

Eggs: normally 3–5; when food is abundant 7–11

Nest: a bare scrape on the ground

Molt: Adults molt their feathers completely once a year starting in July and ending early October.

Mortality: humans (accidental shootings), collisions (cars, trucks, utility lines and airplanes), electrocution (resting on utility poles), fishing tackle, predation by foxes, wolves, dogs, jaegers (a gull-like seabird), starvation

Migration: Snowies regularly migrate in winter from November through March on the U.S.-Canadian border and south to the Great Plains.

Winter Habitat: seacoast, lakeshores, farmland, urban areas near grain elevators, airports and garbage dumps

Life Span: in the wild, approximately 10 years; in captivity, approximately 28 years

Status: protected by state and federal law

A FAR FLY FROM HOME

Who would have bet on a snowy's chance in summer?

Heide Hughes

A little before noon on the Fourth of July, Alice and John Droske of Elk Mound hopped into their Jeep and headed off in no particular direction. It was sunny, 80 degrees and a great day for a ride with the top off. Just west of Eau Claire, Alice spotted something big and white, sitting on a roadside billboard. It was a snowy owl (*Nyctea scandiaca*), not something they expected to see in the middle of summer.

The Droskes were hesitant to report it to local birders. After all, if the bird didn't stick around, no one would believe them. As they drove through the same neighborhood later in the month and again in August, the conspicuous Arctic bird was hard to miss.

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WISCONSIN NATURAL RESOURCES

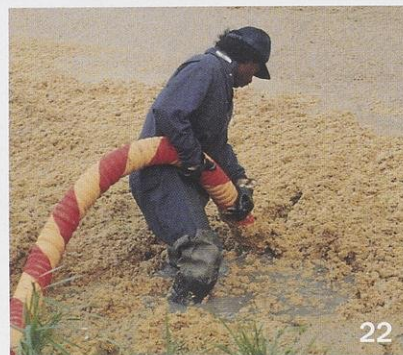
June 2003
Volume 27, Number 3



DNR BUREAU OF WILDLIFE MANAGEMENT



DNR SO. LAKE MICHIGAN FISHERIES TEAM



DNR PHOTO

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RJ & LINDA MILLER, LA CROSSE, WIS.

BACK COVER: Fassett's locoweed at Plainfield Tunnel Channel Lakes State Natural Area. For more information, contact the State Natural Areas Program, Bureau of Endangered Resources, DNR, P.O. Box 7921, Madison, WI 53707 or go to www.dnr.state.wi.us/org/land/er/sna.

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Editor David L. Sperling
Associate Editor Natasha M. Kassulke
Contributing Editor Maureen Mecozzi
Circulation Manager Kathryn A. Kahler
Business Manager Laurel Fisher Steffes
Art Direction Nancy Warnecke, Moonlit Ink
Printing Royle Printing



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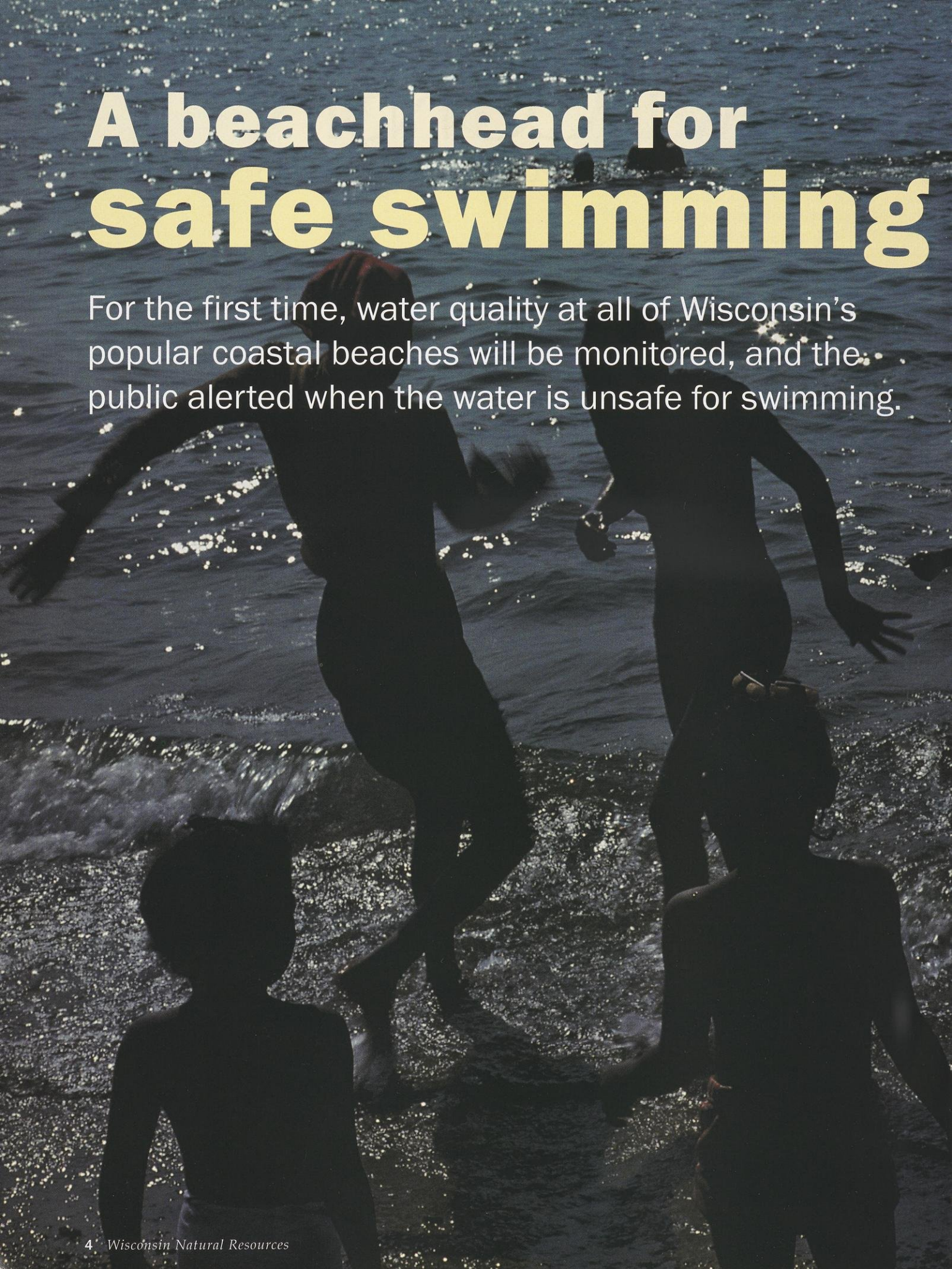
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Governor Jim Doyle

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A photograph showing the silhouettes of several people swimming and wading in the ocean. The scene is backlit by a low sun, creating a shimmering, golden glow on the water's surface. The figures are dark against the bright, rippling water. The overall mood is peaceful and recreational.

A beachhead for safe swimming

For the first time, water quality at all of Wisconsin's popular coastal beaches will be monitored, and the public alerted when the water is unsafe for swimming.



CITY OF RACINE HEALTH DEPARTMENT



(left) The beach is a favorite summer place to beat the heat, but the public can't see when high bacterial counts make the water a riskier place to cool off.

(above) Until this year, only a few health departments in Great Lakes coastal counties tested bacterial safety at least five times weekly and promptly posted their results.

Lisa Gaumnitz

In 2002, fun stopped at the water's edge.

Signs warned swimmers not to use Milwaukee's South Shore Beach due to poor water quality on 50 days, McKinley Beach on 23 days, and Bradford Beach on 21 days. Racine beachgoers were left high and dry on 27 days at North Beach and 22 days at Zoo Beach.

And in a shocker that garnered national headlines, 68 people got sick over the summer from swimming at Door County's seemingly pristine beaches. By summer's end, 13 Door County beaches had been closed for at least a day when tests detected unhealthy conditions.

The unflattering spotlight on Wisconsin's beaches triggered fingerpointing over the source of the contamination and how to stop it. The 2003 beach season opens with a continued search for answers. Fortunately, some important pieces are coming together to assure safer swimming this summer.

For the first time ever, water quality at public beaches along Wisconsin's Great Lakes coast and in all state parks will be regularly tested, and people notified of unsafe swimming conditions. Coastal counties have agreed to follow uniform plans developed by a team of state and local health and environmen-

tal officials and interest groups. In return, the coastal counties will split federal money available through the federal Beaches Environmental Assessment and Coastal Health Act, or BEACH Act, for beach testing and notification on coastal waters.

"Right now, the public is adamant about so many different sources — gulls, sewage overflows, storm water, illegal discharges from boats, pet waste and a number of other things," says Toni Glymph, the DNR toxicologist who led the team. "Everybody has their own opinion, but the data is inadequate to draw conclusions. Since monitoring was not consistently done at most beaches, there has been a lot of pointing fingers and casting blame."

Adds Bill Schuster, the Door County Conservationist: "I think there are some in the public who want one simple answer, one solution. But the science tells us it's far more complex. It's multiple potential sources and it could be different sources for different beaches."

The headlines from summer 2002 moved beach health onto the front burner for many local government, civic and business leaders. They are working the State Capitol and congressional delegations to get funding, attention and action on beach issues.

DNR PHOTO

"The kind of publicity Door County got last year is not conducive to attracting people to live here or locate their business here," says Bill Chaudoir, executive director of the Door County Economic Development Corp. "Our number one asset is our water. We need to eliminate this major barrier to maintaining this great quality of life."

A patchwork system and imperfect tests

Local and tribal health departments are responsible for public beaches within their borders, with the exception of beaches on state properties, which the Department of Natural Resources monitors. The state Department of Health and Family Services (DHFS) gave local governments a model beach monitoring and notification program, but the responsible agencies aren't required to follow it, according to Tom Sieger, director of the DHFS Bureau of Environmental Health. Because monitoring isn't mandatory, and because local governments typically don't have adequate funds to pay for such efforts, Sieger says there has been considerable variation in how frequently beaches are sampled, if at all, and in how people are notified when unsafe swimming conditions are detected.

Among coastal counties, Racine, Kenosha and Milwaukee counties regularly monitored beach water quality for more than 20 years and over time have ratcheted up testing frequency. Last summer, Milwaukee sampled beach water every day and Racine sampled five days a week.

In recent years Manitowoc has conducted regular monitoring, but the rest of the Great Lakes counties with public coastal beaches haven't done so.

"There's been an uneven playing field for a long time," says Bob Bagley, director of Racine's public health laboratory for the last 17 years. "When people saw Racine beaches were closed, they presumed there were health reasons, and that other beaches remained open because their water was clean. Well, they were open because nobody tested. We were being handicapped for doing what was right."

Door County started regularly collecting samples in summer 2002, and sends its samples down to the Laboratory of Hygiene in Madison for analysis.

"In past years we would only test if we had a complaint or illness," says Rhonda Kolberg, director/health officer for Door County. "We haven't had the manpower or the history to show we needed to do testing. But I think everyone knows now we have to test and people are behind it."

The county started regular sampling after DNR alerted health officials to a cluster of illnesses among campers at Peninsula State Park. Subsequent county water tests revealed high bacterial levels in the water at Nicolet Bay Beach. When people reported getting ill after swimming at other Door County beaches, the county expanded the testing effort.

The tests themselves are imperfect tools. Hundreds of organisms cause diseases in humans, but it's difficult and expensive to detect the individual organisms in beach water samples. Testing relies instead on detecting "indicator organisms" that may reveal the presence of bacteria and consequently, pathogens.

Fecal coliform, the indicator organism historically used, is widely found in the environment as well as in the feces of humans and other warm-blooded animals. Wood, for instance, can contain high levels of the bacteria that tests positive for fecal coliforms, so wood debris in the water may cause a spike in a beach water reading, but not pose a threat to human health.

Milwaukee, Racine, and other Wisconsin governments recently switched to using the bacterium *Escherichia coli* as their indicator because it's more specific to humans and animals. But *E. coli* has drawbacks, too. Current tests don't tease out whether a high *E. coli* reading came from human feces or feces from ducks, dogs or some other animal. Consequently, it's difficult to know for certain whether the water contains any human disease-causing organisms. It also takes 24 hours to get test results from *E. coli* sampling.

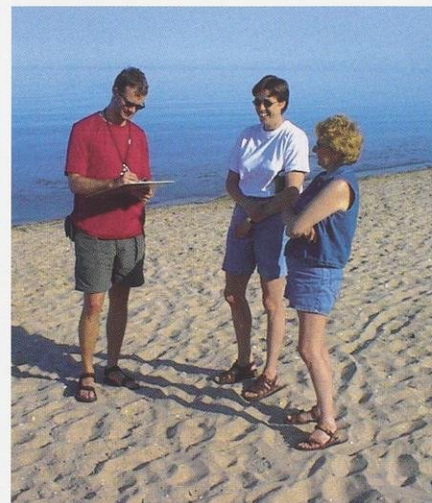
Federal and state officials are working to develop more rapid testing meth-

ods and models to predict when beach waters may be unsafe. Milwaukee and a few other health departments now use such models to help determine whether to close beaches, but even those calls are still made in part on day-old information.

Some water experts say current testing systems are so flawed they should be scrapped, and funding directed instead at finding and controlling pollution sources. Glymph says both monitoring and source identification are needed. When done consistently and uniformly, monitoring can help identify trouble spots and trends, and allow researchers to check how water quality varies after rainstorms, sewage overflows, or other factors.

The lack of historical records makes it difficult to judge if beach health is getting worse and if so, why? Wastewater from cities and industries was previously a big source of water pollution. Daily bacterial loads from such sources have been drastically cut since the 1980s and the number of sewage overflows has been significantly slashed. A July 2002 report by the Legislative Audit Bureau, for example, found that Milwaukee Metropolitan Sewerage District had cut from 50 to about eight the average number of sewer overflows and the volume of those overflows was cut by 81 percent since 1994.

In addition to revamping water tests, researchers asked beach users how posted signs and announcements could be improved so they would quickly get the message as beach water quality changes.



DNR WATER QUALITY STANDARDS SECTION



Where beaches are not regularly monitored, look for signs that can signal contamination. Contact the local health department if you have questions or concerns.

Working toward better testing and notification

The year 2000 amendments to the Clean Water Act responded to growing national concern over beach closings and gastrointestinal illnesses associated with beach water. The legislation, known as the BEACH Act, required states to develop testing and notification programs for coastal waters and made federal

Heather Kelley walks Bayfield's Memorial Park Beach wearing a backpack GPS unit. She and Kaveish Sewalia mapped beaches, measured land slopes and noted potential pollution sources.



DNR WATER QUALITY STANDARDS SECTION

funding available for those efforts. The BEACH Act also required states to choose *E. coli* or *Enterococci* as an indicator organism by April 2004, and to use limits set by the U.S. Environmental Protection Agency (EPA) when deciding to post beaches with health advisories.

The Department of Natural Resources has secured a \$287,000 EPA grant to develop the program and is applying for another \$226,000 grant to help implement the beach health program in counties along Lake Michigan and Lake Superior.

In late 2001, Glymph convened a workgroup with representatives from DHFS, local health departments, and groups with an interest in beach health to gather data on beach use and potential sources of contamination, interview beachgoers, and collect suggestions for improvement. Glymph also hired seasonal help to gather facts. Heather Kelley compiled a list of 60 public coastal beaches, then drove back roads to find

Tips to swimmers to enjoy a safe summer on the beach

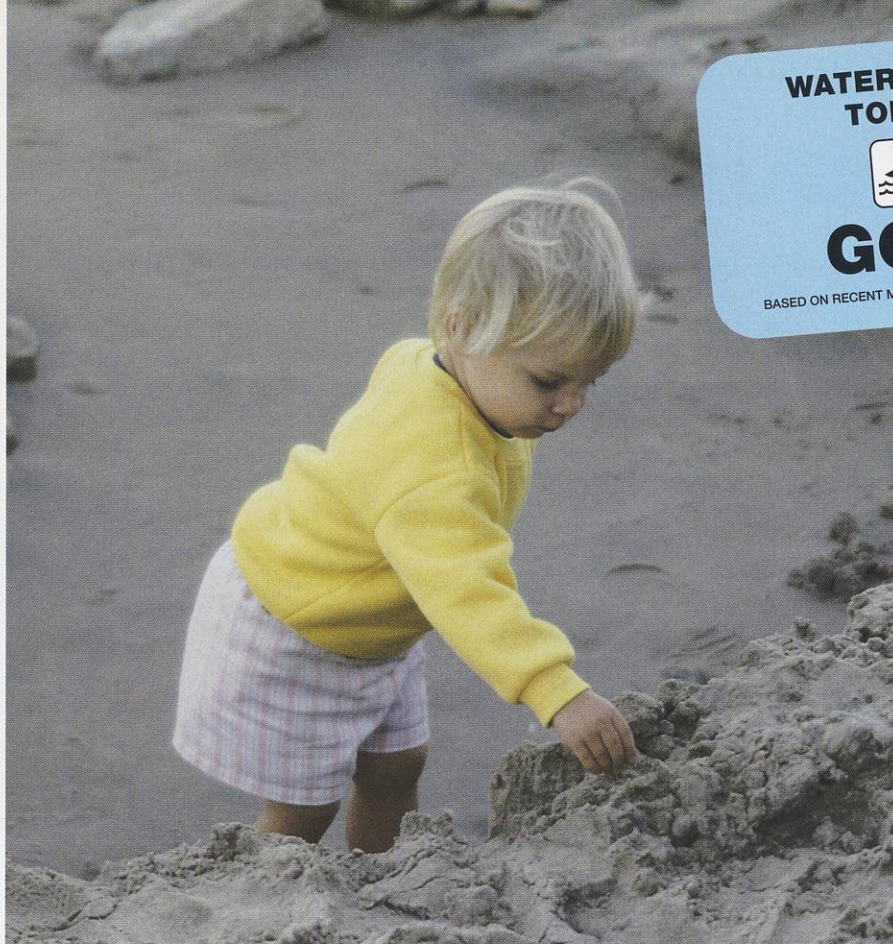
Ask local beach health monitors:

- Which beaches do you monitor and how often?
- What do you test for?
- Where can I see the test results and who can explain them to me?
- What are the primary sources of pollution affecting this beach?

If your beach is not monitored regularly:

- Avoid swimming after a heavy rain.
- Don't swim near storm drains if there are any along or near the beach. Storm drains are pipes that carry rain and snowmelt from streets.
- Look for trash and other signs of pollution such as oil slicks on the water. They may indicate the presence of disease-causing microorganisms that may also have washed into the water.
- Contact local health or environmental protection officials if you think beach water is contaminated, so they can test the water and protect other swimmers from it.
- Report any discharges of trash or sewage from boats.
- Work with local authorities to create a monitoring program.

these sites and ferret out another 113 public beaches that offered car access. She used global positioning satellite technology to map each beach location and tally public beach miles. Kaveish Sewalia visited each beach to gather in-

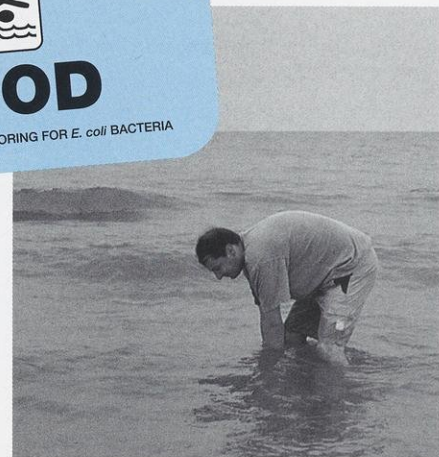


**WATER QUALITY
TODAY IS**



GOOD

BASED ON RECENT MONITORING FOR *E. coli* BACTERIA



CITY OF RACINE HEALTH DEPARTMENT

Signs and sampling are designed to report and measure bacterial counts in shallow waters where young children play.

formation about potential contamination sources. He counted bathers and waterfowl, identified the number and location of storm water and sewer out-fall pipes, and determined beach slopes. Ben Vail surveyed beachgoers to learn if current methods to notify them of beach water conditions were effective, and to collect suggestions for improvements.

In December 2002 and January 2003, Glymph shared the workgroup's proposed plan with citizens in coastal communities. She asked which beaches were a priority for testing, and how people wanted to be notified of beach water quality. The Department of Natural Resources submitted a revised plan to the EPA in March, becoming the first Great Lakes state to finish its plan.

Wisconsin's 180 coastal beaches were categorized into high, medium and low priority based on popularity and risk of contamination. Higher priority beaches will be tested more frequently and counties with more beaches will get more federal aid. Though inland beaches can't qualify for the money, the safety program has been designed to work there as well, pending funding.

Twenty-five high-priority beaches will be tested five times a week — 13 in

Door County, four in Ozaukee County, three in Milwaukee County, two each in Racine and Sheboygan counties, and one in Manitowoc County at Point Beach State Park. Thirty-eight medium-priority beaches will be tested twice weekly and the remaining 117 beaches will be tested once a week or as determined on a case-by-case basis. All state park beaches will be tested at least once a week. State park beaches located on Lake Michigan or Lake Superior that are designated as high or medium priority will be tested accordingly.

Heavy rainfall, sewage leaks, spills, and beaches with elevated bacteria counts would warrant more frequent sampling.

All samples will be collected in the middle of the typical bathing area. For longer beaches, the counties will collect one sample for every 500 meters of beach. Samples will be collected in 24 to 30 inches of water at 6 to 12 inches below the water's surface.

"We want to protect the most vulnerable population, children, so that's why we test in knee-deep water where children are," Glymph says.

Every day, the high-priority beaches will post one of three signs to advise

beachgoers of water quality for that day — good, poor, or closed. "We agreed to post every day so the public can be assured they're getting up-to-date information," Glymph says. "We also don't want beach users to assume the water is safe by default. Posting a sign that says 'good' indicates the water has been tested and found safe."

And bathers soon will be able to check a website (www.Beachhealth.gov) with daily water quality reports for all high-priority beaches on Wisconsin's Great Lakes.

"We certainly view this as a good thing," says Bagley, who served on DNR's beach workgroup. "I think the state is providing a lot of leadership, some standards, and some funding. People should know that the local health people are at least monitoring the water they're swimming in. That's a minimal expectation."

Narrowing the search for sources

When the Southeast Wisconsin Beach Task Force — which includes the Department of Natural Resources, the health departments, Citizens for a Better Environment, the Sixteenth Street Community Health Center, the Great Lakes WATER Institute, Milwaukee Metropolitan Sewerage District (MMSD), and state Rep. Jon Richards — started investigating beach contamination in the late '90s, headlines documented MMSD's release of raw or partially treated sewage

into Lake Michigan and its tributaries after heavy rains to avoid damaging treatment plants or causing sewer backups. Some people speculated the sewage overflows were linked to beach closings as far away as Chicago. EPA concluded in 2002 that it was unlikely that MMSD sewage overflows caused Chicago beach closings.

No definitive studies have established or discredited that link, but one is underway by researchers at the WATER Institute as part of the continuing hunt for pollution sources.

"I had this impression there was this huge amount of contamination in Lake Michigan and we just had to figure out where it was coming from," said Sandra McLellan, an assistant scientist at the University of Wisconsin-Milwaukee's Great Lakes WATER Institute. "People were asking, is it from the farms, is it from sewer overflows, is it from storm sewers? And the answer is yes, yes, and yes."

Water sampling of tributary streams showed high *E. coli* readings after rain-falls and after sewage overflows. Whether these plumes cause a problem at beaches is a big question, McLellan says. For instance, contamination at South Shore Beach in Milwaukee didn't seem to come from the lake: "On many days there was very little *E. coli* coming to the beach," McLellan said. "We'd take 50 samples from different parts of the lake and they'd be clean. But we'd get to the beach, 10 meters from the shore and the *E. coli* readings would be in the thousands."

McLellan is using DNA fingerprinting techniques to determine if the *E. coli* samples found at the beach matched that from gulls. Gull feces carries very high bacterial loads exceeding 340 million *E. coli* cells per gram. Other samples suggested a nearby marina parking lot was a source of contaminants: *E. coli* readings from runoff exceeded 100,000 colonies per 100 milliliters after a rain. Uncovered trashcans at the marina also were a problem. McLellan says the Milwaukee County Parks Department hopes to use a grant to keep contaminated water from the parking lot from entering the lake. Parks staff also changed trash collection policies to help reduce

beach contamination.

This summer McLellan and other researchers hope to get closer to understanding where contamination in the plumes from the tributary rivers is coming from, where it's going, and whether it poses a risk to human health. She'll determine if contamination is coming from human feces or other sources by looking for signs of antibiotic-resistant strains of *E. coli* that more frequently occur in people. Another colleague at the WATER Institute will look for the presence of caffeine, a sign feces are from humans and not from other animals.

Racine researchers found the county's practice of using machinery to pick up beach debris and groom the sand was actually exacerbating the problem. "The *E. coli* levels increased greatly if we flattened and finished off the grooming," Bagley says. "We were effectively burying the seagull feces under the sand where it's moist and warm."

E. coli flourished in the hospitable conditions, and sampling showed that sand within one meter of the water's edge had greater densities of *E. coli* than sediment under the water or in the water itself. This year, Racine beach managers will rake up trash but will leave the turned sand exposed to sun and air. The city also is modifying a nearby storm sewer outfall in hopes of reducing contaminants from that source.

"I got mad, and I got mad at me."

Local citizen groups in Racine, Milwaukee and Door counties actively advocate on behalf of Wisconsin's beaches. "I think the role we play is to be polite, but persistent both with the community at large and community leaders — it's worth investing in our beaches," says Dave White, a member of Racine's Keep Our Beaches Open and of the DNR beach workgroup.

The impetus to form the group came in 1997, when White took out-of-town guests to the beach for his 40th birthday and found it closed. "As if turning 40 wasn't traumatic enough, we got to the beach to find lifeguards patrolling it to keep people out of the water," White recalls. "I got mad, and I got mad at me."

I'm the director of a nature center (River Bend Nature Center) and here was an environmental problem in my community that I hadn't done anything about."

Sixty people came to that first meeting, and the group has since pursued an active agenda of educating themselves and others about beach water quality.

"My background in environmental education leads me to the view that the reason for many environmental problems is the way we live," White says. "I wanted to form an effort that was collaborative and cooperative, not confrontational. I didn't want to assume our civic leaders were just sitting on



Beach groomers that rake then flatten sands seal in bacteria in moist, warm growing conditions. Now Racine crews will aerate sands so sunlight and winds can kill off more bacteria.

their hands, and I found out there was a lot going on."

Keep Our Beaches Open sets up an exhibit at community events and festivals, and visits fourth-grade classrooms to educate children about beach issues. To prompt dog owners to properly dispose of pet waste, group members patrol a park near the main beach, planting next to dog feces a utility flag with the message, "It's cool to pick up the stool."

Five and one-half years later the group still has a good core of tenacious members working to keep Racine beaches safe. "That's good news and bad news," he says. "We didn't expect we'd need to be around this long to solve this problem."

Lisa Gaumnitz is public affairs manager for DNR's water programs.

Realm of the smoke birds

dart and hunt

The black terns of Rat River



STEPHEN J. LANG (INSET) JACK R. BARTHOLOMAI



over Wisconsin marshlands.

Robert J. Zimmer

Thunder grumbled to the east as the heavy blackness of the afternoon storm churned away toward the horizon. Already the rain was ebbing, the dark clouds overhead dissolving quickly as the fast-moving storm drifted eastward. The heat of the mid-afternoon sun quickly returned and with it came the dragonflies. Rising from their sheltering roosts on the undersides of reeds and marsh vegetation, swarms of skimmers, darters and damselflies took wing over the open waters here at Rat River Wildlife Area in Winnebago County. It didn't take long for the black terns to mobilize and take advantage of such a bountiful feast.

They are beautiful birds, silver and smoky black feathers with a flight at once graceful yet frantic, purposeful, playful, innocent, yet deadly accurate. Patrolling the open water back and forth, diving to the surface with lightning speed then cartwheeling into flight once again. The air was soon filled with the soft muted voices of these sociable birds as they greeted one another calmly after the heavy rains, and the sharp, piercing cries of those with more at stake. As far as the woodland edge at the far side of the marsh, the skies were clouded with foraging black terns taking wing after the storm.

Black terns are the only terns that will dart and flit over land looking for insects.

(inset) The chicks are raised in conspicuous floating nests. They will flee into marshy waters at the first sign of predators and adults will dive-bomb the intruders.

"The black tern is a restless waif of the air, flitting about hither and thither with a wayward, desultory flight, light and buoyant as a butterfly. Its darting zigzag flight as it mounts into the air to chase a fluttering moth is suggestive of a flycatcher or a nighthawk; as it skims swiftly over the surface of the water, it reminds me of a swallow; and its true relationship to the terns is shown as it hovers along over the billowy tops of a great sea of tall, waving grasses, dipping down occasionally to snatch an insect from the slender swaying tops."

naturalist Arthur Bent



JACK R. BARTHOLMAI

Tight-knit neighbors in the marsh

Often black terns share the same wetlands and feeding areas as common terns and Forster's terns, and the three appear to coexist peacefully for the most part as they arrow to and fro, bouncing along in masterful flight over the still waters of marshes and lake-shores. Most terns are coastal birds, but the black (*Chlidonias niger*) breeds in freshwater marshes and flies over land hunting down insects and other food.

A nesting colony of black terns is a fascinating and bewildering place. Few birds are as bold or aggressive as the black tern in defense of its eggs, which are usually laid on floating nests of reeds, algae and other marsh vegetation. Colonies vary greatly in size, as does quality of nest construction. Some nests are elaborate and ornate, others are simply a pile of loosely placed plant material. Shrill, sharp cries and angry piercing rattles erupt from the colony as the tiny defenders attack en masse any invader of their precious floating nursery. The excited birds will literally strike an intruder again and again, lining up in flight formation to dive-bomb the uninvited "guest" until the danger has been driven off, quite an impressive and convincing display for such a small, graceful bird!

A rare find

During recent decades, black tern numbers have decreased in many areas due to loss of marsh habitat. Since the 1960s, the North American population has declined sharply as wetlands have been drained. Farm chemicals and urban pollutants running off into nesting areas may also affect hatching success of black terns and other marsh species. In 1978, the black tern made the Blue List, the watch list of the National Audubon Society and a valuable conservation tool for state and federal wildlife agencies. While it appears the key factors that cause declining black tern populations have been identified, their populations remain at low levels.

Here in Wisconsin, the black tern is officially listed as a Species of Special Concern reflecting uncertainty about its

status. This designation does not carry any state legal authority, but the species is protected under the federal Migratory Bird Treaty Act of 1918, making it a federal crime to kill the bird.

Wisconsin is fortunate to host some of the largest black tern colonies in the Midwest region, attracting researchers and biologists from other states to study, band and record observations. Well-established colonies include those located at Horicon Marsh (Dodge County), Navarino Wildlife Area (Shawano County), Rat River Wildlife Area (Winnebago County), Oconto Marsh (Oconto County), Grassy Lake (Columbia County) and the Winneconne/Lake Poygan area (Winnebago/Waushara counties).



JACK R. BARTHOLMAI



JACK R. BARTHOLMAI

Adults stay on the move returning to the nest just long enough to drop off a dragonfly meal. (left) Banding studies will help establish if the black tern populations and range are expanding in Wisconsin.

The season of change

It's late summer at Rat River and the smoke birds show signs of restlessness. The young of the year are flying now and often the entire colony is in the air at once, swirling and darting as a massive school, moving as one. They bunch together, pull apart, cyclone back together, then suddenly rise up and disappear into the distance. Birdwatchers up for a challenge delight in the fascinating variations of black tern plumage as young and old transform into alternate winter coats. Feathers on their head and underparts change to white with dusky smudges on the eyes and

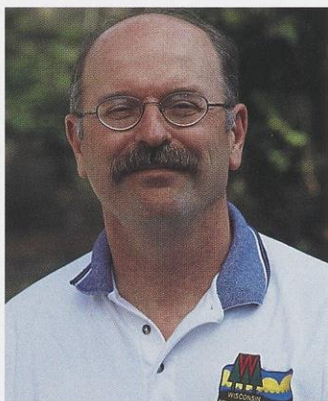
Their restless behavior and the plumage change signal that another breeding season has come and gone. Starting in early fall, the smoke birds will be gone from these vital marshlands, making long migrations to the sunny, warm northern coasts of South America. They'll stay until May when spring breezes once again bring black terns back to Wisconsin.

Writer Robert J. Zimmer lives in Neenah.

A year with CWD

Wildlife Director Tom Hauge recounts how far we've come and where we are headed in continuing efforts to curb, explain and contain chronic wasting disease in Wisconsin's white-tailed deer herd.

Editor's note: At winter's end, DNR Wildlife Director Tom Hauge provided the Natural Resources Board with a one-year retrospective of lessons learned while attempting to contain an outbreak of chronic wasting disease. He thanked dedicated professionals and volunteers working to understand the disease, and he reflected on efforts to map its spread, work with the public to limit or contain the disease, and work with many partners to help people calmly assess the risks this wildlife disease may pose.



Tom Hauge PHOTO BY ROBERT QUEEN

Friday, February 28th was the one-year anniversary of the news that chronic wasting disease was present in Wisconsin, and life has been a blur for 12 months since that discovery. I'd like to reflect on how far we've come because it has happened so quickly.

A year ago folks were unsure what we meant by chronic wasting disease (CWD) and now our citizens are among the most educated in the country with regard to this disease. That was accomplished through the efforts of agencies, universities, media and other partners to educate by websites, articles, and spring and fall public meetings. We set national attendance records for getting people to come together to discuss and

learn about the disease.

Also for the first time, a Wisconsin governor went to Washington to address a congressional committee on a wildlife disease issue. And a captive wildlife bill that languished in legislative committees for years was finally passed. It is an important tool for protecting the health of Wisconsin wildlife and domestic cattle. Further, our partners in the state Department of Agriculture have passed stronger health testing rules for captive cervids that will help us down the road.

Through quick state and federal investment, we now have an up-to-date laboratory that will help us determine how susceptible Wisconsin whitetails are to the disease. In less than a year, we went from being a state with no capacity to analyze for CWD to a program that is analyzing more deer for CWD than any state in the nation.

We are sharing those test results as rapidly as possible with hunters who submitted those samples and the general public, especially those living in small areas of southwestern Wisconsin where the disease is most prevalent. Our website updates testing results weekly in charts and maps. Our publication "Understanding Chronic Wasting Disease" was widely distributed, and our new newspaper summary "CWD Update" was inserted in community newspapers within the CWD

Eradication Zone to continue educational efforts.

Law enforcement programs have conducted a thorough audit of white-tailed deer farms in Wisconsin to establish a baseline of standard practices in that business as we turn over regulation of that industry to the Department of Agriculture, Trade and Consumer Protection. Our investigations show there is still room for progress. Investigations by DNR wardens summarized in this "Statewide Audit and Inspection of Wisconsin's Captive Whitetail Deer Farms," show that more than 16,000 whitetails are kept on Wisconsin's 639 licensed deer farms. At least 671 deer have escaped from the 550 deer farms investigated. At least 436 of these deer were not recovered. Some 1,222 deer died on deer farms in the last three years. Since testing to determine the cause of death is not mandatory, many game farm operators do not choose to do post-mortem exams.

Special efforts last summer

We had four summer hunts that had an excellent safety record. And we answered questions from local, state, national and international media interested in our efforts to contain this disease.

Twelve hundred people stepped forward last fall to collect 39,000 deer heads that were sampled for this disease and put its risks into perspective. Now we also have set up a website for people who want to learn about the disease and check on testing results.

We've offered a lot of counsel to other states who want to see if methods that worked here might work for them in understanding the spread and risks of this disease.

INFLUENZA

We got special appropriations from the legislature and we conducted a risk assessment for placing deer carcasses in landfills. Further, we developed a disposal plan to freeze carcasses until we know a deer's health status before that carcass is incinerated, a strategy we call the "frost and toast" method.

We've taken a science-based approach to investigate disease spread, and we have been very open in sharing those test results quickly. Together with our partners in the hunting community and reporters, we've had success. Many people understand that we needed help from the hunting public to collect deer. We have had great landowner cooperation throughout this effort too. Though we can get caught up in the affairs of the day, we need to reflect and appreciate what has happened and how well both the staff and public have responded. I want to thank my colleagues and other citizens of Wisconsin for these accomplishments.

As we move into current events, an extended hunting season in the CWD Eradication Zone ended January 31st, and in February and March we offered

landowners nearly 1,600 permits and harvested at least 566 deer this winter season (final tally 666 deer) in the Eradication Zone. We hunted over bait at approximately 270 controlled bait sites and have taken an additional 300 deer, mostly on private land.

Snow cover and helicopter surveys provided a little time to update our population estimates in the Eradication Zone. We clearly would have benefitted from longer and earlier snow cover for this work.

We have rules in progress for managing CWD in whitetails that include 17 public hearings in March. We also published an environmental impact statement on those rules that will be reviewed at the hearings.

We continue to make steady progress in testing the sampled deer and I'm confident we will make our goal of getting results for all of the out-state samples by the end of March.

And for the future?

For those who would better understand the spread of CWD by seeing a picture, we're adding maps to our website that allow the viewer to search for

CWD testing results by county, village or deer management unit to pinpoint where we have collected samples and where animals found to carry CWD were taken.

We will continue consulting with out-of-state CWD researchers and will review our program plans with these experts in April. That sampling and analysis will give us a high degree of confidence to define where CWD has been detected and where the disease may have infected as small as one percent of the deer herd. Recall that in the Mount Horeb area, we estimate that slightly less than two percent of the deer herd carries CWD. If any other area of the state has CWD at the same level, we would certainly expect to have detected it with this extensive sampling effort.

The University of Wisconsin and DNR continue to do research to trap and radio-collar deer to track the range of bucks and does in the Eradication Zone. Forty-three deer were collared, though we had hopes of collaring 60 animals for our telemetry studies.

Understanding the consequences of

More than 1,200 people collected samples from more than 39,000 deer for CWD testing last fall. Brainstem, muscle and lymph node tissues were analyzed for signs of CWD prions. Analysis indicates the disease in wild deer is limited to a small area of southwestern Wisconsin where fewer than two percent of white-tailed deer are infected.



ROBERT QUEEN

CWD in Wisconsin also means understanding hunters' concerns about it. The Department of Natural Resources contracted with the University of Wisconsin Survey Research Center to gauge how CWD has affected hunters' attitudes and actions about deer hunting. We now have a better idea of why some people chose to hunt or not hunt this last year, how hunters rate the risk of CWD exposure compared to other risks they accept, and attitudes about deer baiting and feeding in different regions of the state. Those results will be available to anyone who wants to understand the changing nature of our hunting culture following this disease outbreak by reading "Chronic Wasting Disease in Wisconsin and the 2002 Hunting Season: Gun Deer Hunters' First Response."

Aims in herd control

Those results give us confidence that people expect the state to continue taking actions to control the spread of CWD in the deer herd. Doing nothing is not acceptable to the Wisconsin populace. They are comfortable with having us do more research. They favor reducing the deer herd. They clearly prefer solutions that expand opportunities for hunters to take deer or claim bounties rather than relying on government sharpshooters to cull the herd.

Clearly in managing our deer herd into the future, we will be proposing options to further reduce the herd size. We know that changing hunting seasons is unpopular and many deer hunters regard the nine-day season as part of their hunting tradition. Even under optimal weather conditions, hunters historically have not reduced the herd sufficiently in a nine-day season.

Hunters statewide repeatedly told us during the Deer 2000 meetings that they wanted a predictable, consistent, expanded season that reduces the need for special herd control seasons each year. We want a longer standard season that requires fewer Zone T hunting units, fewer Earn-A-Buck units, and simpler rules for hunters. We know that starting the gun deer season earlier is unpopular with bowhunters and ex-

tending the season later is unpopular with snowmobilers, but both groups will have to give a little and compromises will be reached. Maintaining the present nine-day season will simply keep our deer population well over goal.

We need to provide hunters with greater opportunity to harvest deer with the most effective weapon while

maintaining special Zone T and Earn-A-Buck provisions for the times and places when we need it. Let's give people more days to hunt. We are more likely to catch rut activity and would avoid some of the conflict with other seasons. This is but one of the changes we will need to make to adapt to this wildlife emergency. ▀

Editor's note: A month after Mr. Hauge's address, the first year of shooting and collecting deer ended quietly on March 31st. Wildlife biologists hope to reduce the deer herd size as much as possible to contain and possibly eliminate the disease. The tally of these hunts follows:

- Four weeklong summer hunts were held in June, July, August and September in the Eradication Zone of eastern Iowa County, western Dane County and a small portion of Sauk County.
- A fall gun deer hunting season ran from October 24, 2002 through January 31, 2003 to further depopulate deer in the Eradication Zone.
- Wildlife officials got approval to allow landowners, their hunting partners and government shooters to shoot deer over tended bait piles from mid-February through the end of March.

Preliminary tallies show that with all these efforts 9,287 deer were removed by 7,200 hunters from an estimated population of 16,400–17,900 deer in the Eradication Zone — the intensive hunting effort removed an estimated 40 percent of the herd. Taking into account the hunt and other sources of deer mortality, wildlife biologists estimate the current deer herd in the Eradication Zone is between 8,700 to 10,200 animals. Fawns born this spring are expected to bring the population to between 12,000 to 14,000 deer by fall of 2003.

"Looking ahead to this fall, after factoring in expected fawns this spring, we expect the population in the zone will be down about 25 percent from what it was last fall," said DNR Wildlife Ecologist Bill Vander Zouwen. Sharply reducing the deer population in this zone where infected animals have been detected will remain an important goal in Wisconsin's continuing attempts to eradicate this disease.

At its April 2003 meeting, following meetings with nationwide CWD experts and public testimony on CWD regulations, the Natural Resources Board approved further staff recommendations to manage CWD in Wisconsin. Those steps include extending the Eradication Zone from 411 square miles of southwestern Wisconsin to 872 square miles to maintain a goal of eliminating CWD within a 4.5-mile radius of locations where whitetails have tested positive for the disease. Rules also seek to limit deer populations to 10 animals per square mile of deer range within a Herd Reduction (Management) Zone, and continuing a statewide ban on baiting or feeding deer. The recommendations are currently being reviewed by the State Legislature.



Sharpshooters tended baited areas within the Eradication Zone to remove as many deer as possible through March. Extended hunting seasons and special shoots reduced the deer population about 25 percent in regions where CWD has been detected.

DNR PHOTO



Reining in polluted runoff Wisconsin moves from the law to the land



Hundreds of hours, thousands of words

Unwrapping Wisconsin's polluted runoff rules.

Virginia Mayo Black

On October 1, 2002, years of discussions, hundreds of hours in meetings and public hearings, and thousands of comments from throughout Wisconsin were transformed into a package of rules to stem the No. 1 water pollution problem in the state and the nation — polluted runoff.

Wisconsin's runoff statistics are well known. Polluted runoff, also known as nonpoint source pollution, continues to degrade or threaten about 40 percent of the state's 44,000 miles of streams and rivers, and about 90 percent of the state's 15,037 inland lakes. It's the rare Great Lakes harbor that does not show some effects from runoff. Even wetland areas and groundwater resources in Wisconsin are adversely affected. Where there's water, it's likely there will be some degree of runoff.

The state's runoff rules are arguably the nation's most comprehensive and are an outgrowth of the Clean Water Act of 1972. The shift from voluntary regional controls to uniform statewide standards reflects an understanding that runoff reaches throughout the state.

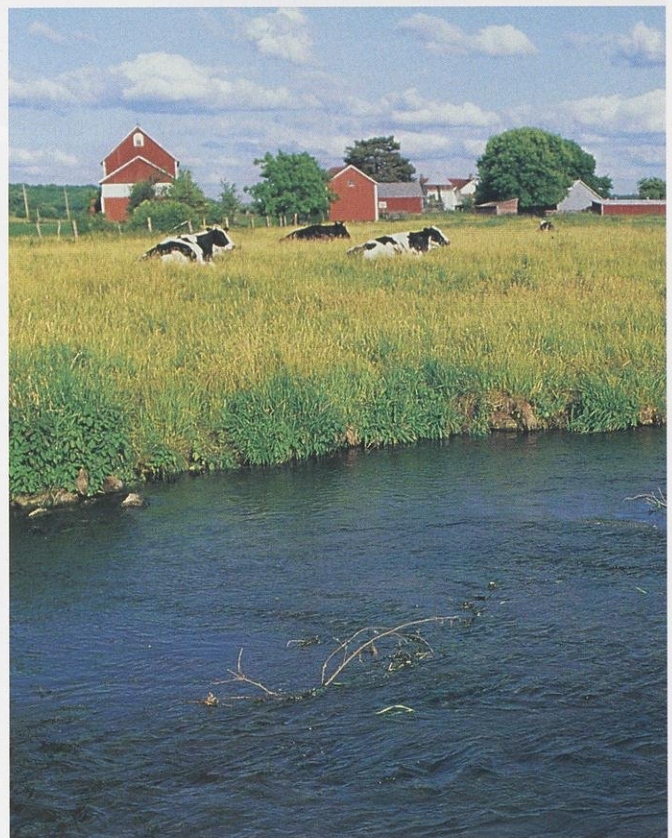
As other states face the challenges of addressing runoff regulations, Wisconsin has completed its first phase. Difficult decisions have been made here. Rules that diverse constituencies could live and work with received legislative approval in early 2002.

The ordinary nature of runoff pollution masks its tenacious and pervasive qualities. Runoff does not have an easily identifiable source. Its sources are the stuff of everyday life: lawn fertilizer that is not fully absorbed by grass; oil, antifreeze, and other substances that fall onto parking lots; erosion from a streambank, shoreline, or drainage ditch; soil from construction projects that finds its way to area waterways; pet waste and livestock manure; even unmulched leaves and grass clippings that travel unimpeded through storm sewers.

When these nutrient-rich substances find their way into streams, lakes and wetlands via rainfall and snowmelt, the results can be devastating. Excess nutrients can signal the death of desirable plant species, fish and underwater creatures.



DEAN TVEDT



ROBERT QUEEN

Runoff and its resulting problems affect virtually all areas of the state — from urban landscapes of houses and streets to rural fields. The comprehensive administrative rules adopted in early 2002 are designed to address the myriad of problems created by this form of water pollution. The polluted runoff rules support pasture and streambank practices such as the example (above) on Black Earth Creek that allows cattle and creek to co-exist and thrive.

The price paid for allowing runoff pollution is high. Ask any lakefront homeowner or vacationer who finds a lake full of algae blooms. Ask someone who enjoys the outdoors but sees a fish kill. Ask someone who has been dissuaded from swimming or boating by sheets of smelly weeds or who has suffered through a bout of swimmer's itch at a Lake Michigan beach, at Devil's Lake or at other inland lakes. Ask coastal community officials who must try to come up with scarce public dollars for harbor dredging. Or ask officials from states whose waters flow into the Mississippi River Basin about the multi-billion-dollar price tag they face to get rid of a persistent "dead zone" that surfaces annually in the Gulf of Mexico, the result of polluted runoff.

The pay-out from runoff pollution for restocking streams after a fish kill, frequent harbor dredging, or actual cleanup efforts, carries a much higher cost than controlling the problem at its source.

Wisconsin's runoff rules have become more than a discussion topic. They're a reality for communities that are required to control storm water and they're a part of the way businesses and agricultural interests must operate. Fortunately there is financial assistance to bring about needed changes.

Three grant programs administered by the Department of Natural Resources provide financial support to landowners and municipal governments. Farmers and agricultural interests also have assurance that a substantial portion of any Best Management Practice (BMP) they are required to install to address runoff problems will be funded.

Todd Ambs, former executive director of the River Alliance of Wisconsin who now administers DNR's Water Division, played an integral role in the rules process and for him, the rules represent a major accomplishment on behalf of the people of the state.

"If you live in Wisconsin, you will be affected by these rules," Ambs says. "But that shouldn't be considered a negative. If you live in Wisconsin, you are already affected by polluted runoff. Working together with local governments and particularly the land and water conservation districts, I know we will make significant progress in assuring the health of our waterways."

One of the legacies of prior runoff programs is the growing number of farmers who share their success stories that allow them to work the land and successfully protect the environment. The commitment to research holds the promise of giving farmers practical answers they need and financial help to continue their role as land and water stewards.

"A prominent example of this is the Discovery Farms program where research farms throughout Wisconsin look at the environmental benefits of installing and carrying out Best Management Practices," says Russ Rasmussen, chief of the Runoff Management Section.

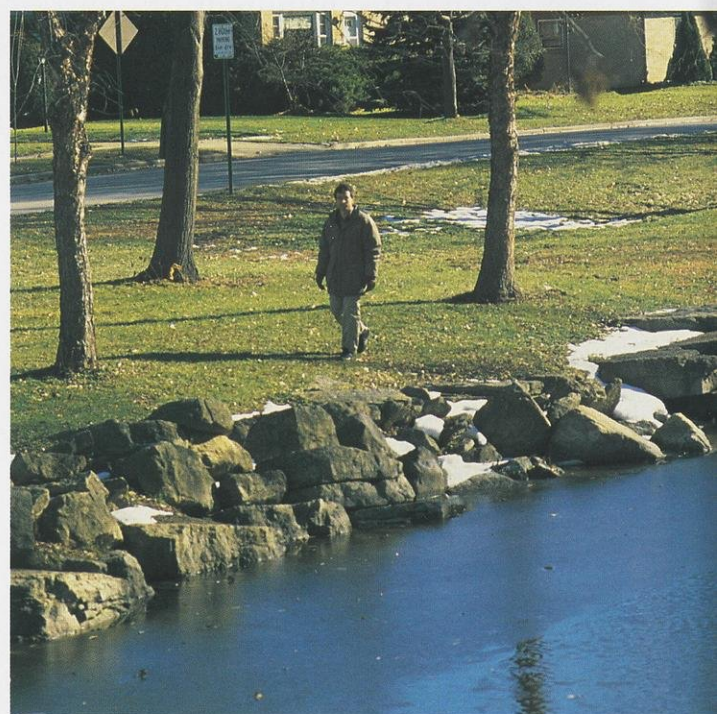
There's a renewed commitment by everyone involved with the rules to come up with practical solutions and approaches that are not excessively burdensome and address the problems associated with runoff pollution.

"The key is to maintain momentum," says Al Shea, director of the Bureau of Watershed Management. "The Department of

Natural Resources, state agriculture department people, and Natural Resources Conservation Service staff are working together to ensure that we can deliver coordinated programs to implement the rules and meet performance standards."

Virginia Mayo Black is a DNR publications editor and communicator for the Water Division.

(below) The typical sight of someone walking along an urban waterway lined with large boulders is an example of heavy armoring that sometimes must be used as an urban Best Management Practice (BMP) to stabilize a streambank from the impact of increased runoff flows created by urban development. (bottom) A wet detention pond is a practice used to settle out pollutants and to detain storm water.





ROBERT QUEEN

Wisconsin's runoff rules at a glance

Nine rules form a comprehensive approach toward controlling runoff pollution. Here's a guide.

- NR 151** is the rules package heart and soul. It contains nonagricultural standards (affecting the people who live in cities, villages, and towns, including building construction), standards and prohibitions for agricultural practices (affecting small and large farmers and agribusiness operations such as feedlots), and runoff pollution standards for transportation facilities (such as streets and highways, airports, railroads, and other mass transit facilities).
- NR 120** changes link the Priority Watershed and Priority Lake Programs (which are winding down) and the newer, more comprehensive approach of the runoff rules.
- NR 152** contains two model ordinances that municipalities can adopt to set erosion controls during and after construction.
- NR 153** contains the Targeted Runoff Management (TRM) Grant Program provisions. TRM grants partially fund activities to reduce both agricultural and urban polluted runoff.
- NR 155** contains the Urban Nonpoint Source Water Pollution Abatement and Storm Water Management Grant Program provisions. The Urban NPS grants are awarded to local government to control both pipeline and polluted runoff from existing development.
- NR 154** lists details about Best Management Practices and cost-share conditions for funding under grant programs.
- NR 216** changes link the nonagricultural performance standards to the storm water discharge permit process for cities and construction sites.
- NR 243** changes require agricultural operations that must apply for Wisconsin Pollutant Discharge Elimination System permits to meet the agricultural performance standards and prohibitions.
- ATCP 50** identifies conservation practices for farmers to meet agricultural performance standards and prohibitions.

— Compiled by Virginia Mayo Black

From BMPs to storm sewers

Understanding phrases that flow from polluted runoff.

Nonpoint source pollution — Pollution that cannot be traced to a single, identifiable source such as a pipe or a factory. Also known as polluted runoff, nonpoint source pollution is generated from a wide range of sources: roofs, streets and highways, yards, driveways, construction sites and farm fields.

BMPs — Best Management Practices. Practices, techniques or measures that avoid or minimize soil, sediment and pollutants carried in runoff to water. BMPs can be temporary, such as hay bales or silt fencing to control erosion during construction, or permanent, like detention ponds or grassy buffers along waterways. Other BMPs are “good housekeeping” solutions such as street sweeping. Some BMPs that might be used on a farm include structures like concrete barnyards or manure storage containers and nonstructural practices like conservation tillage and wetland restoration.

Watershed — A land area that drains water into a stream, river or lake. The watershed for a major river may encompass a number of smaller watersheds that ultimately combine at a common point. Everyone lives in a watershed, and the physical characteristics of the watershed and the kinds of activities that take place in a watershed ultimately affect the quality and potability of the area’s water.

Performance standards — The criteria by which a stated goal is measured. NR 151 includes specific performance standards affecting urban, agricultural and transportation activities.

Technical standards — Documents that detail how to design, build and maintain BMPs.

Storm sewer — An underground pipe or an open system, usually separate from a community’s sanitary system. Storm sewers are designed to move rain, melted snow and street wash out of urban neighborhoods. Water that flows into storm sewers goes directly into an area’s waterways.

— Compiled by Virginia Mayo Black



DNR FILE PHOTO

The storm sewer inlet is the usual way storm water exits a neighborhood and then flows directly into a lake or stream. Material collected on the street also gets washed into these inlets and flows directly into a lake or stream. Since runoff entering these storm sewer systems are not treated, discharging any waste including automotive fluids is illegal. (above right) Highway construction projects must be designed and managed to minimize impacts on lakes, streams and wetlands.

Evolution of controlling polluted runoff

Congress passes the Clean Water Act, making it illegal to discharge pollutants without permission and permits, and establishes goals to make the nation’s waters fishable and swimmable by 1983.

1972

1977

The Wisconsin Legislature creates the Nonpoint Source Water Pollution (Priority Watershed) Program which becomes a national model by offering to share costs with landowners and communities that voluntarily take steps to keep soil, nutrients and construction site sediment from washing into streams and lakes.

Congress amends the Clean Water Act to classify certain storm water discharges as regulated point sources, requiring permits to control pollutants in storm water.

1987



ROBERT QUEEN

About those runoff rules

- Legislation passed in 1997 ended selection of additional priority watershed projects, but existing projects will continue until the last projects end in 2009.
- Performance standards don't yet address road salt, forestry or pesticides.
- The rules became effective October 1, 2002, but not all performance standards became effective on that date. Standards that apply to post-construction storm water management, turf management and developed urban areas will be phased-in over time.
- Construction erosion controls are applied through Wisconsin departments of Transportation, Commerce and Natural Resources.
- Grants included in these rules are not given directly to individuals, but to local government. These cities, towns and villages can in turn award grants to individuals.
- These rules address water quality in storm water, not flooding or inadequate water supplies.

— Carol Holden is an education coordinator for the DNR Water Program.

A state Animal Waste Advisory Committee develops guidelines and prohibitions aimed at promoting environmentally sound manure management.

1993

The state legislature strengthens the Priority Watershed Program by requiring that "critical sites" of pollution be controlled.

1994

1997 & 1999

Wisconsin passes sweeping legislation to redesign its nonpoint source program to make it applicable statewide.

2002

Wisconsin's Natural Resources Board adopts a comprehensive rules package aimed at reducing polluted runoff from farms, urban areas, construction sites and other rural and urban sources.

— compiled by Carol Holden, an education coordinator, and Lisa Gaumnitz, a public affairs manager for the DNR Water Program.

Keeping nutrients down on the farm

Farmers are working to keep manure and soil out of the creek.

Carol Holden

What will the new regulations mean for Wisconsin farmers? Soil and its nutrients are among the farm's most valuable assets. But sometimes those assets turn to liabilities when rainfall or snowmelt wash them into the nearest creek or lake.

Keeping livestock manure and soil out of the water and keeping clean water clean are basic tenets of the agricultural performance standards and manure management prohibitions — key provisions of the new regulations. By meeting these standards, farmers not only protect water quality, but protect their soils and nutrients as well.

The new standards and prohibitions apply to farms large and small. Livestock operations with 1,000 or more "animal units" are required to have a state discharge permit that will include standards to manage manure (1,000 animal units = 1,000 beef cattle, or 710 dairy cows, or 2,500 hogs (55 pounds or over), or 55,000 turkeys, or 200,000 broiler chickens).

To meet the performance standards, some farmers may need to change tillage methods to bring their field's soil erosion down to tolerable rates. Many livestock producers may need to take extra steps to ensure that manure is managed in an environmentally sound way. That means no manure stacks near waterbodies (300 feet from a stream, 1,000 feet from a lake or areas susceptible to groundwater contamination) or making sure that manure from feedlots or barnyards doesn't directly flow into waterways. Cattle access to state waters will be restricted to protect shoreline plants, and starting in 2005, producers will need to follow prescribed plans if they

spread manure or other fertilizers on their fields.

Although the rules do not require manure storage, it may be necessary to build a holding structure or enlarge an existing one to properly contain the manure from a livestock operation. If a manure storage structure is needed, the operator will need to ensure that any new construction, maintenance or abandonment of a structure meets accepted standards. Structures that are failing or leaking and pose an imminent threat to public health, fish and aquatic life or groundwater must be upgraded, replaced or properly abandoned.

Most agricultural performance standards can only be enforced if the state has offered to share at least 70 percent of the cost with the noncompliant landowner. The cost-sharing amount can go as high as 90 percent if the farmer demonstrates economic hardship. Livestock operations that are required to have a discharge permit are not eligible for cost-sharing to meet the conditions of their permits, but may be able to have other costs partially covered such as conservation tillage practices. Once a cropland or livestock operation meets a performance standard, the standard must be maintained in perpetuity without cost-sharing, even if land ownership changes.

The task of moving the performance standards from paper to farm practices will mean that major players such as county land conservation departments, the Department of Natural Resources, the Department of Agriculture, Trade and Consumer Protection, and the Natural Resources Conservation Service must work cooperatively. County staff will play a key role in helping landowners meet these new requirements. Farmers may find themselves dealing with DNR staff in some cases where the county is unwilling or unable to work with a landowner to achieve compliance. The Department of Natural Resources also will continue to work with landowners to meet standards at large livestock facilities and other livestock operations covered by WPDES permits.

One standard that would have required buffers along rural waterbodies was put on hold pending research on their effectiveness under Wisconsin conditions. Buffers are, however, voluntary and eligible for cost-sharing and a one-time payment of \$500 an acre. After the University of Wisconsin completes its research, the Department of Natural Resources will draft an "agricultural riparian buffer performance standard" by the end of 2007 that will be based on the research results.

"The runoff performance standards are really a work in progress," says DNR Runoff Management Section Chief Russ Rasmussen. "As we learn more and gain experience, we will make continual improvements that ensure we get the best water quality return on our investment."

Carol Holden is a DNR Water Program education coordinator.



DNR FILE PHOTO

Contour plowing and strip-cropping are two ways farmers can minimize runoff from their fields.

tion) or making sure that manure from feedlots or barnyards doesn't directly flow into waterways. Cattle access to state waters will be restricted to protect shoreline plants, and starting in 2005, producers will need to follow prescribed plans if they

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Pendarvis — *Fortitude*

Location: On Shake Rag Street in historic Mineral Point, in Iowa County.

Phone: 608-987-2122 ~ **Email:** pendarvis@whs.wisc.edu

A hardy band of Cornish miners flocked to Mineral Point in the 1830s and '40s to work the mines of the newly established Wisconsin Territory. They built quaint stone-and-log houses that mirrored those they left behind. A treasured few remain today at Pendarvis. The historic mine hill still overlooks the scene, and a restored 43-acre prairie speaks serenely of a time before settlement. Explore Pendarvis and a chapter of Wisconsin history nearly lost forever.

Old World Wisconsin — *Determination*

Location: On Highway 67, 1.5 miles south of Eagle, in Waukesha County.

Phone: 262-594-6300 ~ **Email:** oww@whs.wisc.edu

The westward migration of pioneers swept across the Midwest like a tidal wave in the nineteenth century. At Old World Wisconsin, visitors are immersed in historical scenes of farm and village life re-created by authentically costumed staff. Working farmsteads and settlements represent German, Finnish, Norwegian, Danish, Polish, Yankee, and African-American immigration. Hiking trails, a museum gift shop and the historic Clausing Barn Restaurant make the day complete. Visit yesterday today, at Old World Wisconsin!

Stonefield — *Enterprise*

Location: On County Highway VV, alongside the Mississippi River, one mile north of Cassville in Grant County.

Phone: 608-725-5210 ~ **Email:** stonefield@whs.wisc.edu

Here Wisconsin's first governor, Nelson Dewey, operated a 2,000-acre estate he called Stonefield. The historic site that now occupies the same ground is a re-created 1900s farming village, which includes a confectionery, saloon, livery stable, newspaper office, and working farm, among other buildings common to this era. A walk through the State Agricultural Museum and museum gift shop followed by lunch atop the bluffs of Nelson Dewey State Park make for a splendid day of history revisited at Stonefield.

Madeline Island Historical Museum — *Wanderlust*

Location: In the heart of the historic village of La Pointe on Madeline Island, three miles offshore from Bayfield.

Phone: 715-747-2415 ~ **Email:** madeline@whs.wisc.edu

Madeline Island provided the setting for some of the first recorded encounters between French voyageurs and the native Ojibwe people, beginning about 1659. The fur trade flourished here for two hundred years but the Apostle Islands also lured missionaries, loggers, fishermen, and eventually summer visitors known as cottagers. Today, exhibits of rare and one-of-a-kind artifacts tell the story of the area's exploration and settlement, from prehistory to present day. Board a Madeline Island ferry boat for a pleasant cruise into Wisconsin's past.

Wade House — *Courage*

Location: Just off Highway 23 midway between Fond du Lac and Sheboygan in Sheboygan County.

Phone: 920-526-3271 ~ **Email:** wadehouse@whs.wisc.edu

Many travelers who braved the arduous journey from Sheboygan to Fond du Lac in the 1860s stopped at the Wade House stagecoach inn. Today the inn still regales visitors with the story of Wisconsin settlement. The Wesley Jung Carriage Museum displays more than 100 carriages



Wisconsin at Wisconsin's Historic Sites.

and working wagons, and the working water-powered Herrling sawmill is a sight to behold. The Wade House Civil War Weekend is Wisconsin's largest Civil War Encampment and battle reenactment. History truly lives and breathes at Wade House.

Villa Louis — *Ambition*

Location: On the banks of the Mississippi River in Prairie du Chien, in Crawford County.

Phone: 608-326-2721 ~ **Email:** villalouis@whs.wisc.edu

This hilltop mansion, built by descendants of pioneer fur trader Hercules Dousman, is furnished with elegant antiques, fine art, and exquisite heirlooms, most of it original to the Dousman household. Recently restored to its British Arts-and-Crafts décor of the 1890s, the Villa Louis is one of the most authentically decorated Victorian house museums in the nation.

H.H. BENNETT — *Ingenuity*

Location: 215 Broadway, downtown in Wisconsin Dells' River District, in Columbia County.

Phone: 608-253-3523 ~ **Email:** hhbennett@whs.wisc.edu

H. H. Bennett was an unlikely pioneer who packed a camera, not plowshares, and built a simple brick-facade photography studio in the little village of Kilbourn City in 1875. He spent his career capturing the magnificence of what is now known as the Wisconsin Dells with cameras he made by hand. His pictures, particularly his three-dimensional stereo views, drew tourists by the trainload. It is here that you will still discover "the soul of the Dells" through the eyes of Wisconsin's most famous photographer!

First Capitol

Location: In southwest Wisconsin on County Highway G near Belmont, in LaFayette County.

Phone: 608-987-2122

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ROBERT QUEEN

(above) A rain gutter and downspout keep water away from the manure of the adjacent feedlot. (below left) Mixing pesticides and other farm chemicals on a concrete surface increases the chance that spills can be successfully cleaned up. (below right) A vegetative buffer surrounding a field is one of the most effective BMPs for keeping manure and other nutrients on the field and out of adjacent waterways.



(BOTH PHOTOS) ROBERT QUEEN

Putting money behind policy

Public financing is critical to moving polluted runoff rules to reality.

Lisa Gaumnitz

Cleaning up Wisconsin's lakes and rivers depends heavily on giving farmers like Rudy and Marcella Stadler a helping hand.

The Ozaukee County livestock farmers spent \$15,000 and the county \$40,000 to improve their barnyard and build a covered manure storage pit to keep their livestock and the animals' manure out of a picturesque reach of the Milwaukee River.

"We figured that as long as the government was going to pay a good portion of it, we'd go ahead and have it done," Marcella Stadler says. "Cost sharing was a big part of it."

A decade since that cooperative investment, public financing remains a critical component of reducing runoff from private lands. In fact, it's the linchpin of new rules to reduce runoff from farms. The rules for existing livestock facilities and cropland practices can't be enforced against farmers unless the government has offered to pay at least 70 percent of the cost of installing or implementing methods to keep soil and manure on the land.

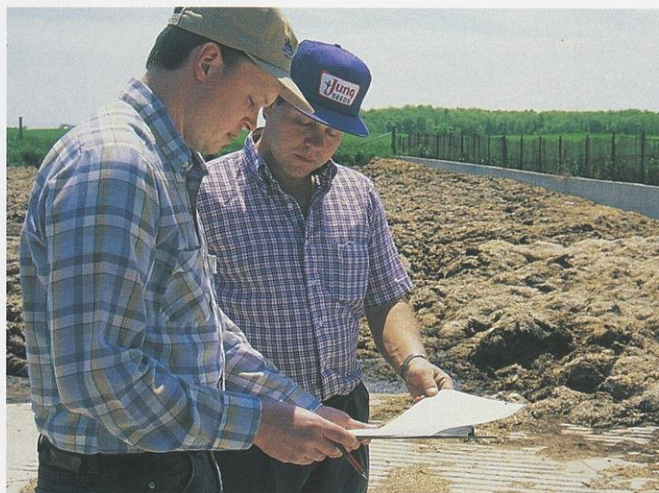
"Without the funding, there's really no rule," says Ozaukee County Conservationist Andy Holschbach. "For us to do our jobs at the county level, the funding is of the utmost importance."

"With the price of milk really low, you're dealing with landowners who have really tight budgets."

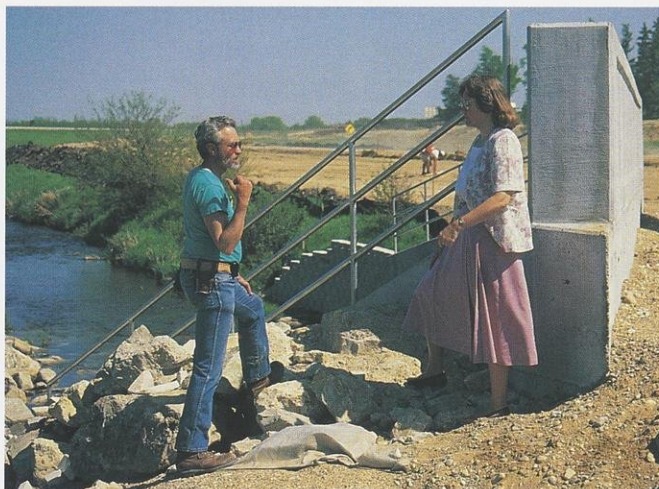
State environmental officials estimate the cost to government and farmers of reducing polluted runoff from farms at more than \$57 million annually if the control measures are implemented over 10 years. In the past, conservation officials say, lawmakers have stepped up and provided adequate funding to help share the cost to farmers who voluntarily installed runoff controls.

Whether lawmakers continue that commitment and whether those dollars will stretch far enough — and be flexible enough — with mandatory runoff controls, remains to be seen.

Urban areas also have standards. The estimated cost to state and local governments, individual landowners and developers range from about \$30 million per year in the early phase of the effort — 2002 through 2007 — to more than \$90 million an-



ROBERT QUEEN



ROBERT QUEEN

(top) Bruce Reisterer (left), Manitowoc County technician, reviews a management plan with a farmer. (above) Road work impacts on a rural creek are minimized with erosion control.

nually in the later years, after 2013. Urban runoff must be controlled whether or not cost-sharing is available.

There has been, and will continue to be, a relatively small pot of state grant money available to urban areas. Even though state and federal government also make low-interest rate loans available to municipalities to manage storm water, it's a far cry from the sum available a generation ago when Wisconsin sought to clean up water pollution caused by old and inadequate public sewage treatment plants.

"The grant picture for the urban side is less robust," says John Pfender, Department of Natural Resources planning analyst. "The state is basically providing seed money. Communities will get some grants to help get the ball rolling to develop and implement municipal storm water management programs, but the state cannot fund the whole thing." Cities can fold these costs into water bills or storm water assessments.

Financing control of rural runoff

Given low prices for milk and other farm commodities, farmers faced with meeting runoff performance standards need three kinds of help: an assessment of the runoff controls they need, technical help in designing those controls, and money to get the measures in the ground.

Counties and the Department of Agriculture, Trade and Consumer Protection provide the first two. The third piece — money to help put in the controls — will heavily rely on the 25-year-old Wisconsin Priority Watershed and Lake Program. That DNR program has annually made about \$12 million available to counties to work with landowners like the Stadlers to voluntarily sign cost-sharing agreements to implement controls. The cost-share money is only available in priority watersheds that have impaired lakes or rivers and a state-approved plan for tackling the water quality problem.

Thirty-five priority watershed projects have been completed and 51 are in progress. As each ongoing project reaches the end of its 10-year contract, state conservation officials hope the money will be available for use elsewhere, Pfender says. All projects will close out by 2009.

In the meantime, farmers also may get state help from DNR's Targeted Runoff Management (TRM) Grants. Counties can use these competitive grants for short-term runoff control projects anywhere in the state — not just in priority watersheds. Some cost-share funding is also available through the state agriculture department's Soil and Water Resources Management Program.

Drawbacks, Pfender says, are limits on control measures eligible for funding. Since the state raises money for TRM grants through bond sales, practices must be bricks and mortar type

Small farms with few cows usually utilize this BMP. A sloped surface allows for controlling disposal of animal wastes in a small feedlot. Solid manure stays put; the liquid flows to the collection area.



improvements — tangible structures such as manure pits and the like — not “soft practices” such as conservation tillage and nutrient management plans, Pfender says.

The situation is better for Priority Watershed and Lake grants. Most of the funding is available as a result of bonding, but there is a small amount of general purpose tax revenues and federal funding which can be used for soft practices.

Concrete pits and other structures are more expensive, require more maintenance, and operate after the soil has started to move, unlike “soft practices,” which tend to be more economical because they keep the soil on the land in the first place. Unfortunately, as conservation agencies are trying to move away from funding structures and focus more on farming practices that slow runoff, taxes available to pay for such practices are shrinking.

Fortunately, the federal Natural Resources Conservation Service expects to receive increased funding for its conservation programs that provide farmers cost-sharing or incentive payments for reducing erosion and runoff.

A trickle of funds for a flood of urban problems

There is some state money available for municipalities, Pfender says, “but the bottom line is we have a tremendous amount of need with a small budget.”

There are two primary sources of state grant funds: the TRM grants and the Urban Nonpoint Source and Storm Water Management grants. A municipality can apply for TRM grants and use them to address urban runoff — but only if the community doesn't have a storm water sewer system regulated as a point source under the storm water discharge program. This funding can only be used to construct BMPs. Under TRM, a community can receive a grant up to \$150,000 for construction projects.

DNR's Urban Nonpoint Grant Source Program is more flexible. Any community that wants to conduct a project in an urban area can apply for a grant, even if the community is regulated under the storm water permit program. A community can receive a grant of up to \$100,000 for planning activities or \$150,000 (plus an extra \$50,000 for land acquisition) for construction projects.

Planning funds help them develop ordinances that will require new development to be designed, built and maintained to minimize and control runoff. User taxes, like storm water surcharges, provide a reliable source of income to install runoff controls.

Generally, storm water utilities charge single-family homes a flat fee while commercial and industrial property owners are charged by the amount of impervious surfaces such as parking lots and rooftop areas.

“It's a good partnership,” Pfender says. “Once a community gets storm water utility in place, it really can cover costs of carrying out storm water management programs.”

Lisa Gaumnitz is a public affairs manager for the DNR Water Program.

ROBERT QUEEN

Rural lessons come to town

How some urban areas are diving in to control polluted runoff.

Natasha Kassulke

A late winter stroll reveals several golf balls peeking out of the upturned soil along Nine Springs Creek. The creek passes through a popular housing development area in Fitchburg south of Madison and adjoins a golf course where youngsters have been known to hide in the woods and take freshly driven golf balls as pranks.

Once littered and overgrown with buckthorn and honeysuckle, this area is seeing new life as a recreational corridor. The woods have been teased back and area water quality here is benefiting from an urban nonpoint source grant.

From a construction access point on Longford Terrace, the project runs along a part of the Capital City Trail. A singing roofer works nearby accompanied by the steady hum of heavy construction equipment.

Visitors pass a detention pond where storm water is collected. When surveying this area, Lois Endres, a City of Fitchburg technician and inspector, says they found owls inhabited the woods. Others reported seeing a red fox and turkeys.

While polluted runoff has historically been considered a rural woe, urban sprawl is now being recognized as a major contributor. Due to high erosion rates and the efficiency of ditches and storm sewers, construction sites "deliver" sediment to lakes and rivers in greater quantities and more quickly than any land use in Wisconsin. For an average construction site, 30 tons of sediment per acre can wash off into nearby waterways.

Construction site erosion control ordinances and practices are designed to help decrease the amount of sediment entering waterways. Many of the lessons for managing polluted runoff from the rural environment also will work in urban areas. Contractors, developers and cities must now join their rural neighbors in planning how to reduce sediment and other pollutants from moving off their land. Construction sites of five acres or more must take steps to maintain 80 percent of sediment on their site that otherwise would erode into lakes and streams. This requirement also applies to road construction projects.

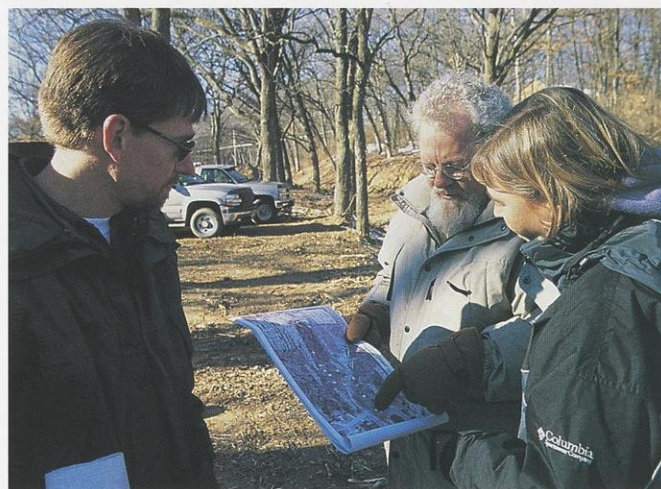
Starting March 2003, these rules also applied to construction sites greater than one acre. Statewide about 250 municipalities will be required to devise plans to reduce storm water pollution from existing development areas by 20 percent by 2008 and by 40 percent by 2013.

"The object is to reduce the amount of pollution that enters storm sewers and winds up in our lakes and rivers," says Eric Rortvedt, DNR storm water program coordinator.

"Cities will take the regulations to the streets when it comes to using street sweeping and installing treatment devices or wet detention ponds," he says. "Storm water is getting more attention and that attention is shifting to the local level."

Mike Rupiper, an environmental engineer with the City of Fitchburg, says the city is working to reduce streambank erosion by protecting the bank, shaving the banks and removing

(below) Designing erosion and storm water management controls starts with an on-site investigation, solid planning, and consultation with appropriate state and local officials and project managers such as (left to right) Mike Rupiper, Bruce Woods and Lois Endres, before any dirt is moved. (bottom) A silt fence is used to settle sediment out from runoff.



ROBERT QUEEN



ROBERT QUEEN



ROBERT QUEEN

Improvements to a stretch of creek in this Fitchburg neighborhood included shaving a bank along with removing exotic species followed by installing vegetation and coconut fiber mats along with large rocks to control soil loss and water degradation. The preferred approach to a BMP involves using natural vegetation, which provides the double benefit of holding soil in place and filtering out excessive nutrients.

exotic species, and installing plants and coconut fiber mats to stabilize the bank and absorb wave action — engineers call this bioengineering.

Nearly half of the Nine Springs Creek project — about 4,000 feet on the trail — is funded through a grant and the rest is financed through storm water utility fees. Rupiper estimates the total Nine Springs Creek project at \$225,000. The nearby Dunn's Marsh streambank stabilization project costs about \$102,000.

"Before we started the project, the area was impenetrable because of heavy vegetation and the streambanks were eroding," recalls Bruce Woods, a project landscape architect for Foth & Van Dyke. "Instead of doing the entire length of the creek, we only did repairs where necessary. Some trees were saved but many were removed to open the canopy and allow some light in."

Trees and brush were removed, chipped and made available

for public use. A "check dam" of small rocks was built about every 500 feet to trap any sediment created by the project. This spring, the area will be seeded with native grasses and sedges. Planting prairie grasses upstream of Dunn's Marsh will help increase infiltration.

Woods says he is getting more work in bioengineering and that keeps the landscape more natural in construction projects. These projects can be more economical in the long run.

Mary Anne Lowndes, a DNR engineer who was actively involved in the polluted runoff rules redesign, calls Fitchburg a "very good example of a municipality taking responsibility for good environmental stewardship."

"People are already asking me when we are going to put the picnic tables in," Endres says.

Natasha Kassulke is the associate editor of Wisconsin Natural Resources magazine.

Making a right turn

From road construction to street sweeping, rules target transportation.

Natasha Kassulke

Alternate side of the street parking can be frustrating for drivers. Yet, it is not just for winter plowing any more — street sweepers need it too.

The results of traffic — bits of tires, brakes, rusty metal and vehicle fluids — cause polluted runoff and need to be swept up just like leaves and grass clippings, explains DNR storm water program coordinator Eric Rortvedt. Less visible are sooty exhaust particles that settle out of the air and are carried to lakes and rivers in rain and snowmelt runoff.

Controlling polluted runoff from cars and trucks goes beyond containing the litter in parking lots and malls. Six-lane highways make the morning and afternoon commutes less congested, but with more pavement comes more runoff. Road construction projects are regulated under either chapter Trans 401 (Construction Site Erosion Control and Storm Water Management Procedures for Department Actions) or chapter NR 216 (Storm Water Discharge Permits) of the Wisconsin Administrative Code.

In 2002, both rules were revised to meet the new standards.

NR 151 contains transportation performance standards for roads, public mass transit systems, highways, public airports, railroads, public trails, and more with some exceptions. The standards target the routes both during and after construction. Wisconsin Department of Transportation's (WisDOT) Trans 401 code applies to projects that WisDOT directs or supervises; the DNR's NR 216 code applies to other transportation construction projects, which are generally smaller private or locally funded projects.

Throughout the process of designing and building transportation routes, the Wisconsin Department of Natural Resources and WisDOT work together to control erosion at waterway crossings and potential impacts to wetlands, fisheries and endangered species.

Previously, erosion controls were required where five or more acres of land were disturbed. This threshold was lowered to one acre on March 10, 2003 to meet federal storm water regulations. These rules even apply to the construction of the state Ice Age Trail and other recreational trail construction where

one or more acres of land are disturbed, explains Rortvedt.

The goal is to reduce sediment carried in runoff by 80 percent. In rural areas, this goal can usually be met by constructing grass swales as a part of the highway drainage system.

Working together, WisDOT, the Department of Natural Resources and others have developed and agreed on how to select proper erosion control practices.

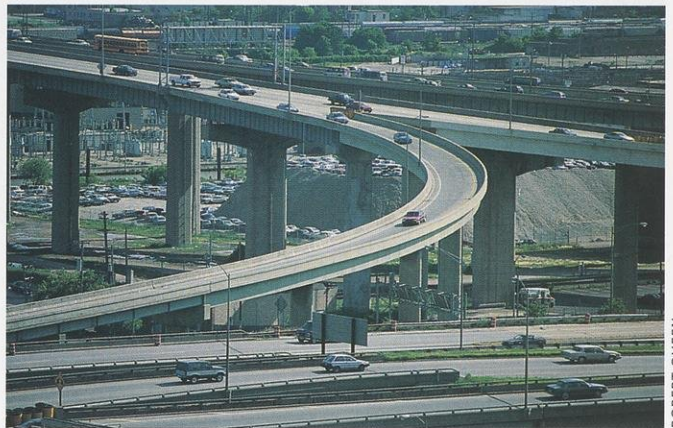
"We've agreed where to seed and mulch," Rortvedt says, "and where to put down an erosion control mat, ditch checks (hay bales and such), riprap and other measures."

"We've streamlined the process," Rortvedt says. "We've made it possible to pick the proper practice based on soil type, slope of the land and slope length."

Additional requirements include the proper use and storage of chemicals, cement and other materials; minimizing sediment discharge from de-watering; sediment cleanup; and protecting sewer inlets.

Kevin Kirsch, an engineer in the DNR Bureau of Watershed Management, recently presented some 60 consultants and municipalities with the new erosion control tools being developed to implement the new rules.

"Everyone was impressed that the tools are working and were even more impressed by the level of cooperation between



City streets and freeways provide their own challenges in managing storm water and the salt, oil, and other nutrients found in rain and snowmelt flowing off of these impervious surfaces.

ROBERT QUEEN

WisDOT and DNR," Kirsch says. "Both organizations came to the table to make the standards work. I would like to point out that WisDOT has stepped up and made valuable contributions. WisDOT staff, particularly John Voorhees (WisDOT District 1 storm water engineer) and Gil Layton (chairperson of WisDOT's Erosion Control and Storm Water Committee) have provided a great deal of assistance and expertise in updating DNR erosion control standards."

At a recent EPA conference in Chicago, it became clear that Wisconsin is at the forefront of erosion control and much of



DEAN TVEDT

Installing new gutters and storm sewers can set the stage to more effectively control and manage storm water.

that can be attributed to WisDOT, Kirsch says.

In developed areas, the rules aim to reduce runoff from cities by 40 percent by the year 2013. This standard applies to both WisDOT and locally operated transportation systems within those areas.

Under the new rules, WisDOT is also responsible for educating its staff and contractors about properly using pesticides, road salts and other de-icing materials as well as maintaining vehicles to prevent pollution. Transportation activities by others are regulated by the Department of Natural Resources. Rortvedt estimates that about 250 Wisconsin municipalities

Leaves should not be placed within the street or curb and gutter area until municipal roadside collection will occur. Leaves placed in a street can end up in storm sewers and local waters where they break down and feed algae. Leaves clogging storm drains can also cause flooding during rainfalls.

need a storm water permit to take steps to reduce the polluted runoff going into their storm sewer systems.

Funding is available to help municipalities pay for improvements in urban areas. However, erosion and storm water control costs for new construction are to be included as a construction cost for land developers and generally is about one to three percent of the overall project cost, Rortvedt says.

The DNR offers grants for local efforts to control polluted runoff. Eligible construction projects include buffer areas, detention ponds and even the purchase of high-efficiency street sweeping equipment.

"DNR and WisDOT are on the same page," Rortvedt says. "During construction the goal is to minimize the amount of land that is disturbed and the time that land is left in an unstable condition."

Natasha Kassulke is the associate editor of the Wisconsin Natural Resources magazine.

Runoff pollution resources

DNR runoff management section

www.dnr.state.wi.us/org/water/wm/nps/index.htm

Find the latest information on the rules and links to related information.

DNR storm water management

www.dnr.state.wi.us/org/water/wm/nps/stormwater.htm

Find the latest information on NR 216 and links to other storm water-related sites.

DNR agricultural runoff

www.dnr.state.wi.us/org/water/wm/nps/animal.htm

Contains detailed information about the agricultural portion of the polluted runoff rules.

Dept. of Agriculture, Trade and Consumer Protection's soil and water resource management program

www.datcp.state.wi.us/arm/regulation/proprules/atcp_50.html

Learn about standards for nutrient management plans and cost-sharing.

UW-Extension water resources program

clean-water.uwex.edu/index.html

Provides a gateway to a variety of information, including information about the Water Action Volunteers (WAV) statewide program that helps local groups and individuals participate in streambank cleanup and storm drain stenciling efforts.

Natural Resources Conservation Service

www.wi.nrcs.usda.gov/news/default.asp

Includes conservation and soil information for nonfarmers as well as agricultural interests.

U.S. Environmental Protection Agency

www.epa.gov/owow/nps/

Includes extensive information about how to manage runoff pollution, including kids' pages. EPA's storm water home page: cfpub.epa.gov/npdes/ also may be of interest.

WisDOT's Product Acceptability List (PAL)

www.dot.wisconsin.gov/business/engrserv/pal.htm

Cites standards for erosion control manufactured products.

— compiled by Virginia Mayo Black

Readers of the Wisconsin Natural Resources magazine:



Thanks for taking the time to learn more about what Wisconsin is doing and what we will be asking you to do to curb polluted runoff. In these pages, you have learned about an important piece of Wisconsin environmental legislation. You have learned about the process, the rules themselves, and where we are headed with implementation.

We'll continue to reduce pollution from industries and municipal waste treatment, but to make headway, these rules focus on the biggest remaining threat to Wisconsin lakes and rivers — polluted runoff from farms, cities, construction sites and roads.

New restrictions on polluted runoff went into effect in October 2002, and these actions to curb such pollution are the most comprehensive in the nation. The rules were developed with the help of numerous advisory groups and through an extensive public participation process that included 34 public hearings in 17 locations around the state. The final rules reflect more than 4,000 verbal and written comments. Meaningful changes in how Wisconsin communities develop can only happen when local concerns are heard and built into the process, and when we look not only at a water body, but at the entire area that drains into it.

Our hope is that these rules will go farther to protect and enhance the quality of our streams, lakes and wetlands. We can do this by improving our lawn care and household waste management, reducing soil erosion during construction, creating more pedestrian friendly neighborhoods, providing open space for recreation, and protecting forests, wetlands and other wildlife habitats.

Our aim is to move ahead to ensure that even more of our lakes, rivers and coastal waters are safe for drinking, fishing, swimming and wildlife. These rules make Wisconsin a front runner in tackling a major threat to water quality. The requirements will be phased in over time. And it will take time for us to gauge the results.

The rules are a step in the right direction. Please join us in keeping Wisconsin ahead of the game.

Thanks again.

Sincerely,

DNR Secretary Scott Hassett

Produced by the Wisconsin Department of Natural Resources

Design: Moonlit Ink

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Wisconsin Department of Natural Resources

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THE WISCONSIN COASTAL MANAGEMENT PROGRAM, part of the Wisconsin Department of Administration, and overseen by the WISCONSIN COASTAL MANAGEMENT COUNCIL, was established in 1978 to preserve, protect and manage the resources of the Lake Michigan and Lake Superior coastline for this and future generations.

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Cover photo by Robert Queen

Adrift on the sea of life

The search to explain declining yellow perch populations in Lake Michigan zeroes in on the fry's ability to survive "the black hole" — those first months drifting around the big water.

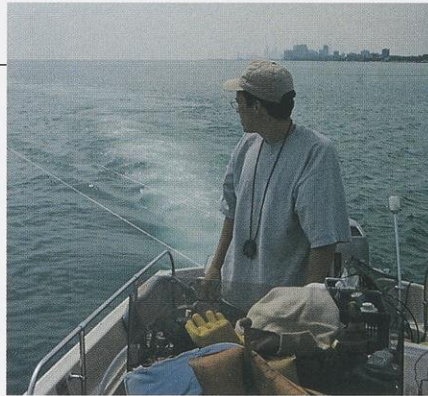
DNR Communication and Education staff

With trawls, fine-mesh nets, diving gear and scalpels, teams of biologists have been sampling yellow perch populations and dissecting why the popular panfish remains in serious decline in Lake Michigan and Green Bay. There are several theories afloat to explain the losses and lots of researchers committed to finding out which ones hold water.

Yellow perch abundance lakewide (including Green Bay) has declined more than 90 percent since the late 1980s, when the population in the bay alone was estimated at 10 million pounds of fish. Today it is less than a tenth of that.

"With the exception of 1998, we have not been able to confirm good natural reproduction of yellow perch since 1991," says Bill Horns, DNR Lake Michigan fisheries biologist, "although we are cautiously optimistic about the 2002 year-class from Green Bay." Commercial yellow perch harvests that in 1989 were limited to 475,000 pounds from Green Bay and 320,000 pounds from Lake Michigan were reduced in stages to zero in Lake Michigan and 20,000 pounds from Green Bay. The commercial harvest ending June 30, 2002 in Green Bay dropped further to 19,000 pounds and since then, only 16,000 pounds of yellow perch have been harvested from Green Bay.

Similarly, sport harvests in Green Bay and Lake Michigan that exceeded four million yellow perch in 1991 (approximately 800,000 pounds), dropped to



Shallow water trawling surveys track the spread, population and development of perch fry during their first vulnerable months.

DNR SO. LAKE MICHIGAN FISHERIES TEAM

242,000 fish in 2002 as populations declined. Daily bag limits were cut from 50 fish to 10 in Green Bay and five in Lake Michigan. Sport fishing for yellow perch will continue to be closed from March 16th through May 19th in Green Bay and from May 1st through June 15th in Lake Michigan to protect mature females throughout the spawning period.

Researchers from states bordering Lake Michigan including state fisheries biologists and university scientists continue to meet regularly as a Yellow Perch Task Group to collectively investigate factors that may contribute to yellow perch decline. They are examining fishing pressure, exotic invasive species, food sources, fish biology, disease and changing lake conditions to pinpoint the most vulnerable portions of the yellow perch's natural life cycle and explain their reproductive failure in Lake Michigan. The Sea Grant program has provided major support for this research. A similar task group is now being formed to develop a research agenda for Green Bay.

Sample often in the first year

Yellow perch live about seven years and reach full sexual maturity in three to four years. In Green Bay, they spawn in April and early May shortly after ice out, when water temperatures range between 44 to 52° F. Spawning starts a bit later in Lake Michigan. In the Great Lakes, yellow perch spawn on sandy, gravelly or rocky bottoms, where 15 to 25 watchful males may closely trail one female. As soon as she releases her rib-bony strand of eggs, the males cloud the waters with a sea of milt to fertilize them. The gelatinous skein of eggs can stretch up to seven feet in length and contains up to 210,000 eggs packed into accordion-like folds. Yellow perch are random spawners, and do not construct nests. The egg masses are protected only by the gelatinous matrix that holds them together. The gelatin is apparently noxious tasting and foraging round gobies will spit out the yellow perch egg masses if they suck them in. The egg masses drift freely across the sandy bottom until they lodge in a rocky crevice or settle to the bottom. The adults neither guard the egg masses nor tend their young, abandoning them after spawning.

Typically, eggs hatch in 8–10 days but may take up to a month before fry emerge. The newborn fry are about a quarter-inch long and absorb nutrients in their yolk sac for several days before they search out zooplankton. The ravenous fry will put on 50 percent of their



ROBERT QUEEN

Yellow perch only live about seven years. Bag limits remain restricted as fish from the last decent year-class of fish (1998) end their prime years as breeding stock that can help the Great Lakes perch populations recover.

first year's growth in three months and grow rapidly for two years. Thereafter they tend to put on weight faster than length. Under ideal conditions, perch fry float about the lake and come back toward shore in mid-summer and early fall to find shelter and food.

Recruitment — the ability of young fish to survive that first year and eventually join the breeding population — has been paltry for more than 15 years, Horns says. "We only saw promising year-classes of yellow perch in Lake Michigan during 1995 and 1998; in Green Bay during 1998 and, perhaps 2002. In fact, our creel survey work shows that in both Green Bay and Lake Michigan, more than 90 percent of the yellow perch that anglers are catching now are from that 1998 year class." Those five-year-old fish are now the prime contributors to the breeding population. Hopes for the future hinge on their breeding success last year through next year.

Tracking early growth

To track the reproductive success of each year-class, DNR dive teams have examined traditional yellow perch

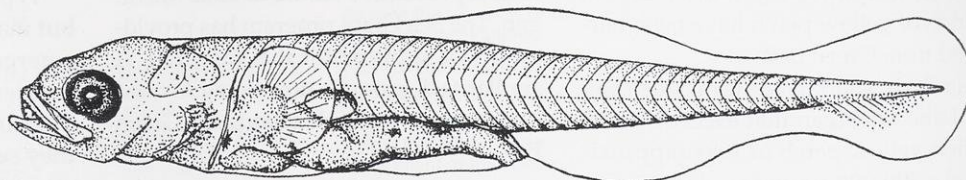
The accordion-like egg masses can each hold more than 200,000 eggs and fish find them unpalatable. Yet too few yellow perch fry (bottom) are surviving their first months adrift and their first winter.



JOHN JANSSEN

breeding grounds on the bottom of Lake Michigan each spring since 1997 to count the number of drifting egg masses. Underwater surveys last June indicated yellow perch are laying eggs in good numbers compared to recent years. Divers found 11.5 egg masses per 1,000 square-meters of surveyed lake-bed. "That's a fairly big increase in the number of egg masses compared to some of the earlier years," says Brad Eggold, DNR supervisor of the southern Lake Michigan fisheries. "Those eggs probably hatched as they always have."

Most yellow perch appear to perish between the time they hatch and the time they return



GREAT LAKES WATER INSTITUTE



DNR SO. LAKE MICHIGAN FISHERIES TEAM

Fisheries researchers trawl for perch fry in summer, mark fish and track their growth to estimate current populations and future trends.



Most fish are measured, tagged and released. A few adult fish are also necropsied to look for signs of disease or abnormalities in reproductive organs that might explain population declines.

to their near-shore spawning grounds to overwinter. "That time between hatching and coming back to near-shore water to survive the first winter — that seems to be doing the perch in," says

Eggold. "That's the black hole."

"We just don't know a lot about what happens to these perch during this extremely vulnerable period," says Bill Horns. "Ideally those fish would

find refuge in areas where there is vegetative cover, food and rocky protective cover, but that might not be the case. Some of our current research aims to fill that information void."

John Janssen, a senior scientist at the UW-Milwaukee Great Lakes WATER Institute, believes wind and water currents on Lake Michigan may be blowing newly hatched yellow perch across southern Lake Michigan to locations where they have limited food supplies.

In mid-summer last year, Janssen and DNR crews towed large fine-mesh nets behind boats to catch yellow perch fry less than half an inch long. Due to steady winds, only 10 days after hatching, the perch fry were most abundant about 10 miles offshore; a few days later, large numbers were found as far as 25 miles offshore. "Less than

two weeks after hatching we were netting good numbers of yellow perch fry a third of the way to Michigan," Janssen says. "The young fish find themselves far from home in an environment that may have little food."

The east side of Lake Michigan tends to have a soft bottom where the microscopic plants called phytoplankton can settle out. Those microscopic plants, mainly diatoms, are the primary food source of the burrowing amphipod, which in turn is the primary food

source for young yellow perch. But zebra mussels also prey on phytoplankton, and large populations of this invasive mollusk can consume a considerable quantity of available food. The zebra mussels may also filter the water, increasing the clarity so other fish can more easily see and prey upon young yellow perch.

"If those young perch get blown into a 'food desert' they've got serious problems," Janssen says. It's probable that young yellow perch swim up to the surface after hatching, get caught in the currents and, after 40–50 days, wash ashore into rockier shores that provide food and refuge. But if the weather is rough and steady winds prevail, the fry can get into real trouble, really fast. First, they can't readily find their way back home. Second, they become prime target prey for other fish. Substantial numbers may never survive to make it home.

Researchers are exploring other avenues that might explain why so many fish aren't surviving long enough to enter the breeding population. Crews in June capture yellow perch during the spawning season to measure the length, weight, overall condition and sex ratio of the perch population. The fish are also tagged and released so the population can be estimated later in recapture studies. The male-to-female ratio was roughly 9:1 in the most recent sample. A little more surprising, by June only 55 percent of the females had spawned, 34 percent were not yet ready to spawn, and 11 percent were considered "ripe" but had not yet spawned. The percentage of females in these spawning surveys has been so variable that it's difficult to assess whether the results indicate a change in the population.

In August and September, fisheries crews use beach seines and bottom trawl nets to sample the abundance and health of fish born earlier in the summer. The abundance of these young-of-the-year perch in early fall has been a fairly reliable predictor of yellow perch population strength in subsequent years. Because young yellow perch tend to swim in closer to shore during the day, the standard sampling method is to

walk a long beach seine with quarter-inch mesh straight out from shore. The four-foot-high net is weighted on the bottom and has floats on top to keep it perpendicular to the water. While the on-shore end of the net is held steady, the other end is walked in a sweeping arc toward the shore. Two pulls are taken at each site, and 14 sites are sampled along the coast between Kenosha and Sheboygan. Sampling via these long nets is considered an important companion to sampling with trawling nets drawn behind boats in deeper water.

There is a glimmer of hope in last year's results. For nine years, yellow perch were so scattered that seining averaged well less than one perch per pull of the net. Last year the average was 1.3

yellow perch per pull — the strongest results since the 1998 samples when 3.02 fish were captured per sample. Fish from this year-class that survive through the winter will enter the breeding population in 2004 at the earliest.

Those same results were reflected in winter sampling, when gill nets of one to three-inch mesh were placed offshore of Green Can Reef at Milwaukee, one of the best spawning grounds for yellow perch. Because yellow perch do not segregate by size or sex at this time of year, it's one of the most effective times for DNR crews to sample the whole population. This winter assessment is used to estimate the size, age composition and sex ratio of the yellow perch population. Results showed that the 1998 year-class continues to dominate the popula-

Activities to monitor the Great Lakes yellow perch population include sending down divers to count egg masses at spring spawning grounds and seining young-of-the-year fish in August and September.



TIM KROEFF



BRAD EGGOULD

tion as it has for the last several years. It confirms that no other strong year-classes are present to help the Lake Michigan yellow perch population rebound.

Other research teams tested yellow perch blood and hormone levels and examined the sex organs of male and female yellow perch to look for developmental changes that might indicate genetic changes, which could explain the precipitous drops in perch populations. No significant differences between yellow perch from inland lakes and the Great Lakes were noted.

Yellow perch ovaries and testes develop over the summer, fall and winter in advance of the spring spawning season. Hormone and protein levels in the blood are important indicators that the fish are healthy and capable of reproducing. Tests from the winter of 1996 through spring 1997 did not indicate reproductive problems, though it appears the sexual maturity of Lake Michigan yellow perch lags slightly behind fish sampled from inland lakes. The Lake Michigan fish are simply ready to spawn a little later in the season than their inland lake counterparts. Other microscopic differences in the body structures of inland lake and Great Lakes perch are being examined.

Alewives snacking on perch?

Other Great Lakes studies have shown that adult alewives will prey on yellow perch larvae, but no studies have quantified that possibility on Lake Michigan. Back in 1997, alewives were netted for six nights on Lake Michigan for 30 minutes after sundown. The fish were measured and preserved, and the stomach contents from 340 fish were analyzed. No larval perch were found and tests showed that 95 percent of the alewives' diet consists of copepods, a large group of freshwater crustaceans.

Similar results around the lake

Surveys by other states lakewide indicate similar weak yellow perch populations and poor young-of-the-year survival since 1989. Wisconsin, Michigan and Indiana studies estimate the popu-



JUSTINE HASZ

Surveys on Green Bay look for similarities and differences in the perch populations on the bay and Lake Michigan. Dealing with white perch, cormorants and shallow waters may require different strategies to recover yellow perch populations in the bay.

lation drop-off at 90–95 percent, while Illinois studies show an 86 percent drop in the waters off their portions of the Lake Michigan coastline.

Though the trends in Green Bay are similar to Lake Michigan, differences in the physical and biological environment mean that somewhat different fac-

tors may be at play in that warmer, shallower, more sheltered environment. A series of public workshops in 2002 led to the formation of a new Green Bay Fisheries Research Group, which will develop a research agenda to examine unique conditions in Green Bay. The roles of white perch and cormorants will be of interest to that group, along with the many factors already discussed regarding Lake Michigan.

Agencies around the lake are reaching ever wider to find strategies to help sagging yellow perch populations recover. Worldwide perch experts will convene in Madison for the first time in eight years on July 20–24, 2003 at the Third International Percid Fish Symposium. Experts will provide updates on perch management and breakthroughs in percid aquaculture. Special sessions will examine the status of yellow perch in the Great Lakes, in the hope that sharing results will lead to further strategies and options for bringing back robust populations of this Midwestern staple of fishing, fun and fine eating. ▀

Commercial fishers, sport anglers and fisheries biologists shared research results at summer workshops in Green Bay and developed recommendations.



JUSTINE HASZ

First call for cleanup

For a quarter-century, a simple spill reporting law has helped communities, businesses and governments stanch everything from trickles of pickle juice to floods of fuel oil.

Robin Schmidt and Andrew Savagian

The Hazardous Substance Spills Law created few ripples when it was signed 25 years ago this May, but it has since created waves of change for Wisconsin's cities, towns and villages.

The law is simple: Under State Statute 292, anyone possessing or controlling a hazardous substance is required to immediately notify the Department of Natural Resources if such items are spilled on the ground, in the water or released into the air. Second, the environment must be restored to the extent practicable.

Whether a spill consists of everyday substances like fuel oil and gasoline, or toxic tongue twisters like perchloroethylene (used for dry cleaning clothes), the straightforward reporting requirement has given communities and state agencies the vital information needed to deal promptly with hazardous situa-

tions. Communities want to prepare for potential accidents, handle hazardous spills safely and efficiently, and restore the environment.

A call for spill prevention

DNR was in the thick of spill prevention and cleanup battles even before there was a law on the books. "The 1974 train derailment in Walworth County — where tons of phenol contaminated the groundwater for years — really made the department assess its ability to be prepared for spills," said Perry Manor, a former DNR spills coordinator and one of the agency's first responders to that incident. Back in '74, the Department of Natural Resources had limited ability to access private property to contain spills, little authority to require cleanups of leaking tanks, little control if materials spilled in transit, and no requirements to be notified when spills

occurred. "We needed more to help protect public health and the health of the state's natural resources," Manor said.

It took four years to develop a program and craft the legislation. After the law was enacted, the Department of Natural Resources and other response agencies quickly went to work. Manor and others were named to a Hazardous Materials Task Force, a state group charged with determining the frequency, location and magnitude of spills, and assessing how vulnerable Wisconsin was to such incidents.

According to David Woodbury, DNR emergency management officer, efforts in the Badger State to provide community protection mirrored what was going on nationally. The nation needed to coordinate local, state and federal efforts to ensure community safety when hazardous emergencies and natural disasters occurred.

A spectacular tire fire in Somerset in October 1986 required the combined talents of firefighters, public health officials and DNR spill/environmental teams to quell the blazes. The fire emphasized the importance of coordinated spill response and led to a statewide tire recycling program that met its goals and ended.

Worldwide awakening to hazardous disasters

In the late 1970s, the country was reeling from the Three Mile Island nuclear accident in Pennsylvania, and the revelations from Love Canal, the small neighborhood in Niagara Falls, New York that became heavily contaminated from decades of chemical dumping. Then came the huge toxic air spill at a Union Carbide plant in Bhopal, India in 1984.

George Meyer, former DNR Secretary and visiting professor of environmental studies at Lawrence University, remembers that time well. Meyer was working as a DNR attorney in the 1970s and said the agency was reacting, along with the rest of the country, to a new sense of community responsibility to protect the public and the environment from toxic releases.

"With many of the sites, like Love Canal, we knew the nation would have to go back and correct those problems," said Meyer. "But we also had to prevent those problems from ever occurring again. We had to learn from our mistakes, that the sooner you start dealing with problems like hazardous spills, then you can minimize and prevent the serious long-term pollution problems we're still dealing with at many sites today."

As a consequence of national and worldwide hazardous emergencies, a series of federal programs in the late 1970s and 80s addressed toxic dumping, chemical emergencies and hazardous waste management. They included the Resource Conservation and Recovery Act that defined hazardous wastes, the federal Superfund program for cleaning up toxic waste sites, and the Emergency Planning and Community Right to Know Act (EPCRA). That last law, EPCRA was particularly important to communities because it empowered them to do their own emergency planning. Certain industries were required to keep inventories of the extremely hazardous substances that they made, stored, released or transported. Those inventories were made available to the public through a data base called the Toxic Release Inventory (TRI) and were made available to local

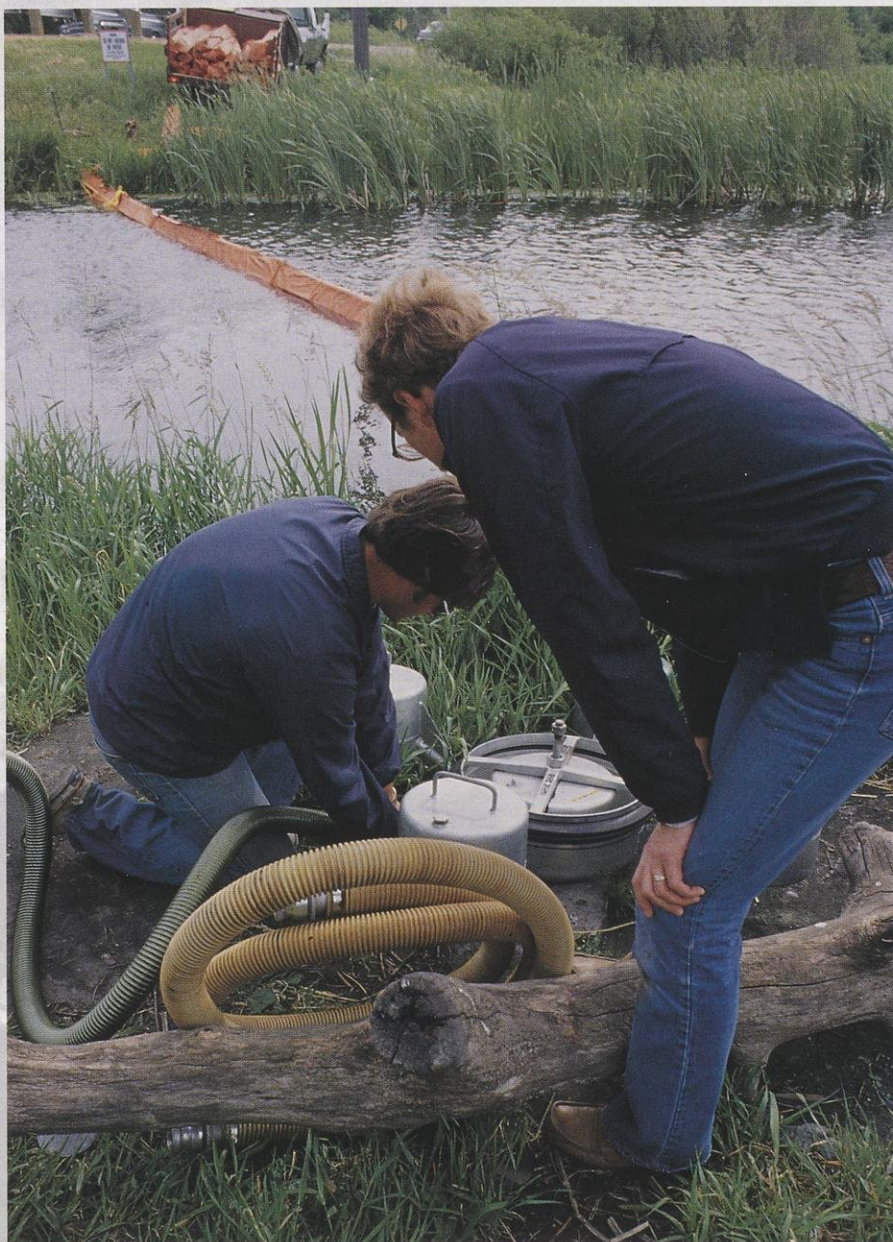
fire departments, hospitals and community managers to plan emergency response.

A need for quick, local response

State efforts complemented the federal programs. For example, the Department of Natural Resources tried to provide statewide spill response by having spill trailers located throughout the state. It became clear that scattered teams and equipment could not adequately re-

spond to statewide emergencies. In 1991, the state legislature passed the Regional Hazardous Materials Response Team program that built a network of trained local fire departments that could respond to hazardous emergencies in each community. Regional or "Level A" teams would respond to the most serious spills and chemical releases that required the highest level of protective gear and training. County or "Level B" teams were trained to safely handle emergencies that were less life-threaten-

In the early days of the spill program, DNR staff trained to respond to oil spills. Here, floating booms were placed across a creek at a simulated spill. Floating oil skimmers behind the booms would pump collected oil into nearby tankers. Emergency response was subsequently delegated to regional hazardous materials teams and private contractors.



JIM ESCALANTE

ing to responders.

Tim Franz, chief of the Oshkosh Fire Department, is well-versed in the system. Franz's department recently joined with the Appleton Fire Department to form the Northeast Regional Hazmat Team, providing Level A coverage for the largest geographic area statewide.

"When part of the City of Oshkosh was evacuated due to a chemical release from a rail car last year, the Oshkosh Hazmat Team led the response, Franz said. "When the releases are contained, we work with the DNR spill coordinators who ensure the proper cleanup actions are taken by the responsible parties," Franz said. "The fact that we have the experience and training to respond means we can better serve and protect the people living here. We know following the September 11th tragedy that local fire departments play critical roles in all types of disasters from terrorism to train derailments. Through the regional response team program in Wis-

consin, local fire departments get training and equipment to respond to whatever releases we can anticipate."

Franz's experiences illustrate how the Spills Law continues to stand as work in progress for sound environmental legislation. Woodbury, who worked for the Division of Emergency Government on spills as the law developed sees many of the original recommendations still in place today.

"When a spill is called in to our toll-free hot line, our duty officer is immediately informed and can ensure that the appropriate state and local resources are directed towards that spill," he said.

Along with the hot line, the Department of Natural Resources now has spill coordinators in each of five state regions. Through the one-call system, multiple state and local agencies — including local firefighters and hazardous materials teams — spring into action and work together to solve any spill emergency that comes along.

A tool for prevention and cleanup

Supporters of the Spills Law eventually realized this mild-mannered piece of legislation had far-reaching effects.

"Certainly the original purpose was more limited, but this law blossomed to become one of the major cleanup tools for the state, to use for all spills," said Meyer. The former DNR secretary feels that, due to the limited bureaucratic strings attached to the law, it allowed flexibility in creating guidelines and policies, helping expand cleanup efforts as the years went by. The Spills Law equally serves as the basis for a lot of state cleanup programs now working to restore lands and waters that may have been polluted 10, 50 or even 100 years ago.

"[The law] became a tool to help us deal in areas where we had similar types of problems; in other words, once we had the data, we would know where there were X number of spills in a particular industry or area," Meyer recalls. "State agencies and industries could then monitor what was happening with the use of hazardous/toxic substances."

Mark Giesfeldt, bureau director for DNR's Remediation and Redevelop-

ment Program, which oversees cleanups for a number of contaminated sites, agrees. "The Spills Law — with its emphasis on controlling any release of hazardous substances — has allowed the Department of Natural Resources to expand its efforts and work cooperatively with communities on long-term cleanups and pollution prevention."

Giesfeldt, who has been with the department since the 1980s, has seen the law's positive effects firsthand. "From a handful of staff that provided spill response and cleanup advice, to a statewide program working together with local officials and private parties cleaning up thousands of contaminated sites across the state, the Spills Law has made a tremendous difference," said Giesfeldt.

The life of a DNR spill coordinator

Roxanne Chronert considers her job one of the best the agency has to offer. "Each day when I come to work, I never know what I'm going to be dealing with," she says.

On a typical day, Chronert will get calls about various spills, often small spills such as diesel tank leaks that occur when there is a traffic accident. "If it's a trucking firm that I know has responded well in the past, and they have a contractor on site and are working with the local responders, I don't need to oversee them," she says. Chronert then can spend her time working on other spill matters. She routinely meets with local fire departments and other response agencies, including DNR wardens, to discuss various spill response issues. "I like getting to know them and having them get to know me," she explained. "Then when an emergency arises, we know exactly what to expect from each other and can focus on managing the emergency. This is what leads to successful responses that keep the citizens and communities well protected."

On October 17, 2002 Chronert was working with representatives of the Department of Health and Family Services, as well as with Andy Carlin, the Waupaca County emergency management director, to assess conditions at a

Tim Franz leads the Oshkosh Hazmat Team covering the largest region of Wisconsin. Local firefighters, police, environmental and health professionals team up and train together to provide quick response.



OSHKOSH FIRE DEPARTMENT



Spills hydrogeologist Roxanne Chronert on site at the Weyauwega train derailment.

recently busted illegal methamphetamine lab. "The site was pretty messy," she recalled. While carrying a bucket of waste oil to a nearby building to secure it, she stepped over a piece of particle board laying on the ground. "I cautioned Andy not to trip on the board," she said. Then she heard the sound of the board buckling and saw him fall into a 14-foot dry well. "He was barely able to hold himself up at the edge of the well — I just grabbed him by his



WISCONSIN CENTRAL DIV., CN RAILROAD

(top) When fire erupted and 9,000 gallons of sodium hydroxide spilled from a derailed train in March 1996, the town of Weyauwega was evacuated for 17 days. The emergency warranted unified response by fire, health, environmental, railroad and community officials.

(above) An aerial view of the derailment site.

shirt and pants and lifted him out."

March 4, 1996 was also not a typical day for Chronert. At 5:55 a.m. a Wisconsin Central train derailed 35 cars on the edge of Weyauwega, a small town of 1,700 in northeast Wisconsin. Fourteen cars contained pressurized liquid gas (propane and LPG). Several gas tank cars ruptured and ignited. Nine thousand gallons of sodium hydroxide were

released from two other cars. Because the derailment was close to town and there were potential fire and explosion hazards, the entire town was evacuated — for what most thought would be a brief time.

"The fact that everyone, including the railroad employees, had been trained in the Unified Command System of communication made managing this emer-

gency much more efficient," says Chronert. She and the wardens worked 12-hour shifts. They were present for the 8 a.m. Unified Command briefing and stayed until the 8 p.m. command briefing. "Conditions in the gas tanker cars could have led to a major explosion, igniting the remaining tanker cars and potentially destroying portions of the town," recalls Chronert. Railroad officials hired national experts to find a way to relieve the pressure from the heated gas cars and reduce the likelihood of an explosion.

The railroad was also responsible for restoring the environment to pre-d derailment conditions. Fortunately, the derailment did minimal environmental damage. Residents were kept from their homes for 17 days until electricity and gas lines could be restored. "If you ever need to evacuate your home, take your pets, prescriptions, purse, billfold and keys with you," advises Chronert. "No one expected to be without their wallets for 17 days!"

Not your normal spills

When you think of spills, you probably have in mind a semi with a gaping hole in it, or a tanker on its side. But some spills cause significant environmental problems because of the nature of the spill, where the material was spilled, or the toxicity of the substance spilled.

Knee high by the Fourth of July: It's hard to think of corn — as in sweet corn, popcorn or feed corn — as a hazardous substance, but it all depends on the situation. Consider a stream filled with dried shell corn from a derailed train.

As organic materials decompose in water, they increase the biological oxygen demand (BOD) of the water — which reduces the amount of oxygen available to the organisms living in the water, including fish. If the BOD gets too high, the water will not contain sufficient oxygen for organisms to survive. Any organic material — corn, milk, manure — can be hazardous if too much is released into a stream, pond or lake. The company associated with this spill did not report it to the DNR, and was subject to enforcement action.

If there's corn, there must be butter: In May of 1991, a fire broke out in a refrigerated warehouse storing 50 million pounds of food products, including butter, lard and cheese. This warehouse was near a creek that flowed into Lake Monona, a large urban lake in Madison. Heat from the fire caused the food to melt, which contributed to the intensity and duration of the fire. The warehouse buildings were destroyed, and water from suppressing fires mixed with the

melted foods and flowed toward the creek and nearby storm sewers — all leading to the lake. The fire department realized quickly that this spill was a potential environmental disaster and reported the release to the Department of Natural Resources. The department acted to prevent the mixture from reaching the water, and the total environmental cleanup costs to the warehouse company were over \$1 million. It took eight days to put out the fire.

Each region has unique opportunities to prepare to respond to unusual spills.

(below) Ted Amman, a DNR spill coordinator, wades a stream where a derailed train car dumped dried corn. As corn decomposed, it reduced oxygen in the stream for aquatic life.

(bottom) Melting butter and cheese from a warehouse fire threatened to reach a nearby lake in Madison.

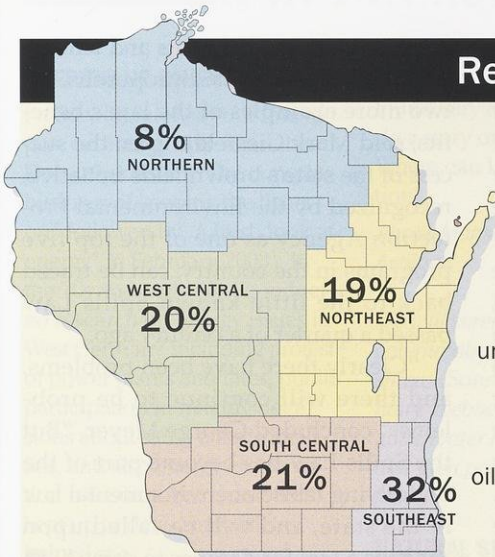


DNR PHOTO

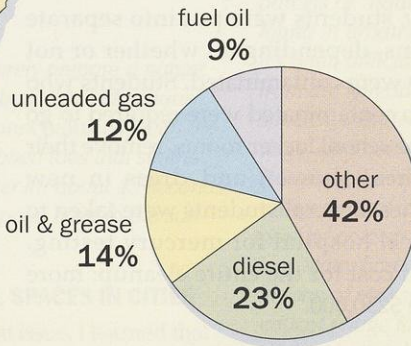


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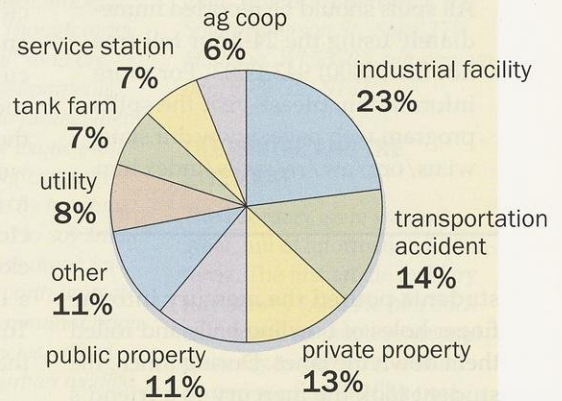
Reported spills in Wisconsin



What is spilled



Where spills occur



Approximately 800 spills are reported annually in the state. The majority of these occur where the population is the greatest. DNR's Southeast Region is the smallest in size but the largest in population in the state, and nearly a third of all spills in Wisconsin occur there.

Most spills in Wisconsin are small. While quantity can be important, the substance spilled and where it is spilled are generally more critical factors. The most commonly spilled

substances are petroleum products, with diesel fuel topping the list at 23 percent. Other substances such as fertilizer, paint and ammonia make up over 40 percent of the state's total spills.

Many accidental spills of hazardous substances happen at industrial facilities, including paper mills and chemical plants. Transportation accidents are another common source, as fuels are loaded and unloaded.

MAP AND CHARTS BY MOONLIT INK

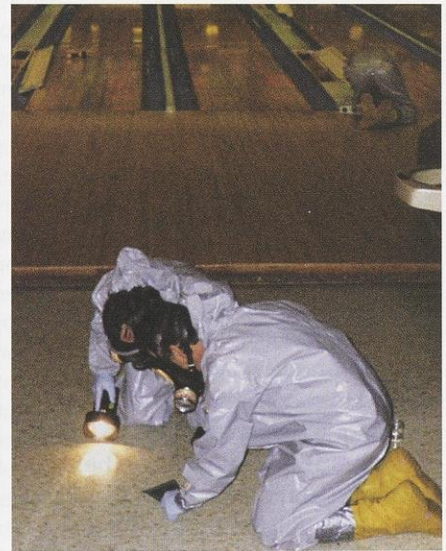
What's that smell? Manure is not often thought of as a hazardous substance — it's a natural by-product of animal husbandry — but it needs to be properly managed or hazardous conditions may result. Manure applied too heavily on farm fields can run off into surface waters when it rains, or may be flushed into streams when barnyards are cleaned. The decomposing organic material removes the oxygen from the water, resulting in fish kills stretching for miles downstream.

In a pickle: A truck driver was in quite a pickle after his truck carrying pickle juice was in a major collision. Pickle juice and diesel fuel leaking from the truck caused soil contamination due to the hazardous characteristics of the fuel and the low pH of the pickle juice. The trucking company hired a cleanup company to excavate the contaminated soil and properly dispose of it. If left in place, the contaminants could have migrated to groundwater, affecting nearby private drinking water wells.

"F" in science class: Recently, a high school science teacher brought mercury



School kids having "fun" with four ounces of mercury contaminated each other and the school locker room.



Cleanup of the school, bus and a bowling alley cost more than \$250,000.

EMERY COONEN, ONYX SPECIAL SERVICES

to his science class for lessons. Despite warnings about the hazards of handling mercury, the silvery substance was simply too tempting for one student, who stole the small bottle containing approximately four ounces of the element.

The student and friends began play-

ing with the mercury, spreading it to various classrooms, stairwells, steps and sidewalks. Later in the morning, the student took a bus to a nearby bowling alley. The container of mercury was passed around, dripping on more students and the bus. At the bowling alley,

How do I report a spill?

All spills should be reported immediately using the 24-hour toll-free hot line, (800) 943-0003. For more information, please visit the spills program web page: www.dnr.state.wi.us/org/aw/rr/spills/index.htm

students poured the mercury into the finger holes of bowling balls and rolled them down the lanes. During lunch, the student took the mercury to a friend's house, transferring it to Ziploc bags to be sold for \$1 per bag. Before classes ended that day, the student was called out of her classroom, the mercury was confiscated and police, fire departments, and the Department of Natural Resources were notified.

The high school, several students, one home, a school bus, the bowling alley, and a sidewalk tested positive for mercury contamination. A contractor was called in to assist with the mercury cleanup. To gain control of the scene and to control the spread of the mercury, students were put into separate rooms, depending on whether or not they were contaminated. Students who were contaminated were required to go to the school locker rooms, remove their clothes, shower, and dress in new clothes. Several students were taken to a local hospital for mercury testing. Total cost for the entire cleanup: more than \$250,000.

Long-lasting benefits

The long-term effects of the Spills Law will continue to help communities and state agencies better prepare for hazardous spills. The state's voluntary cleanup process and incentives to en-

courage local governments and lenders to restore contaminated properties, are two more examples of the law's benefits, said Mark Giesfeldt. Even the success of the state's brownfields initiative, recognized by the Environmental Protection Agency as one of the top five programs in the country, can be traced back to the little known Spills Law passed a quarter of a century ago.

"Clearly there have been problems, and there will continue to be problems," concluded George Meyer. "But the Spills Law has become part of the underlying fabric of environmental law in the state, and will be called upon again as a tool for decades to come." ■

Robin Schmidt is DNR's hazardous substance spills team leader and Andrew Savagian is a DNR outreach specialist on waste management issues. Both work in Madison.

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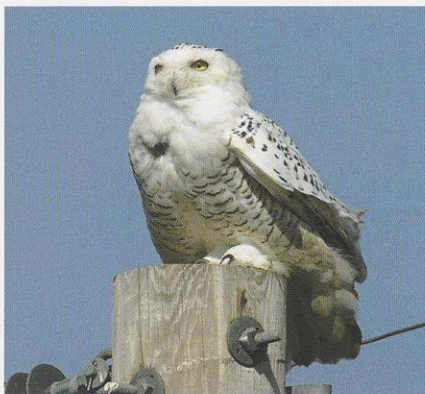
Finally in mid-September, confident that the owl was going to stay, Alice Droske called Charles Kemper, President of the Chippewa Wildlife Society.

He was skeptical at first. "It's extraordinary to see one this time of year," Kemper said, but he took Alice Droske up on her offer to show him. Sure enough, they found it, perched on a truck trailer parked behind a shop on Highway 12.

No one is certain when the bird arrived, where she came from or why she decided to stay.

It's not unusual to see these "ghosts of the tundra" in Wisconsin between November and March when they range south looking for food, but it is extremely unusual for a snowy to summer in the lower 48 states. Snowy owls have only been recorded in Wisconsin nine times during the past 50 years during summer, said Bob Domagalski of Menomonee Falls, who keeps bird records for the Wisconsin Society for Ornithology (WSO). Only one bird, spotted on August 17, 1963, "likely stayed the entire summer," he said.

Why this particular owl stayed in



This snowy owl spent a full summer in Eau Claire. We usually only see them occasionally in winter.

Eau Claire is the subject of conjecture.

"She was probably ill or injured earlier in the year, and for whatever reason didn't make it back north," said Janine Polk, a WSO member who lives in Eau Claire.

The bird's age could also be a factor, according to Paul Kerlinger, author of *How Birds Migrate*. "A number of species fly south and don't fly back north until they are two years old and capable (or almost capable) of nesting," he said. "Not having to migrate back and forth

two more times may reduce the risk to a bird, especially if lots of food is available."

Despite an earlier unconfirmed report that two snowy owls had been spotted in the same neighborhood, experts say it was probably not a breeding pair. Snowy owls are not likely to breed or nest in Wisconsin, said Paul Johnsgard, author of *North American Owls: Biology and Natural History*. Their breeding behavior is triggered by changes in day length. In the Arctic, that peaks with 24 hours of continuous sunshine in June and July. In Wisconsin, we get a maximum of 15 hours, 23 minutes of sunlight on the June solstice, and this photoperiod makes it unlikely that snowy owls would be triggered into breeding behavior.

"The bottom line is that we just don't know why they stayed so far south," said Kerlinger. "Maybe that's why some of us go into biology — to solve some of the little mysteries." ■

Heide Hughes writes from Nelson.

KEEPING UP ON ENERGY

I read with interest your fine report on energy options in the December issue ("The complex business of keeping the lights on," followed by "A fresh look at energy" in February 2003). In the 70s and early 80s I conducted research on energy issues in West Germany, including protest of power plants and lines, public participation in making decisions about siting energy facilities, and also energy conservation measures. But I have not kept up to date. Your articles helped me.

Given the issues current and emerging in Wisconsin and neighboring states about siting energy plants, and the production and consumption of electricity, your articles were certainly important ones.

Prof. Luther P. Gerlach
Blaine, Minn.

RUNNING ON THE MARSH

This fall I was in a muskrat swamp waiting on ducks. I was near a muskrat house when I saw one of Wisconsin's most unique mammals, a water shrew. It would dive down into the water and pop back up to the surface just like a cork, then run on top of the water like a water skipper.

I looked it up in books and found very little. Did you ever do a story on the water shrew? Where can I find any information?

James Mattson
Ashland

We will surely prepare a nature column about this industrious shrew (Sorex palustris) with the hairy, webbed toes that swims underwater for about 45 seconds and then pops back to the surface.

NATURAL SPACES IN CITIES

In a recent issue, I learned that the State Natural Areas purchase remnant natural areas to protect them, but most of these areas are larger tracts of rural land. Is there an agency or program that would be interested in saving much smaller areas within cities or suburbs? There is an area of land for sale for development in my community that is a beautiful wooded home to many animals. There could be important species of birds, salamanders and other small creatures that could be saved and provided for.

Susan Dragieff
Oak Creek

We posed your question to Thomas A. Meyer, who heads our program to preserve State Natural Areas involving private properties. Here is his advice:

It's true that the State Natural

Areas Program focuses on larger tracts of Wisconsin's native landscape containing the plants, animals, and natural processes that are indicative of pre-European settlement times. Though many parcels of "natural" land are found in urban environments, it's often difficult to protect them from the spread of exotic plant species, wandering cats and dogs, and overuse by humans. However, that's not to say small urban natural areas aren't important or aren't worth protecting. Many harbor remnant populations of rare species, afford critical refuge for urban wildlife and migrating birds, and provide important green space for communities.

Today's cash-strapped communities are often unable to purchase new parkland, especially if the land doesn't provide opportunities for multiple recreational uses such as soccer fields and playgrounds. It may be worth a try to work through the local community bureaucracy: alderperson, parks department, etc.

The best course, though, might be to enlist the help of a land trust. Land trusts are non-profit organizations that protect land; usually in a defined geographic area, and typically for a specific purpose (preserving farmland, protecting natural areas). The land trust movement has exploded in Wisconsin in the past few years. There are now nearly 70 different private organizations devoted to buying and protecting land in our state.

Some — like The Nature Conservancy — work statewide, others — like the Ozaukee Washington Land Trust — focus on protection in a small area such as a county or watershed. The Gathering Waters Conservancy is an umbrella organization that provides support to Wisconsin's land trusts. Its website, www.gatheringwaters.org, has contact information for all land trusts operating here. A few of the trusts working in the Milwaukee area include the Milwaukee Area Land Conservancy, Friends

of Milwaukee's Rivers, and the Urban Open Space Foundation. To find other groups with interests in Oak Creek, contact Gathering Waters Conservancy, 211 South Patterson St., Suite 270, Madison, WI 53703, phone number (608) 251-9131.

THE WRITER AND THE RIVER RAT

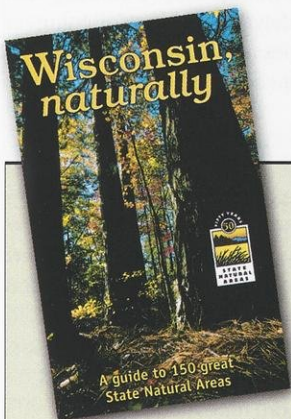
The February issue was just great, full of information and interest. The first article by Mary Kay Salwey (*And the plot thickens*) made so much sense and was easy to perceive. When I started reading the fifth paragraph about her husband and their acreage in Buffalo County, the light didn't go on, but when I turned the page, there he was, "The Last River Rat" in his domain. What a great little book it is (*The Last River Rat* by J. Scott Bestul and Kenny Salwey, profiled in our February 2002 piece "Off the rack")... What if Mary Kay wrote articles about their wealth of knowledge of Wisconsin's resources, once in a while anyway?

James C. LaPinske
Neshkoro

We agree. As DNR's State Wildlife Educator, Ms. Salwey writes, draws, teaches and works with a team of DNR wildlife educators and interpreters to help the public appreciate wildlife and foster more wildlife habitat throughout Wisconsin. Mr. Salwey is a seasoned outdoorsman, trapper and now an educator. Another story by Ms. Salwey is in the works for late fall.

RABBITS AND DOGS

I enjoyed the February story "Adolescents, beagles and cottontails," and got this information about a group Rabbits Unlimited that formed in South Carolina to encourage local chapters of hunters who care about both "beagling" and hunting. (P.O. Box 186, Abbeville, SC 29620). Maybe it will spark an



TRAVEL TO A NATURAL PLACE

"Wisconsin, naturally," DNR's guide to 150 of the State Natural Areas is in stock and ready to mail. This 184-page, spiral-bound guidebook for hikers, birders and nature-lovers contains maps, driving

directions, and descriptions to the sites we feature on our back cover. It's available through the DNR's Bureau of Endangered Resources for \$10 (tax included) plus \$3 shipping. Call (608)266-7012 or print an order form online at www.dnr.state.wi.us/org/land/er/sna.

interest in other rabbit hunters to start local chapters. I think they have a good idea.

Jim Fonville
Marietta, Ga.

You can surely find groups close to home as well. Several Wisconsin beagle clubs and rabbit hunting groups can be found in Internet searches of "Wisconsin beagle clubs," Wisconsin dog field trial groups, and through the site Beagles Unlimited.

GREEN CAR WASHES

I was very pleased to read the article about car care in your February article on curbing runoff in towns ("Slow down in town," February 2003). As the owner of two self-service car washes, I educate customers about the benefits of using such washes. Not only is runoff controlled at commercial car washes, but also the water, detergents, gunk and grime go into a holding pit. The solids are collected regularly and disposed of by certified haulers. The water goes into a sanitary sewer where it can be properly treated before being released. Studies have also shown that people typically use less water washing cars at self-service car washes than when washing their cars at home with a garden hose.

Thanks for addressing the issue of car washing as it relates to our environment.

Chris Klar
McFarland

CONTROLLING POLLUTED RUNOFF

I enjoyed reading "Where the law meets the land," by Natasha Kassulke in the February issue. My father is a conservationist in Rusk County and fights issues like this every year that concern groundwater pollution and damage from runoff. Although I don't live in an urban area with lots of blacktop and concrete, our area has the same issues and I believe that public education about groundwater and

runoff management is needed. Many citizens don't know what is going on beneath their feet. Others may know, but don't understand the methods of going about managing these problems.

These new federal and state laws to curb runoff may help shape the future and I agree with Natasha that "We can change how cities and land look for the better."

Aaron Kunstmann
New Auburn

A MATTER OF SIZE

The April article "Teamwork on Wisconsin's northern coast" states Superior is the largest expanse of fresh water on Earth.

If expanse means surface area, that's true; if expanse means volume, not true. According to a 1996 DNR publication, Lake Baikal in Siberia holds more water than all five Great Lakes combined. I assume it is just a choice of words.

Toby E. Sherry
Madison

Indeed, we were describing surface area, which on Lake Superior is estimated between 82,100-83,300 square kilometers. Lake Baikal has a surface area of about 31,500 square kilometers, which is smaller than both lakes Huron and Michigan, but Baikal's incredible depths of up to 1,740 meters clearly means it holds more fresh water than any other lake. The deepest portions of Lake Superior are only about 400 meters.

We received a similar letter from Ralph Pleuss.

COMMENT ON A STORY?

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

UPDATES

ENERGY PLANS

The Wisconsin Environmental Initiative (WEI) won praise for its report, *Environmentally and Economically Sound Energy Strategies: Recommendations from the Energy Forum Working Group*, described by the Wisconsin State Journal as "a 30-page roadmap for lawmakers...that showed how it's possible for Wisconsin to have abundant supplies of electricity without sacrificing quality of life or relying on polluting technology." The report is available online at www.wi-ei.org/environmental_policy/energy_forum_report.pdf.

The report highlights many of the same issues raised in our December 2002 and February 2003 articles on energy innovation worth considering as Wisconsin plans future energy needs. A similar forum on developing sound environmental policies was hosted March 17th to explore ways to sustain both a healthy environment and robust economy.

BIRD/TOWER COLLISIONS

In March the Forest Conservation Council, Inc., American Bird Conservancy and Friends of the Earth filed suit in a federal appeals court stating that the Federal Communications Commission illegally approved communications towers that serve as death traps for millions of migratory birds (see our story "Battered by the airwaves," February 2000). The lawsuit claims 4-60 million birds die each year crashing into the country's 60,000 communications towers that are at least 200 feet high.

This particular suit focuses on 5,800 towers built on the Gulf Coast since 1996 on the 100 miles between Port Isabel, Texas to Tampa, Florida along a major bird migration route. Litigants said following U.S. Fish and Wildlife Service guidelines to keep towers lower than 200 feet, minimize lighting and support wires and avoiding siting towers in wetlands and floodplains could mitigate bird deaths.

Spokespersons for the Personal Communications Industry Association say the wires provide "safety and support," lighting must comply with federal aviation rules and both locations and tower heights aim to provide adequate cell phone coverage.

PBDE TESTING

The blood of 12 central Indiana mothers and their infants has relatively high levels of PBDEs, chemicals used in flame retardants, said researchers at Indiana University's School of Public and Environmental Affairs in a study released in March 2003. (See our February 2003 story "A smoldering issue.") The study released in Environmental Health Perspectives found that polybrominated diphenyl esters (PBDEs) were present in maternal and newborn blood at levels 20 or more times greater than those found in studies of Scandinavian mothers and infants. The Scandinavian studies sparked international research to document the spread of these flame retardant residues in air, water, soil and aquatic habitats.

Anchors aweigh

Do you think of “port” as a sweet wine, “bow” as what actors do on stage, “knots” as those things that kept shoes on your feet b.V. (before Velcro), “head” as what you find on top of a glass of beer, and “stern” as a description of your fourth-grade teacher’s face? Aye? Then please read on.

Clearly you have no concept of watercraft, and it’s likely the pleasures of boating have somehow escaped you even though Wisconsin has a couple thousand inland lakes and is bordered by two Great Ones. (And there’s the small matter of that very large river at our western boundary.)

If you’ve somehow never had the chance to enjoy Wisconsin’s waters from the water, fear not (unless you’re hydrophobic). Landlubbers do have options. Rides and tours on paddle-wheelers, pontoon boats, sailboats, excursion yachts, canoes and even tall ships await new sailors and old salts alike. Here are a few.

At the Milwaukee Municipal Pier, **Pier Wisconsin’s** 138-foot, three-masted schooner S/V *Denis Sullivan* stands ready to take you on a voyage of discovery into the world of 19th century Great Lakes sailing. The good ship Sullivan, named after a captain prominent in the early Great Lakes cargo shipping industry, offers three-hour day and evening sails in Lake Michigan. While aboard you can conduct water quality sampling and analysis; study Lake Michigan biological systems, including a zooplankton tow; or receive tips on general seamanship — like knot tying or handling block-and-tackle systems. If you have only an hour to spare, take the dockside deck tour for a quick dip into Wisconsin’s maritime history. Pier Wisconsin also offers longer overnight sailing adventures for adults and youth.

Visit www.pierwisconsin.org for more details or call (414) 276-7700.

Lake Superior’s spindrift draws many first-time sailors to the marinas of Bayfield. Several companies offer sailboat rides and charters that weave through the coves of the Apostle Islands. **Animaashi Sailing Company** (www.animaashi.com or call (715) 779-5468) welcomes you aboard the 34-foot sloop *Sarah’s Joy* for half-day, all-day or evening sails. On the 35-foot *Sandpiper* owned by **Sandpiper Classic Wooden Ketch**, you can take



the helm yourself with expert guidance from U.S. Coast Guard-trained Captain Craig Locoy (www.thimbleberryinn.com/piper.htm or call (800) 881-5903). **Dreamcatcher Sailing Charters** offers recreational cruises and instructional sails for all skill levels, beginning to advanced (www.wolfsonadventures.com/dreamcatcher/ or call (715) 779-5561).

Trade sails for pontoons and journey into the heart of Horicon — the nation’s largest cattail marsh — on daily tours offered by **Blue Heron Landing**. On Blue Heron’s two-hour pontoon birding tour, you’ll learn about wetland habitat and get pointers on how to identify bird species by sight and sound. A bird list is provided. Those who

Company’s Julia Belle Swain, one of only five steamboats still plying the Mississippi River. Although the main structure of the boat was built in 1971, its steam propulsion system with authentic vintage reciprocating engines hails from 1915. The steamboat’s pilot guides the craft through the Big River’s shoals and sandbars with a 7-



JOAN COLLINS PUBLICITY



CRAIG & SHARON LOCEY

Ahoy for adventure on the paddle-wheeler *Julia Belle Swain* in La Crosse or a sail through the Apostle Islands on the 35-foot Ketch *Sandpiper* in Bayfield.

foot antique teak pilotwheel, and passengers take their ease at a hand-carved wooden back bar. The *Julia Belle Swain* sidles through the reaches of the Upper Mississippi for one- and two-day excursions, Sunday morning brunch and evening dinner cruises; the steamboat departs from its dock at the levee in Riverside Park in downtown La Crosse. Visit www.juliabelle.com or call (608) 784-4882. ❧

prefer to go under their own power can take a guided and narrated canoe or kayak tour — or rent a canoe or kayak for private exploration. Tours depart from the bridge on Highway 33 in downtown Horicon. See www.blueheronlanding.com or call (920) 485-4663.

Put away the pontoons and stoke up the boiler for a ride on the **Great River Steamboat**

Wisconsin, naturally

PLAINFIELD TUNNEL CHANNEL LAKES STATE NATURAL AREA



Notable: This site has specialized habitat for one of our rarest plants, Fassett's locoweed (*inset*), named after UW botanist Norman Fassett who first described the species. This federally-threatened member of the bean family is "endemic" to Wisconsin; it grows here and nowhere else. It is adapted to sandy shores of shallow

seepage lakes whose shorelines fluctuate widely depending on rainfall and drought patterns. When the shore is exposed, locoweed seed germinates, grows, flowers (in late May), and drops new seeds. The plant requires open, sunny habitat and relies on periodic flooding to kill shade-producing trees that invade the shoreline. Locoweed seeds survive inundation — up to years at a time — by persisting in the lake bottom until water levels again drop. The natural area protects three lakes in a string of 13 lakes and ponds lying in a former "tunnel channel" created by a meltwater river flowing beneath glacial ice. The lake basins resulted from huge blocks of ice left buried when the tunnel collapsed.

How to get there: From the intersection of Highways 73 and BB on the east side of Plainfield, Waushara County, go east and south on 73 for 0.85 mile to a parking area west of the road. *Wisconsin Atlas*: page 53, grid C5.



TO SUBSCRIBE CALL 1-800-678-9472